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OPERABLE UNIT 5 REMEDIAL INVESTIGATION REPORT - VOLUME 5 OF 5 - APPENDICES E AND F - ***DRAFT FINAL*** - OCTOBER 1994

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REPORT

REMEDIAL INVESTIGATION REPORT FOR OPERABLE UNIT 5

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

VOLUME 5 OF 5

APPENDICES E AND F

OCTOBER 1994

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

DRAFT FINAL

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TABLE OF CONTENTS

List of Tables		v
List of Figures		vii
E.0	Introduction	E.0-1
E.1.0	Perched Groundwater	E.1-1
E.1.1	Radiological Parameters	E.1-1
E.1.1.1	Uranium Isotopes	E.1-1
E.1.1.2	Thorium Decay Series	E.1-6
E.1.1.3	Fission Products	E.1-10
E.1.1.4	Activation Products	E.1-13
E.1.2	Inorganic Parameters	E.1-14
E.1.2.1	Aluminum	E.1-14
E.1.2.2	Antimony	E.1-15
E.1.2.3	Arsenic	E.1-16
E.1.2.4	Barium	E.1-17
E.1.2.5	Beryllium	E.1-18
E.1.2.6	Cadmium	E.1-19
E.1.2.7	Calcium	E.1-20
E.1.2.8	Chromium	E.1-21
E.1.2.9	Cobalt	E.1-22
E.1.2.10	Copper	E.1-23
E.1.2.11	Cyanide	E.1-24
E.1.2.12	Iron	E.1-25
E.1.2.13	Lead	E.1-26
E.1.2.14	Magnesium	E.1-27
E.1.2.15	Manganese	E.1-28
E.1.2.16	Mercury	E.1-29
E.1.2.17	Molybdenum	E.1-30
E.1.2.18	Nickel	E.1-32
E.1.2.19	Potassium	E.1-33
E.1.2.20	Selenium	E.1-34
E.1.2.21	Silicon	E.1-35
E.1.2.22	Silver	E.1-36
E.1.2.23	Sodium	E.1-37
E.1.2.24	Thallium	E.1-38
E.1.2.25	Vanadium	E.1-39
E.1.2.26	Zinc	E.1-40

TABLE OF CONTENTS (Continued)

E.1.3 Organic Parameters E.1-41

E.1.3.1 Volatile Organic Compounds E.1-41
E.1.3.2 Semivolatile Organic Compounds E.1-45
E.1.3.3 Total Pesticides E.1-45
E.1.3.4 Total Dioxins and Furans E.1-46
E.1.3.5 Total Herbicides E.1-46
E.1.3.6 Total Organophosphorus Pesticides E.1-46

E.1.4 General Water Quality Parameters E.1-46

E.1.4.1 Alkalinity E.1-46
E.1.4.2 Ammonia E.1-47
E.1.4.3 Chloride E.1-47
E.1.4.4 Fluoride E.1-48
E.1.4.5 Nitrate E.1-49
E.1.4.6 pH E.1-50
E.1.4.7 Phenols E.1-51
E.1.4.8 Phosphorus E.1-52
E.1.4.9 Sulfate E.1-53
E.1.4.10 Total Organic Carbon E.1-54
E.1.4.11 Total Organic Halogens E.1-55
E.1.4.12 Total Organic Nitrogen E.1-56
E.1.4.13 Total Kjeldahl Nitrogen E.1-57

E.2.0 Great Miami Aquifer E.2-1

E.2.1 Radiological Parameters E.2-1

E.2.1.1 Uranium Isotopes E.2-1
E.2.1.2 Thorium Decay Series E.2-4
E.2.1.3 Fission Products E.2-8
E.2.1.4 Activation Products E.2-11

E.2.2 Inorganic Parameters E.2-13

E.2.2.1 Aluminum E.2-13
E.2.2.2 Antimony E.2-14
E.2.2.3 Arsenic E.2-14
E.2.2.4 Barium E.2-15
E.2.2.5 Beryllium E.2-16
E.2.2.6 Cadmium E.2-17
E.2.2.7 Calcium E.2-18
E.2.2.8 Chromium E.2-19

TABLE OF CONTENTS (Continued)

E.2.2.9 Cobalt E.2-20
E.2.2.10 Copper E.2-22
E.2.2.11 Cyanide E.2-23
E.2.2.12 Iron E.2-24
E.2.2.13 Lead E.2-26
E.2.2.14 Magnesium E.2-27
E.2.2.15 Manganese E.2-29
E.2.2.16 Mercury E.2-30
E.2.2.17 Molybdenum E.2-31
E.2.2.18 Nickel E.2-32
E.2.2.19 Potassium E.2-33
E.2.2.20 Selenium E.2-35
E.2.2.21 Silicon E.2-36
E.2.2.22 Silver E.2-37
E.2.2.23 Sodium E.2-39
E.2.2.24 Thallium E.2-40
E.2.2.25 Vanadium E.2-41
E.2.2.26 Zinc E.2-42

E.2.3 Organic Parameters E.2-43

E.2.3.1 Volatile Organic Compounds E.2-43
E.2.3.2 Semivolatile Organic Compounds E.2-44
E.2.3.3 Total Pesticides E.2-45
E.2.3.4 Total Dioxins and Furans E.2-45
E.2.3.5 Total Herbicides E.2-46
E.2.3.6 Organophosphorus Pesticides E.2-46

E.2.4 General Water Quality Parameters E.2-46

E.2.4.1 Alkalinity E.2-46
E.2.4.2 Ammonia E.2-47
E.2.4.3 Chloride E.2-47
E.2.4.4 Fluoride E.2-48
E.2.4.5 Nitrate E.2-48
E.2.4.6 pH E.2-49
E.2.4.7 Total Phenols E.2-49
E.2.4.8 Phosphorous E.2-50
E.2.4.9 Specific Conductivity E.2-51
E.2.4.10 Sulfate E.2-51
E.2.4.11 Total Organic Carbon E.2-52
E.2.4.12 Total Organic Halogens E.2-52
E.2.4.13 Total Organic Nitrogen E.2-53
E.2.4.14 Total Kjeldahl Nitrogen E.2-54

LIST OF TABLES

Table	Title
E.0-1	Background Data for Radionuclides and Chemicals in Perched Groundwater at the FEMP
E.0-2	Background Data for Radionuclides and Chemicals for Groundwater at the FEMP (Great Miami Aquifer)
E.1-1	Summary Statistics for FEMP Type 1 Wells
E.1-2	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area I
E.1-3	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area II
E.1-4	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area III
E.1-5	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area IV
E.1-6	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area V
E.1-7	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area VI
E.1-8	Summary Statistics for FEMP Type 1 Wells in Perched Groundwater Contamination Area VII
E.2-1	Summary Statistics for FEMP Type 2 Wells
E.2-2	Summary Statistics for FEMP Type 3 Wells
E.2-3	Summary Statistics for FEMP Type 4 Wells
E.2-4	Summary Statistics for FEMP Waste Storage Area A Plume Type 2 Wells
E.2-5	Summary Statistics for FEMP Waste Storage Area A Plume Type 3 Wells
E.2-6	Summary Statistics for FEMP Waste Storage Area A Plume Type 4 Wells
E.2-7	Summary Statistics for FEMP Waste Storage Area B Plume Type 2 Wells
E.2-8	Summary Statistics for FEMP Waste Storage Area B Plume Type 3 Wells
E.2-9	Summary Statistics for FEMP Waste Storage Area B Plume Type 4 Wells
E.2-10	Summary Statistics for FEMP Plant 6 Plume Type 2 Wells
E.2-11	Summary Statistics for FEMP Plant 6 Plume Type 3 Wells
E.2-12	Summary Statistics for FEMP Plant 6 Plume Type 4 Wells
E.2-13	Summary Statistics for FEMP South Plume A Type 2 Wells
E.2-14	Summary Statistics for FEMP South Plume A Type 3 Wells
E.2-15	Summary Statistics for FEMP South Plume A Type 4 Wells
E.2-16	Summary Statistics for FEMP South Plume B Type 2 Wells
E.2-17	Summary Statistics for FEMP South Plume B Type 3 Wells
E.2-18	Summary Statistics for FEMP South Plume B Type 4 Wells
E.2-19	Summary Statistics for FEMP South Plume C Type 2 Wells
E.2-20	Summary Statistics for FEMP South Plume C Type 3 Wells

LIST OF FIGURES

Figure	Title
E.0-1	Location of Potential Sources of Contamination - Operable Unit 5
E.1-1	Transformation Pathways for Various Chlorinated Volatile Hydrocarbons in Soil Systems

6161

E.0 INTRODUCTION

Sections 4.7 and 4.8 of this Remedial Investigation (RI) Report include a detailed presentation of uranium contamination based on groundwater samples analyzed for total uranium. Sections 4.7 and 4.8 also present summaries of the nature and extent of other FEMP contaminants. Appendix E provides descriptions of the nature and extent of individual parameters in perched groundwater (Section E.1) and the Great Miami Aquifer (Section E.2). This appendix is intended to be used like an encyclopedia, where readers of Sections 4.7 and 4.8 can find detailed discussions on individual parameters. The encyclopedic entries are written for readers who have read Sections 4.7 and 4.8.

The text of Appendix E includes few figures. The discussions of individual parameters reference the Plates volume of this report. Potential and known sources of contamination discussed below are presented in Figure E.0-1. A detailed discussion of Figure E.0-1 is included in Section 4.2.

Procedure Used to Generate Groundwater Isoconcentration Maps

The intent of the Plates is to present groundwater data and interpretive contours that represent groundwater conditions for a recent and constrained time period. The 1993 sampling programs are the most comprehensive data set constrained to a relatively short period. Consequently, the maps presented in the RI report are primarily based on the 1993 data set.

Though the 1993 data set is extensive, it does not have a concentration value for every parameter in every well. All wells required a data value in order to present maps and contours that accurately describe site conditions. If a well was not sampled during the 1993 data set period, a representative value was selected from the Operable Unit 5 database by choosing the chronologically latest maximum value in the database. In some cases the chronologically latest maximum value was a 1994 datum, but in most cases the chronologically latest datum predated the 1993 data set.

Pertinent points regarding the maps are

- Plates depicting perched groundwater data show data from Type 1 wells, Type 1 Hydropunch samples and Type 1 lysimeters.
- Three lysimeter locations have paired shallow and deep lysimeters. In these instances, only the data from the shallow lysimeters (11130, 11132, 11134), completed in the glacial

overburden, are shown; data from the deep lysimeters (11129, 11131, 11133), completed below the base of the glacial overburden, are not shown.

- Type 1 well data were contoured using data from all wells except:

1178	1180	1181	1183	1185	1188	1190	1194	1196	1199	1202
1203	1204	1205	1215	1221	1227	1231	1233	1250	1411	1780
1781	1783	1784	1785	11009						

These wells were omitted because it was not possible to fit all data on the E-size drawings used to generate the contours. However, data from these wells were included in perched groundwater summary statistics. All omitted wells are within the Plant 2/3 and pilot plant areas, where wells are numerous and closely spaced.

- Plates for Type 1 wells show all groundwater and leachate data within other Operable Unit boundaries; however, contours stop at the edges of below-grade waste units. The only exception to this is total uranium in the South Field area of Operable Unit 2, where isoconcentration contours are portrayed through the waste units.

- Plates for Type 2, 3 and 4 wells show data collected from wells only. Total uranium data collected with a Hydropunch during the drilling of Types 2, 3 and 4 wells are portrayed on cross sections in Section 4.8.1 (Figures 4-102 to 4-111).

- Plates for Types 2, 3 and 4 wells show data from within other Operable Unit boundaries, and contours are drawn continuous beneath waste units of other Operable Units.

- Contours were generated by hand to best portray estimated plume shapes in terms of known groundwater flow directions and known or suspected sources.

- Solid contour lines indicate specific parameter concentrations. For reference, each plate also shows 5 and 20 μg/L, dashed contour lines for total uranium.

- Contour maps of total uranium and isotopic uranium were drawn based on the assumption that uranium isotopes occur in natural concentrations. Isoconcentration lines representing an isotope of uranium do not cross lines representing total uranium at a lower concentration. For example, the 20 μg/L total uranium line is equivalent to a uranium-238 level of approximately 6.6 pCi/L. Thus the 5 pCi/L contour on the uranium-238 groundwater maps is outside the 20 μg/L total uranium line, and the 10 pCi/L uranium-238 line is inside the 20 μg/L total uranium line. Similar logic was used for the other uranium isotopes.

- Each datum was selected from data for a given year according to the following search criteria. Validated data were searched first. If data with validated qualifiers were not available, nonvalidated data were used. The selection criteria were as follows. Select the maximum concentration from "-" qualified data; if no "-" qualified data were available, then the maximum J qualified datum was selected; if no J qualified datum was available, then the maximum UJ qualified datum as selected; etc., . . . where the relative preferences of data were ranked "-" > J > UJ > U > NV > UNV > R.

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- The plates distinguish 1993 data from non-1993 data by showing 1993 data in parentheses with the qualifier outside the parentheses, e.g., (72.5)NV.

- Types 3 and 4 well data are plotted on the same plate. Only Type 3 well data were contoured. Type 4 well data are in italics and are not contoured because of the small number of data points.

- The plates portray concentrations and data qualifiers for each well. Appendix T contains tabulated data files for each plate. For reference, each table lists the parameter, sample number, sample date, boring number, coordinates (northing and easting), and result for data presented on each plate. The tables depicting Type 1 data include the data for the 28 Type 1 wells that are not shown on the plates.

- The maps of Type 1 well data show data collected from within the boundaries of other operable units. The maps present such data for illustrative purposes only, and the data is not used in Operable Unit 5 fate and transport modeling or risk assessment.

Procedure Used to Generate Summary Statistics Tables

Summary statistics Tables E.1-1 to E.1-8 and E.2-1 to E.2-21 are intended to numerically illustrate the occurrence of each parameter within distinct geographic well groups. For instance, Table E.1-1 summarizes the nature and extent of contamination in Type 1 wells site-wide, while Tables E.1-2 to E.1-8 summarize the nature and extent of contamination for seven geographically distinct contamination areas.

The values used to calculate statistics were chosen by the same process used to choose values for groundwater concentration maps (described above). In the case of Type 2, Type 3 and Type 4 wells, the sample set used to calculate statistics is the set of values presented on the concentration maps (Plates E-77 to E-152). As was described above, it was impossible to show a small set of production area wells on the Type 1 groundwater concentration maps (Plates E-1 to E-76). However, the values not shown on the concentration maps are included in the sample set used to calculate statistics. Consequently, comparisons of Type 1 groundwater concentration maps with Type 1 statistical summaries that include production area wells (Tables E.1-1 and E.1-2) will yield similar but not identical conclusions.

The statistical summary tables compare each site sample set to a background value if one is available for a parameter (Tables E.0-1 and E.0-2). The background value used here is the 95th percentile calculated for the background sample set, as presented in the Characterization of Background Water Quality for Streams and Groundwater (DOE 1994a). An example calculation of the 95th percentile is

shown in Appendix A.II.0. The 95th percentile of the background sample set is the value below which 95 percent of the background sample set falls.

For each parameter, the tables list the number of wells with detectable concentrations greater than the 95th percentile of background. The occurrence of an above-background value for a well does not necessarily indicate that groundwater is contaminated. In many cases, it is probable that measured "above-background" values represent natural conditions. This is particularly likely for some cases where the concentration is elevated less than two times the background value and the monitoring well is not located near a potential source of contamination. The encyclopedic discussions of individual parameters presented in E.1 and E.2 point out individual cases where above-background values are assumed to represent natural conditions.

Nonrepresentative Wells

The following Great Miami Aquifer wells are considered to be nonrepresentative of aquifer conditions due to poor construction, anomalous geologic strata, or suspect events in the history of the well. The wells are not included in the summary statistics for groundwater.

- Well 2393. The well was installed in 1990; however, no volclay grout was used to seal the annulus. The top of the well screen is approximately 10 feet below the ground surface. Most analytical results from the well appear to be consistent with trends in neighboring wells; however, one validated groundwater sample showed anomolously high concentrations for multiple parameters. Parameter values for the well are not shown in the maps and the values are not included in summary statistics for Type 2 wells.

- Well 2754. The well was completed in clay on the north edge of the Great Miami Aquifer, and has occasionally been observed to go dry. The well is in a location that is upgradient of known and suspected sources of contamination; however, the well consistently yields above-background concentrations for multiple parameters. The well is believed to be nonrepresentative of Great Miami Aquifer groundwater, because it is completed in clay (most of the other Great Miami Aquifer wells are completed in sand and gravel strata. The clay is potentially responsible for locally anomalous groundwater chemistry. Parameter values for the well are shown in the maps; however, the values are not included in summary statistics for Type 2 wells.

- Well 3009. The well has had anomolously high concentrations of inorganic parameters. The high concentrations are not considered representative of true Great Miami Aquifer conditions, because surrounding wells do not corroborate the data. The well was constructed in 1965 with steel riser pipe and a brass screen. Video surveys of the well in 1989 and 1990 revealed the presence of heavy scale in the well and debris in the bottom of the well. Parameter values for the well are shown in the maps; however, the values are not included in summary statistics for Type 3 wells.

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- Well 41240. The flush-mount well was discovered in 1992. The well was investigated at that time and discovered to contain a large quantity of debris. No other information about the well is available. The well was plugged and abandoned in 1993. Parameter values for the well are shown in the maps; however, the values are not included in summary statistics for Type 4 wells.

- Well 4013. The well was installed in 1989 as part of the Operable Unit 5 RI. Four wells in the cluster were plugged and abandoned in 1991, because of poor joints observed in the riser pipes. Well 4013 was not plugged and abandoned because it postdated the other wells and was believed to be in sound condition. The analytical results from Well 4013 show anomalous variation and anomolously high concentrations, given information from surrounding wells and known/suspected source areas. Parameter values for the well are shown in the maps; however, the values are not included in summary statistics for Type 4 wells.

TABLE E.0-1

BACKGROUND DATA FOR RADIONUCLIDES AND CHEMICALS IN PERCHED GROUNDWATER AT THE FEMP

	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Radionuclides (pCi/L)								
Cesium-137	NA	0/13	NA	ND	NA	Undefined	NA	ND
Neptunium-237	NA	3/10	NA	0.043 - 0.25	NA	Undefined	NA	0.25
Plutonium-238	NA	1/13	NA	0.075	NA	Undefined	NA	0.075
Plutonium-239/240	NA	0/19	NA	ND	NA	Undefined	NA	ND
Radium-226	1/4	9/22	0.9	0.14 - 0.9	Undefined	Lognormal	0.9	0.9
Radium-228	1/4	4/22	2.2	1.9 - 5.2	Undefined	Undefined	2.2	3
Ruthenium-106	NA	0/13	NA	ND	NA	Undefined	NA	ND
Strontium-90	NA	1/16	NA	2.0	NA	Undefined	NA	2.0
Technetium-99	1/4	2/26	30	30 - 49.3	Undefined	Undefined	30	30
Thorium-228	1/2	11/24	0.1	0.23 - 1.62	Undefined	Lognormal	0.1	1.6
Thorium-230	0/4	11/25	ND	0.14 - 2.0	Undefined	Lognormal	ND	1.3
Thorium-232	0/3	3/14	ND	0.2 - 0.34	Undefined	Undefined	ND	0.34
Uranium-234	1/1	9/13	0.6	0.25 - 1.1	Undefined	Normal	0.6	0.9
Uranium-235/236	0/2	0/13	ND	ND	Undefined	Undefined	ND	ND
Uranium-238	A	9/13	A	0.23 - 0.99	A	Normal	A	0.8

TABLE E.0-1 (Continued)

	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Radionuclides (μg/L)								
Thorium, Total	NA	1/10	NA	3.1	NA	Undefined	NA	3.1
Uranium, Total	2/3	8/15	1.0 - 1.4	0.48 - 1.5	Undefined	Normal	1.4	1.3
Inorganics (mg/L)								
Aluminum	3/7	2/5	0.0375 - 0.123	0.774 - 2.29	Undefined	Undefined	0.123	2.29
Antimony	2/4	0/2	0.0141 - 0.0272	ND	Undefined	Undefined	0.0272	ND
Arsenic	5/17	3/5	0.0042 - 0.122	0.0031 - 0.0194	Undefined	Undefined	0.122	0.0194
Barium	22/23	5/5	0.034 - 0.452	0.0486 - 0.454	Undefined	Undefined	0.451	0.454
Beryllium	2/6	0/4	0.001 - 0.0018	ND	Undefined	Undefined	0.0018	ND
Cadmium	2/22	0/4	0.006 - 0.007	ND	Undefined	Undefined	0.006	ND
Calcium	25/25	5/5	74.4 - 155	81.1 - 172	Lognormal	Undefined	131	172
Chromium	8/24	1/5	0.006 - 0.0345	0.0046	Undefined	Undefined	0.034	0.0046
Cobalt	0/7	0/5	ND	ND	Undefined	Undefined	ND	ND
Copper	4/23	3/5	0.013 - 0.03	0.0053 - 0.0294	Undefined	Undefined	0.019	0.0294
Cyanide	0/4	0/5	ND	ND	Undefined	Undefined	ND	ND
Iron	18/25	5/5	0.0467 - 4.9	0.249 - 6.35	Undefined	Undefined	3.58	5.5
Lead	6/17	3/4	0.0014 - 0.0087	0.0013 - 0.0016	Undefined	Undefined	0.0087	0.0016
Magnesium	25/25	5/5	20.4 - 47.8	23.1 - 50.7	Lognormal	Undefined	47.8	50.7
Manganese	19/23	4/5	0.0025 - 0.22	0.0035 - 0.205	Lognormal	Undefined	0.18	0.205
Mercury	1/22	0/5	0.0004	ND	Undefined	Undefined	0.0004	ND
Molybdenum	2/20	0/4	0.017 - 0.028	ND	Undefined	Undefined	0.017	ND

TABLE E.0-1 (Continued)

	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Nickel	4/24	1/5	0.021 - 0.026	0.0072	Undefined	Undefined	0.022	0.0072
Potassium	21/23	4/5	0.891 - 31.5	0.963 - 17.2	Lognormal	Undefined	29.3	17.2
Selenium	0/16	0/5	ND	ND	Undefined	Undefined	ND	ND
Silicon	4/4	4/4	5.62 - 7.43	5.6 - 10.7	Undefined	Undefined	7.43	10.7
Silver	5/25	1/5	0.0105 - 0.052	0.0031	Undefined	Undefined	0.04	0.0031
Sodium	23/23	5/5	5.71 - 56.3	8.81 - 50	Lognormal	Undefined	56.3	50
Thallium	0/5	0/5	ND	ND	Undefined	Undefined	ND	ND
Vanadium	2/7	1/5	0.018 - 0.0195	0.0051	Undefined	Undefined	0.0195	0.0051
Zinc	5/7	4/5	0.0104 - 0.0443	0.0192 - 0.352	Undefined	Undefined	0.0443	0.352
General Water Quality Parameters (mg/L)								
Alkalinity	NA	5/5	NA	313 - 430	NA	Undefined	NA	430
Ammonia	NA	11/22	NA	0.1 - 4.5	NA	Undefined	NA	4.3
Chloride	NA	20/25	NA	1.4 - 50	NA	Undefined	NA	45
Fluoride	NA	25/25	NA	0.2 - 1.3	NA	Lognormal	NA	1.3
Nitrate	NA	9/11	NA	0.012 - 0.3	AN	Normal	NA	0.29
Nitrate/Nitrite	NA	1/4	NA	0.07	NA	Undefined	NA	0.07
Phenols	NA	11/21	NA	0.007 - 0.03	NA	Lognormal	NA	0.03
Phosphate	NA	1/1	NA	0.191	NA	Undefined	NA	0.191
Phosphorous	NA	12/20	NA	0.026 - 0.18	NA	Lognormal	NA	0.18
Sulfate	NA	22/25	NA	3 - 175	NA	Normal	NA	136
Sulfide	NA	0/4	NA	ND	NA	Undefined	NA	ND

TABLE E.0-1 (Continued)

	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
TKN[a]	NA	10/14	NA	0.178 - 4.34	NA	Undefined	NA	4.34
TOC[b]	NA	4/7	NA	1.15 - 9	NA	Undefined	NA	9
TOX[c]	NA	3/16	NA	0.011 - 0.126	NA	Undefined	NA	0.126
TON[d]	NA	10/20	NA	0.1 - 1.35	NA	Undefined	NA	0.34
Total Solids	NA	1/1	NA	452	NA	Undefined	NA	452
Total Dissolved Solids	1/1	NA	433	NA	Undefined	NA	433	NA
Field Parameters								
Dissolved Oxygen	NA	22/22	NA	1 - 9.2	NA	Lognormal	NA	9.2
pH (Standard Units)	NA	29/20	NA	6.9 - 7.7	NA	Lognormal	NA	7.5
Specific Conductivity (μmhos/cm)	NA	30/30	NA	470 - 1170	NA	Lognormal	NA	955

[a]Total Kjeldahl Nitrogen
[b]Total Organic Carbon
[c]Total Organic Halogens
[d]Total Organic Nitrogen
A - Analyzed but data not useable. See "Characterization of Background Water Quality for Streams and Groundwater," Appendix C for description of data quality.
ND - Not Detected
NA - Not Analyzed

TABLE E.0-2

BACKGROUND DATA FOR RADIONUCLIDES AND CHEMICALS FOR GROUNDWATER AT THE FEMP (GREAT MIAMI AQUIFER)

Constituents	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Radionuclides (pCi/L)								
Cesium-137	0/1	2/70	ND	5.8 - 6.7	Undefined	Undefined	ND	5.8
Neptunium-237	1/1	4/81	0.12	0.25 - 0.62	Undefined	Undefined	0.120	0.25
Plutonium-238	0/1	6/62	ND	0.022 - 0.089	Undefined	Undefined	ND	0.048
Plutonium-239/240	1/1	5/59	0.042	0.016-0.083	Undefined	Undefined	0.042	0.05
Radium-226	10/11	56/105	0.20 - 2	0.071 - 2	Normal	Lognormal	1.90	1.5
Radium-228	0/13	23/106	ND	1.0 - 52	Undefined	Undefined	ND	3.6
Ruthenium-106	1/1	0/76	ND	ND	Undefined	Undefined	ND	ND
Strontium-90	0/1	4/87	ND	0.65 - 4.8	Undefined	Undefined	ND	0.65
Technetium-99	0/1	2/99	ND	22 - 26	Undefined	Undefined	ND	22
Thorium-228	4/10	37/101	0.2 - 0.4	0.075 - 2.9	Undefined	Undefined	0.4	0.77
Thorium-230	2/11	44/98	0.1 - 0.29	0.18 - 2.5	Undefined	Lognormal	0.29	0.89
Thorium-232	3/11	9/71	0.1 - 0.3	0.1 - 0.77	Undefined	Undefined	0.3	0.23
Uranium-234	9/11	65/98	0.23 - 0.9	0.14 - 1.3	Normal	Lognormal	0.9	0.8
Uranium-235/236	0/10	5/97	ND	0.094 - 0.26	Undefined	Undefined	ND	0.094
Uranium-238	9/11	42/104	0.23 - 0.9	0.14 - 0.93	Normal	Lognormal	0.9	0.64

TABLE E.0-2 (Continued)

Constituents	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Radionuclides (μg/L)								
Thorium, Total	NA	3/50	NA	0.97 - 2.1	NA	Undefined	NA	0.97
Uranium, Total	10/12	69/115	0.1 - 0.8	0.1 - 3.1	Normal	Undefined	0.8	1.2
Inorganics (mg/L)								
Aluminum	11/27	4/15	0.062 - 0.175	0.06 - 0.225	Lognormal	Undefined	0.175	0.225
Antimony	0/10	0/11	ND	ND	Undefined	Undefined	ND	ND
Arsenic	27/89	7/16	0.002 - 0.55	0.0011 - 0.0294	Undefined	Undefined	0.26	0.0294
Barium	97/110	14/16	0.021 - 0.82	0.0368 - 0.768	Undefined	Lognormal	0.669	0.768
Beryllium	6/23	0/16	0.001 - 0.0023	ND	Undefined	Undefined	0.0022	ND
Cadmium	16/106	3/16	0.002 - 0.01	0.0022 - 0.0135	Undefined	Undefined	0.006	0.0135
Calcium	110/111	16/16	63.6 - 181	78 - 162	Lognormal	Lognormal	136	159
Chromium	35/111	2/16	0.008 - 0.0441	0.0067 - 0.0211	Undefined	Undefined	0.03	0.0211
Cobalt	0/23	1/15	ND	0.0086	Undefined	Undefined	ND	0.0086
Copper	31/110	2/16	0.01 - 0.176	0.011 - 0.035	Undefined	Undefined	0.083	0.0354
Cyanide	01/12	0/16	ND	ND	Undefined	Undefined	ND	ND
Iron	74/111	14/15	0.007 - 5.42	0.312 - 5.5	Undefined	Normal	4.14	5.72
Lead	13/79	1/15	0.0016 - 0.029	0.002	Undefined	Undefined	0.009	0.002
Magnesium	111/111	16/16	15.7 - 46	20.1 - 39	Lognormal	Normal	37.8	38.5
Manganese	83/106	16/16	0.002 - 0.916	0.0043 - 0.904	Undefilned	Lognormal	0.78	0.904
Mercury	10/104	0/15	0.0002 - 0.001	ND	Undefined	Undefined	0.0004	ND

TABLE E.0-2 (Continued)

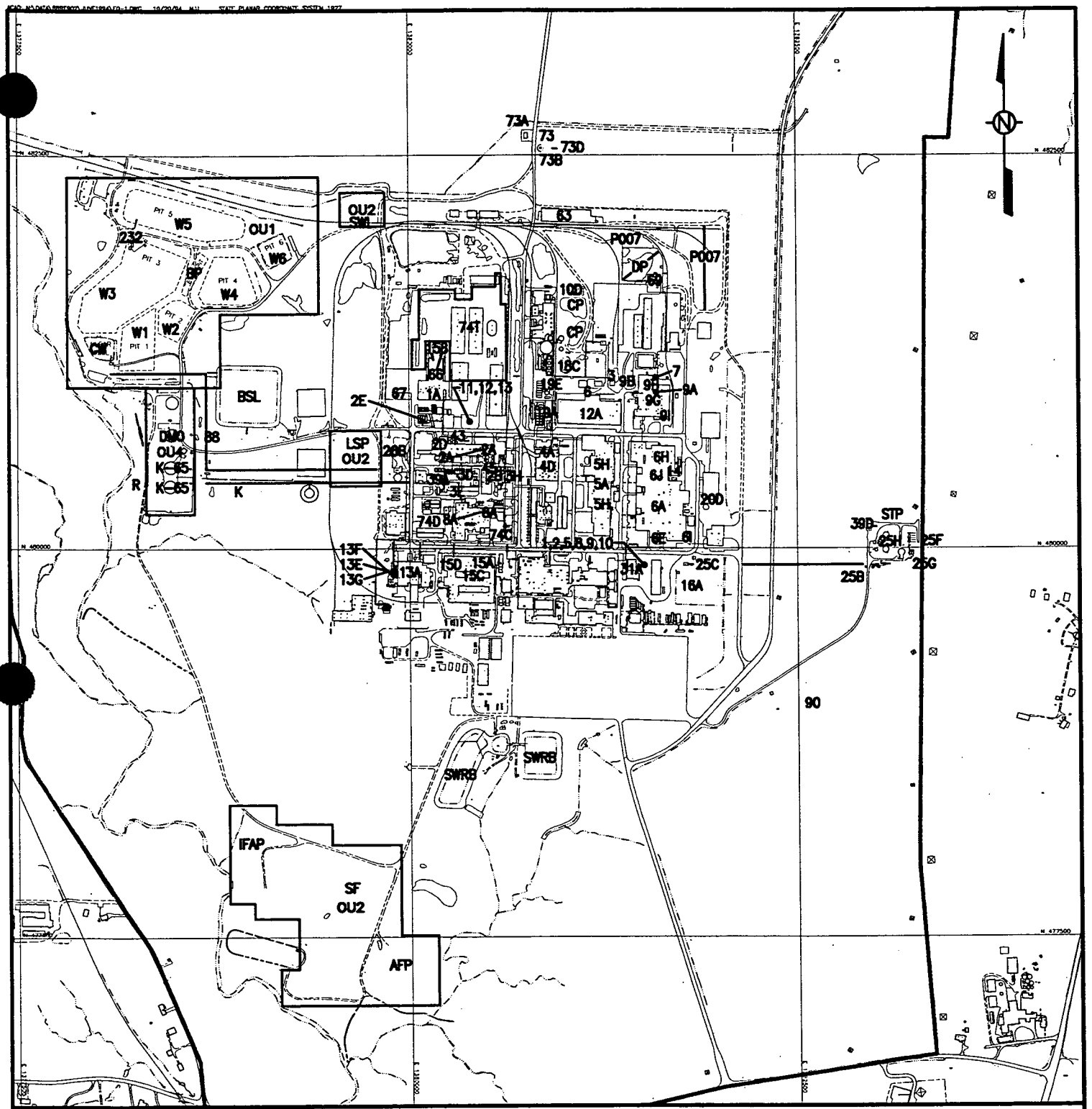
Constituents	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Molybdenum	21/90	0/8	0.004 - 0.04	ND	Undefined	Undefned	0.025	ND
Nickel	14/111	1/16	0.012 - 0.0279	0.0514	Undefined	Undefined	0.023	0.0514
Potassium	94/101	13/16	0.664 - 4.03	0.648 - 1.96	Lognormal	Lognormal	3.32	1.96
Selenium	6/79	1/15	0.00105 - 0.006	0.00075	Undefined	Undefined	0.004	0.00075
Silicon	4/4	1/1	2.6 - 3.46	5.81	Undefined	Undefined	3.46	5.81
Silver	13/110	1/16	0.0031 - 0.034	0.0117	Undefined	Undefined	0.0138	0.0117
Sodium	106/106	16/16	1.96 - 101	3.08 - 50.4	Lognormal	Normal	55.0	47.2
Thallium	0/16	0/15	ND	ND	Undefined	Undefined	ND	ND
Vanadium	12/27	2/16	0.01 - 0.0244	0.0076 - 0.0117	Undefined	Undefined	0.0234	0.0117
Zinc	10/23	2/14	0.0068 - 0.133	0.0087 - 0.021	Undefined	Undefined	0.0568	0.021
General Water Quality Parameters (mg/L)								
Alkalinity	NA	21/21	NA	210 - 430	NA	Normal	NA	422
Ammonia	NA	40/101	NA	0.045 - 12.6	NA	Undefined	NA	4.2
Chloride	NA	98/110	NA	0.02 - 120	NA	Undefined	NA	73
Fluoride	NA	110/113	NA	0.1 - 1.9	NA	Lognormal	NA	0.89
Nitrate	NA	52/64	NA	0.014 - 24.9	NA	Undefined	NA	11.4
Nitrate/Nitrite	NA	4/12	NA	0.02 - 4.1	NA	Undefined	NA	4.1
Phenols	NA	46/94	NA	0.00575 - 0.091	NA	Undefined	NA	0.03
Phosphorous	NA	75/102	NA	0.01 - 3.08	NA	Undefined	NA	0.954
Sulfate	NA	101/110	NA	2.79 - 321	NA	Undefined	NA	197

TABLE E.0-2 (Continued)

Constituents	Frequency of Detection		Range of Detection		Distribution		95th Percentile	
	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Sulfide	NA	0/6	NA	ND	NA	Undefined	NA	ND
TKN[a]	NA	38/53	NA	0.1 - 4.74	NA	Lognormal	NA	3.3
TOC[b]	NA	17/25	NA	1 - 4.25	NA	Normal	NA	2.23
TOX[c]	NA	13/85	NA	0.012 - 0.12	NA	Undefined	NA	0.052
TON[d]	NA	61/86	NA	0.075 - 2.75	NA	Undefined	NA	0.9
Total Solids	NA	18/18	NA	330 - 773	NA	Lognormal	NA	711
Total Dissolved Solids	20/20	NA	320 - 673	NA	Normal	NA	658	NA
Dissolved Oxygen	NA	93/93	NA	0.1 - 10.4	NA	Lognormal	NA	7.84
pH (Standard Units)	NA	131/131	NA	6.3 - 7.9	NA	Normal	NA	7.7
Specific Conductivity (μmhos/cm)	NA	131/131	NA	370 - 1890	NA	Lognormal	NA	928

[a]Total Kjeldahl
[b]Total Organic Carbon
[c]Total Organic Halogens
[d]Total Organic Nitrogen

ND Not Detected
NA Not Analyzed



LEGEND:

UNDERGROUND STORAGE TANKS

1 TANK 1, GASOLINE, REMOVED
2 TANK 2, GASOLINE, REMOVED
3 TANK 3
4 TANK 4
5 TANK 5
6 TANK 6
7 TANK 7
8 TANK 8, GASOLINE REMOVED
9 TANK 9, DIESEL, REMOVED
10 TANK 10, GASOLINE & KEROSENE, REMOVED
11 TANK 11, GASOLINE & KEROSENE, REMOVED
12 TANK 12, GASOLINE, REMOVED
13 TANK 13, GASOLINE & KEROSENE, REMOVED
14 TANK 14, VIRGIN WATER-SOLUBLE MACHINE COOLING OIL

OPERABLE UNIT 1

W1 WASTE PIT 1
W2 WASTE PIT 2
W3 WASTE PIT 4 (HWMU 233)
W4 WASTE PIT 3 (HWMU 234)
W5 WASTE PIT 5
CW CLEARWELL
BP BURN PIT
232 EXPERIMENTAL TREATMENT FACILITY ("GREENHOUSE" HWMU 232)

OPERABLE UNIT 2

AFP ACTIVE FLYASH PILE
IAP INACTIVE FLYASH PILE
LSP LIME SLUDGE PONDS
SF SOUTH FIELD
SWL SOLID WASTE LANDFILL

OPERABLE UNIT 3

1A PREPARATION PLANT
2A ORE REFINERY PLANT (INCLUDES HWMU 41 UNH TANKS)
2B GENERAL SUMP REFINERY SUMP CONTROL BUILDING
2D METAL DISSOLVER BUILDING
2E NFS UNH TANKS (HWMU 42)
2F NAN TOWERS
3C HOT RAFFINATE BUILDING (INCLUDES HWMU 44 UNH TANKS)
3H REFINERY SUMP
4A GREEN SALT PLANT
4D KEY SUMPS
5A METALS PRODUCTION PLANT
5H KEY SUMPS
6A METALS FABRICATION PLANT
6E SALT-OIL HEAT TRACING
6H WATER TREATMENT
6I SCRAP METAL PICKLING
6J SLUG PICKLING AREA
7A UF_6 TO UF_4 REDUCTION PLANT

OPERABLE UNIT 3, CONT.

8A SCRAP RECOVERY PLANT
INCLUDES: HWMU 65 BOX FURNANCE
HWMU 66 OXIDATION FURNANCE
HWMU 80 PRIMARY CALCINER
8A SPECIAL PRODUCTS PLANT
8B SUMP TREATMENT
8C SUMP AND 2000LD PROCESS AREA
8H SUMP
9I 4700 GALLON SUMP
10D OIL BURNER/GRAPHITE BURNER PAD
12A MAINTENANCE BUILDING
13A PILOT PLANT WET SIDE
13E MAIN SUMP
13F SOLVENT STORAGE
13G TANK FARM
15A LABORATORY
15C SUMP
15D FORMER DRUM STORAGE
16A MAIN ELECTRICAL SUBSTATION
18C COAL PILE RUNOFF BASIN
19A MAIN TANK FARM
19E SUMP (HWMU 203)
20D WATER TOWER SANDBLASTING RESIDUE
25B EFFLUENT LINE
25C SEWAGE LIFT STATION
25F SLUDGE DRYING BEDS (HWMU 224)
25G CLARIFIER BASINS
25H TRICKLING FILTERS

OPERABLE UNIT 3, CONT.

26B WATER TOWER SANDBLASTING RESIDUE
31A ENGINE HOUSE/GARAGE
38A TRANS INCINERATOR (HWMU 40)
39D INCINERATOR
43 UNH TANKS (HWMU 43)
63 KC-2 WAREHOUSE
66 DRUM RECONDITION BUILDING
67 PLANT 1 THORIUM WAREHOUSE (HWMU 11)
69 FORMER DECONTAMINATION BUILDING
73 FIRE TRAINING AREA (HWMU 183)
73A TRAINING BUILDING
73B BURN POND AND DRAIN PIT
73D BURN TROUGH
74C PLANT 8 EAST DRUM STORAGE PAD (HWMU 87)
74D PLANT 8 WEST DRUM STORAGE PAD (HWMU 88)
74T PLANT 1 STORAGE PAD
88 CLEARWELL LINE
138 WHEELABORATOR (HWMU 158)
BSL BIO-SURGE LAGOON (HWMU 223)
CP COAL PILE
DP DECONTAMINATION PAD
K K-65 SLURRY LINE
P007 OUTSIDE EQUIPMENT STORAGE AREAS
STP SEWAGE TREATMENT PLANT

OPERABLE UNIT 4

K-65 (INCLUDES SUBGRADE DECANT TANK)
DMO : DRY METAL OXIDE SILO

OPERABLE UNIT 5

R RUBBLE PILE
90 TRAP RANGE

SCALE
0 400 800 FEET

NOTE: SEE FIGURE 4-4 FOR SAME INFORMATION AT A LARGER SCALE

FIGURE E.0-1
LOCATION OF POTENTIAL SOURCES OF CONTAMINATION
OPERABLE UNIT 5

DRAFT
FINAL

E.1.0 PERCHED GROUNDWATER

E.1.1 RADIOLOGICAL PARAMETERS

E.1.1.1 Uranium Isotopes

Uranium has four isotopes that are found at the FEMP due to its production history: uranium-234, uranium-235, uranium-236, and uranium-238. These isotopes have identical chemical behavior; however, their specific activities and abundances vary. In natural uranium, uranium-238 accounts for 99.3 weight percent of the total uranium. The percentage is even greater in depleted uranium. In natural uranium, uranium-234 yields about the same activity concentration as uranium-238. Uranium-235, in nature, has an activity concentration approximately 1/20 that of uranium-238. This lower activity concentration makes uranium-235 more difficult to detect and quantify at background levels. Uranium-236 is only created in a nuclear reactor through uranium activation reactions and thus would not be expected to be found in large quantities at the FEMP. Analytical techniques used at the FEMP could not distinguish between uranium-235 and uranium-236 so these isotopes are reported together.

Uranium-238 in unfiltered samples has a 95th percentile background value of 0.80 pCi/L, and background values range from 0.23 to 0.99 pCi/L (Table E.0-1). A background value for uranium-238 in filtered samples was not determined. Uranium-234 in unfiltered samples has a 95th percentile background value of 0.90 pCi/L and a range of background values from 0.25 to 1.1 pCi/L. Uranium-234 in filtered samples has a 95th percentile background value of 0.6 pCi/L, determined from one detection in a background sample. Uranium-235/236 was not detected in background samples above the detection limit. This is probably because the analytical method did not have the sensitivity necessary to measure the low levels of uranium-235/236 expected in background perched groundwater. Any detection of uranium-235/236 is considered an above-background concentration for unfiltered or filtered samples.

Plates E-1 and E-2 are isoconcentrations maps of total uranium in unfiltered and filtered samples, from the 1993 data set. Plates E-3 and E-4 are isoconcentration maps of the maximum total uranium in unfiltered and filtered samples, from the entire data set (1988 to 1993). These maps shows essentially the same extent of uranium contamination as total uranium from the 1993 data set (Plates E-1 and E-2). Plates E-5 and E-6 are isoconcentration maps of uranium-238 for unfiltered and filtered samples, respectively. Plates E-7 and E-8 are isoconcentration maps of uranium-234 for

unfiltered and filtered samples, respectively. Additionally, Plates E-9 and E-10 are isoconcentration maps of uranium-235/236 for unfiltered and filtered samples, respectively. The maps are based on results from the 1993 data set. Contours represent areas of elevated uranium concentrations.

In the perched groundwater, uranium generally tends to form negatively charged uranium complexes which have a low sorption capacity. Thus, when uranium is analyzed in both unfiltered and filtered samples, the samples generally indicate similar results; unlike many other positively charged inorganic and radiological parameter which sorb more readily on clay- and silt-size particles, and thus show higher concentrations in the unfiltered samples. However, wells were not always sampled for both unfiltered and filtered samples. Thus, isoconcentration maps do not always appear to indicate a similar extent of contamination in the perched groundwater. Therefore, it is useful to examine both unfiltered and filtered samples when interpreting the uranium data.

Total uranium is the sum of the concentrations of each of the isotopic analyses. In natural or depleted uranium, uranium-238 is the most abundant isotope on a mass basis, although uranium-234 has about the same activity as uranium-238. Because most of the material processed at the FEMP contained either natural or depleted uranium, the isoconcentration maps for uranium-238 and uranium-234 should be relatively consistent with that of total uranium. A comparison of the isoconcentration maps for uranium-238 and uranium-234 with total uranium shows this to be true (Plates E-1, E-2, E-5, E-6, E-7, and E-8). A detailed discussion of the distribution of total uranium at the FEMP is presented in Section 4.7.1.

A comparison of the isoconcentration map of uranium-235 with those of uranium-238 or total uranium shows that the uranium-235 isoconcentration map still identifies the areas of peak contaminant concentrations near the sources (Plates E-9, E-10, E-5, E-6, E-1, E-2). Due to its lower relative concentration, however, the areal extent of the uranium-235 appears to be smaller. Since the uranium-235 cannot be separated from the uranium-238 via chemical means, the presence of uranium-238 in groundwater infers the presence of uranium-235, even if the uranium-235 concentration is too low to quantify by analytical means.

Thorium-230

While thorium-230 behaves chemically like thorium-232 and thorium-228, it is otherwise unrelated to these isotopes. Thorium-230 is a progeny of uranium-238 and is found as a natural constituent of

uranium-bearing ores, while the other thorium isotopes are part of the thorium decay chain and unrelated to uranium. Thorium-230 was left in the raffinate during the extraction of uranium from ores (pitchblende) and uranium concentrates. Thus, it was an anticipated constituent in those areas used to handle, process or store raffinates from the FEMP refinery, such as Plant 2/3.

Thorium-230 in unfiltered samples has a 95th percentile background value of 1.3 pCi/L and background values that range from 0.14 to 2.0 pCi/L (Table E.0-1). Thorium-230 was not detected in filtered samples collected to determine background; consequently, any detection of thorium-230 is considered an above-background concentration for filtered samples.

Thorium-230 was detected in unfiltered samples at above-background values in 38 of 192 wells (20 percent) and had a maximum value of 28 pCi/L; thorium-230 was detected in filtered samples in 45 of 148 wells (30 percent) and had a maximum value of 24.3 pCi/L (Table E.1-1).

Plates E-11 and E-12 are isoconcentration maps of thorium-230 concentrations in unfiltered and filtered perched groundwater samples, respectively, thorium-230 was detected at above-background concentrations in three principal areas around the production area. One of these areas is Plant 2/3, where concentrations in unfiltered samples, as high as 28 pCi/L were found in Well 1784 (this well location is not portrayed on the isoconcentration maps). The Plant 2/3 area received raffinate slurries from other areas of the production area for treatment and filtration. Raffinates from processing ores and uranium concentrates contained the highest concentrations of thorium-230. Lower concentrations, 2-12 pCi/L of thorium-230, were found in unfiltered perched groundwater from other wells located in the Plant 2/3 area. These areas were used for the digestion (dissolution in nitric acid) of uranium-bearing ores and residues before processing in the extraction area. Throughout its history, the Plant 2/3 area was used to dissolve materials containing elevated concentrations of thorium-230. Thus, the presence of thorium-230 is consistent with process knowledge.

High concentrations of thorium-230 in the production area were also detected below Plant 6. Well 1161 had concentrations as high as 24.3 pCi/L from a filtered sample. Other wells near and to the south of Plant 6 also had above-background concentrations of thorium-230 at values from near background to 4.2 pCi/L. Thorium-230 was also detected in two wells south of Plant 6 in the unfiltered samples. Concentrations in Wells 1172 and 1173 were 2.1 pCi/L from non-validated samples which are below two times background. Various activities in Plant 6, including scrap metal

pickling and slug pickling involved materials containing elevated concentrations of thorium-230. Again, the presence of thorium-230 is consistent with process knowledge.

Thorium-230 was also detected at high levels near Plant 1. The highest concentration in unfiltered samples of thorium-230 was 6.9 pCi/L detected in Well 1343 located at the Plant 1 storage pad. A second well located in the immediate vicinity, 1339, yielded a concentration of 2.2 pCi/L. The Plant 1 storage pad was used to store containers of radioactive materials, including raffinates which would be expected to contain thorium-230.

Thorium-230 was found in perched groundwater from six distinct areas outside the production area. Well 1952, located south of the FEMP solid waste landfill yielded unfiltered groundwater concentrations as high as 13.8 pCi/L. The presence of thorium-230 combined with elevated concentrations of uranium in this area indicate the potential disposal of uranium concentrates or raffinates in the landfill. Above-background values of thorium-230 were also detected in the waste pit area. The highest concentration, 24.6 pCi/L, was observed in perched groundwater collected from Well 1644 located between the burn pit and Waste Pit 4 (DOE 1994g). Perched groundwater in this area was addressed in the Operable Unit 1 RI Report.

Monitoring Well 11085, located immediately east of the South Field, yielded unfiltered a thorium-230 concentration of 11.2 pCi/L. This is consistent with measurements taken from another well (1942) in the immediate vicinity. Perched water sampled from this well contained a thorium-230 concentration of 3.9 pCi/L. The origin of these contaminants is addressed as part of the Operable Unit 2 RI Report (DOE 1994b).

Monitoring Wells 1508 and 1887 near the fire training area had thorium-230 values of 3.4 and 1.6 pCi/L, respectively. Contaminated oils were used here when training fire fighters.

Perched groundwater wells in two additional areas yielded low but above background concentrations of thorium-230. These include the area around the sewage lift station (25C), which processes sanitary sewage before discharge to the Great Miami River, and the drum baling area. The thorium-230 concentrations in perched groundwater obtained from these areas did not exceed two times background.

Radium-226

Radium-226 behaves chemically like radium-228 but is otherwise unrelated to it. Radium-226 is a progeny of uranium-238 and as such can be found at the FEMP as a constituent in raffinate that remains after the extraction of uranium. Radium-226 also occurs naturally in perched groundwater.

Radium-226 in unfiltered samples has a 95th percentile background value of 0.90 pCi/L and background values that range from 0.14 to 0.90 pCi/L (Table E.0-1). Radium-226 in filtered samples has a 95th percentile background value of 0.90 pCi/L. Radium-226 was detected in only one filtered sample collected to determine background.

Radium-226 was detected in unfiltered samples at above-background concentrations in 86 of 195 wells (44 percent) and had a maximum concentration of 35.8 pCi/L (Table E.1-1). Radium-226 was detected in filtered samples at above-background concentrations in 21 of 152 wells (14 percent) and had a maximum concentration of 16.6 pCi/L. Thus, radium-226 was detected less frequently in filtered samples relative to unfiltered samples. This observation is consistent with trends seen in most of the other radiological and inorganic parameters.

Plates E-13 and E-14 are isoconcentration maps of radium-226 concentrations in unfiltered and filtered perched groundwater samples, respectively, based on the 1993 data set. Broad areas are observed where wells displayed concentrations above background. The largest area encompasses an expanse beneath Plant 2/3, Plant 8, and part of Plant 1. Additionally, the adjacent area below the laboratory and pilot plant have above-background concentrations. The highest concentration in these areas is 16.6 pCi/L from an isolated detection in a filtered sample from Well 1182. While most of the southwest quadrant of the production area shows concentrations only slightly above background in unfiltered samples, two focal areas are observed where concentrations exceed 5 pCi/L. Well 1179 near the metal dissolver building (2D) showed a concentration of 6.4 pCi/L and wells in the vicinity of the hot raffinate building showed concentrations as high as 5.8 pCi/L. Radium-226 may have entered the subsurface as a dissolved component of acid solutions or waste water that was spilled on floors or leaked from sumps and below-grade piping.

Another large area where radium-226 is observed above background in unfiltered samples from multiple adjacent wells, is in the vicinity of Plant 6, where the maximum concentration was detected in Well 1152. Contamination in this area may have been released to the perched groundwater via

leaks from Sump 5 and subsurface pipes near the scrap metal slag pickling facility (6J). Radium-226 was also detected in multiple adjacent wells near the waste pits; concentrations ranged from 1.4 to 2.6 pCi/L. In the northeastern production area, radium-226 was detected in samples from multiple wells in concentrations that ranged from 1.1 to 8.3 pCi/L. The maximum concentration was detected in Well 11230 (8.3 pCi/L) located near the drum bailing area.

The maximum observed concentration of radium-226 was in Well 1892 (35.8 pCi/L) near the K-65 silos. Other areas where radium-226 occurred at concentrations above background were: fire training area (73), where the maximum concentration was in Well 1513 at 4.5 pCi/L; sewage treatment plant where the maximum concentration was 2.7 pCi/L; and the South Field where maximum concentration was at 3.2 pCi/L. Radium-226 was also found in Well 1952 near the solid waste landfill at 5.11 pCi/L.

Elevated concentrations of radium-226 from isolated wells throughout the site suggest that radium-226 contamination is due to site activities; however, detections which are less than two times background may be due to the natural variability in background concentration.

E.1.1.2 Thorium Decay Series

Total Thorium

Isoconcentration maps of total thorium concentrations in unfiltered and filtered perched groundwater samples from FEMP Type 1 wells are presented in Plates E-17 and E-18, respectively.

Total thorium is a measurement of the quantity of thorium in a sample without distinguishing between thorium's three principal isotopes, thorium-232, thorium-230, and thorium-228. Thorium-230 and thorium-228 have very high specific activities (rates of radioactive decay) relative to thorium-232. Therefore, total thorium is largely a measurement of thorium-232 (Plates E-15 and E-16), because thorium-230 and thorium-228 are only a small weight fraction of total thorium at the FEMP. Discrepancies between the total thorium isoconcentration maps (E-17 and E-18) and the thorium-232 maps (E-15 and E-16) are due to differences in the detection limits for each analysis, and in the number wells samples for each analysis.

Thorium-232

Thorium-232 in unfiltered samples has a 95th percentile background concentration of 0.34 pCi/L and background values that range from 0.2 to 0.34 pCi/L (Table E.0-1). Thorium-232 was not detected in filtered samples collected to determine background; consequently, any detection of thorium-232 is considered an above-background concentration for filtered samples.

Thorium-232 was detected in unfiltered samples at above-background concentrations in 53 of 192 wells (28 percent) and had a maximum concentration of 11.5 pCi/L; thorium-232 was detected in filtered samples at above-background concentrations in 14 of 147 wells (10 percent) and had a maximum concentration of 10 pCi/L (Table E.1-1). Thus, thorium-232 was detected less frequently in filtered samples relative to unfiltered samples. This observation is consistent with trends seen in most of the other inorganic and radiological parameters.

Plates E-15 and E-16 are isoconcentration maps of thorium-232 concentrations in unfiltered and filtered perched groundwater samples, respectively, based on the 1993 data set. Plates E-15 and E16 show that elevated concentrations of thorium-232 in perched groundwater are localized and isolated.

The highest concentration of thorium-232 in perched groundwater was 11.5 pCi/L detected in Well 1952 located just south of the solid waste landfill. High thorium-232 concentrations were also detected in Well 1149 (11.3 pCi/L) located below Plant 6. Adjacent wells in this area also have thorium-232 concentrations above two times background. Another area where thorium-232 was detected at concentrations greater than two times background was below Plant 2/3, where the highest concentration is in Well 1212 (4.2 pCi/L). Thorium-232 was also detected in multiple adjacent wells south of Plant 6 near the heavy equipment building; however, these concentrations are from nonvalidated samples.

Isolated monitoring wells yielded elevated concentrations of thorium-232 above two times background in the unfiltered data. They included: Well 1934 (2.6 pCi/L) located on the south side of the lime sludge ponds; Well 1195 (3.4 pCi/L) and Well 1232 (3.3 pCi/L) located in the Plant 2/3 area; and Well 1508 (2.8 pCi/L) located in the fire training area.

In the filtered data, elevated concentrations of thorium-232 above two times background were detected in isolated wells near: the fire training area (Well 1890 at 1.2 pCi/L); near Plant 2/3 (Well 1226 at 1.0 pCi/L); and below Plant 6 (Well 1148 at 10 pCi/L).

Radium-228

Radium-228 in unfiltered samples has a 95th percentile background concentration of 3.0 pCi/L and background values that range from 1.9 to 5.2 pCi/L (Table E.0-1). Radium-228 in filtered samples has a 95th percentile background concentration of 2.2 pCi/L. Background was determined on only one filtered sample.

Radium-228 was detected in unfiltered samples at above-background concentrations in 32 of 190 wells (17 percent) and had a maximum concentration of 219 pCi/L; radium-228 was detected in filtered samples at above-background concentrations in 26 of 153 wells (17 percent) and had a maximum concentration of 16 pCi/L (Table E.1-1). Thus, radium-228 was detected less frequently in filtered samples relative to unfiltered samples. This observation is consistent with trends seen in most of the other radiological and inorganic parameters.

Plates E-19 and E-20 are isoconcentration maps of radium-228 concentrations in unfiltered and filtered perched groundwater samples, respectively, based on the 1993 data set. Radium-228, a progeny of thorium-232, was found in unfiltered samples at concentrations greater than two times background in perched water. The maximum concentration detected in the unfiltered samples was from Well 1148 (219 pCi/L) located below Plant 6. Detections in multiple adjacent wells were observed northeast of the Plant 1 pad. The maximum concentration detected here was 8.7 pCi/L in Well 1336.

Radium-228 was detected at above two times background in unfiltered groundwater samples from a few isolated wells throughout the site including Well 1786 (14.4 pCi/L) near the Plant 9 sump (9I); Well 1892 (23.7 pCi/L) near the K-65 silos; and Well 1733 (6.4 pCi/L) southeast of the production area. Some of these are >10 times background. This cannot be attributed to natural variation.

Concentrations of radium-228 greater than two times background were found in multiple wells in the filtered samples with the maximum concentration found in Well 1161 (16 pCi/L). Adjacent wells (1152 and 1160) near Plant 6 also had elevated filtered concentrations of 7.2 and 6.5 pCi/L,

respectively. A second area where radium-228 was also detected in multiple adjacent wells was near Waste Pit 6 (W6) with the maximum concentration found in Well 1080 (10.4 pCi/L). Other isolated detections of radium-228 were observed in the waste pit area.

Radium-228 was detected at above two times background in filtered groundwater samples from a few isolated wells throughout the site including: Well 1425 (10.1 pCi/L) near the Plant 9 sump (9I); Well 1332 (8.5 pCi/L) near the KC-2 warehouse; Well 1010 (9.0 pCi/L) just west of the Plant 1 pad; Well 1008 (11.5 pCi/L) south of the biodenitrification surge lagoon (BSL); and Well 1523 (5.5 pCi/L) south of the pilot plant.

Thorium-228

Thorium-228 in unfiltered samples has a 95th percentile background value of 1.6 pCi/L and background values that range from 0.23 to 1.62 pCi/L (Table E.0-1). Thorium-228 in filtered samples has a 95th percentile background value of 0.1 pCi/L. Background for filtered samples was determined from only one sample.

Thorium-228 was detected in unfiltered samples at above-background concentrations in 19 of 192 wells (10 percent) and had a maximum concentration of 14 pCi/L (Table E.1-1). Thorium was detected in filtered samples at above-background concentrations in 22 of 146 wells (15 percent) and had a maximum concentration of 10 pCi/L. As is typical of most other inorganic and radiological parameters analyzed for at the FEMP, thorium-228 was detected at lower concentrations in filtered samples than in unfiltered samples.

Plates E-21 and E-22 are isoconcentration maps of thorium-228 concentrations in unfiltered and filtered perched groundwater samples, respectively, based on the 1993 data set. Thorium-228 is a progeny of thorium-232 and so the occurrence of thorium-228 is associated with the presence of thorium-232. Isolated occurrences of thorium-228 above three times background in unfiltered samples of perched groundwater were observed in the production area. The maximum concentration of thorium-228 was in Well 1952 (14 pCi/L) at the south edge of the solid waste landfill. Thorium-228 was also detected in Well 1197 near Plant 2/3 at 6.0 pCi/L and Well 1161 near the Plant 6 slug pickling area (6J) at 5.3 pCi/L. Thorium-232 was also detected in these same general areas.

Thorium-228 was observed above 1 pCi/L in filtered samples in six isolated wells within the production area including two wells below Plant 6. Thorium-228 was also detected in two wells in the Plant 2/3 area, Well 1154 (1.0 pCi/L) and Well 1242 (2.6 pCi/L). The maximum concentration was detected in Well 1148 (10.0 pCi/L) below Plant 6. Thorium-228 in filtered samples was also detected in one well near the wastes pits, Well 1836 (1.3 pCi/L).

E.1.1.3 Fission Products

Strontium-90

Strontium-90 in unfiltered samples has a 95th percentile background concentration of 2.0 pCi/L (Table E.0-1). Strontium-90 was detected in only one unfiltered background sample. Filtered background samples were not analyzed for strontium-90; consequently, any detection is considered an above-background concentration for filtered samples (Table E.0-1.)

Strontium-90 was detected in unfiltered samples at above-background concentrations in 7 of 112 wells (6 percent) and had a maximum concentration of 7.68 pCi/L (Table E.1-1). Strontium-90 was detected in filtered samples in 9 of 49 wells (18 percent) and had a maximum concentration of 5 pCi/L (Table E.1-1).

Strontium-90 is a fission product which entered the FEMP as part of the feed materials from reactor returns. Strontium-90 was not found at substantially elevated concentrations and associated production activities were not wide-spread across the FEMP. Plates E-23 and E-24 are isoconcentration maps of unfiltered and filtered perched groundwater samples, respectively, based on the 1993 data set. Strontium-90 was detected at above-background concentrations in unfiltered groundwater samples in adjacent wells near the waste pits where the maximum detection was in Well 1076 (5.3 pCi/L).

Strontium-90 was also detected in a few isolated wells throughout the production area at above-background concentrations in the unfiltered groundwater. The maximum strontium-90 detection was in Well 1149 (7.68 pCi/L) near the Plant 6 slug pickling area (6J). Strontium-90 was also detected in Well 1042 (3.5 pCi/L) near the lime sludge ponds.

Strontium-90 was detected in filtered samples at concentrations greater than 1 pCi/L from six isolated wells throughout the site. Strontium-90 was detected just west of Plant 7 in Wells 1150 and 1154

(3.6 and 3.19 pCi/L, respectively). Strontium-90 was detected in filtered samples from Well 1148 (5.0 pCi/L) near the Plant 6 slug pickling area (6J) and from Well 1838 (1.32 pCi/L) near the waste pits. Well 11068 (1.2 pCi/L) near the K-65 silos and Well 11032 (1.33 pCi/L) near the South Field also had elevated concentrations of strontium-90.

Elevated concentrations in isolated wells suggests that strontium-90 contamination may be due to site activities; however, measurements which are near both the background levels and the analytical detection limit may be inaccurate or represent background variations.

Technetium-99

Like strontium-90, technetium-99 is a fission product created in nuclear reactors. Technetium-99 entered the FEMP as a contaminant in reactor returns (i.e., uranium returned for further processing after it has been exposed in a nuclear reactor and reprocessed to remove the majority of highly radioactive fission and reactor products). The reactor returns entered the FEMP as feed material. Processing of the feed material in the refinery to purify the uranium would have left most of the technetium-99 in the raffinate. Technetium-99 contamination may be in those areas used to handle, process or store raffinate.

Technetium-99 in unfiltered samples has a 95th percentile background concentration of 30 pCi/L and background values that range from 30 to 49.3 pCi/L (Table E.0-1). Technetium-99 in filtered samples has a 95th percentile background concentration of 30 pCi/L. Background was established for filtered data from one sample.

Technetium-99 was detected in unfiltered samples at above-background concentrations in 55 of 170 wells (32 percent) and had a maximum concentration of 6130 pCi/L; technetium-99 was detected in filtered samples at above-background concentrations in 45 of 138 wells (33 percent) and had a maximum concentration of 2670 pCi/L (Table E.1-1). Technetium-99 generally forms a negatively charged oxide complex which does not sorb well on the perched aquifer material. Therefore, the filtered data is considered representative of technetium-99 contamination and the following discussion focuses on the filtered data.

Plates E-25 and E-26 are isoconcentration maps of technetium-99 in unfiltered and filtered perched groundwater samples, respectively, based on the 1993 data set. High concentrations of technetium-99

were, as anticipated, found in the vicinity of Plant 2/3 where refinery operations were conducted. Other areas with elevated technetium-99 concentrations included Waste Pit 6 (W6) and two wells just west of the BSL. The maximum concentration in each of these three areas is 1680 pCi/L in Well 1236, 81.4 pCi/L in Well 1082, and 248 pCi/L in Well 1836.

Elevated concentrations of technetium-99, up to 2130 pCi/L, were also found beneath Plants 6 and 9 near the metal pickling areas. These facilities were not used to handle, process or store raffinates. It is likely that the uranium extraction process was not fully effective in removing technetium-99 from uranium-bearing feed materials and the resultant uranium metal product of the FEMP also contained technetium-99 contamination.

Other areas which exhibited elevated concentrations of technetium-99 in filtered samples include: the sewage treatment plant (maximum detection in Well 1444 of 1610 pCi/L) which, until the late 1980s, processed liquid effluent from the general sump before discharge to the Great Miami River; the fire training area (63.1 pCi/L)); two wells at the north end of the Plant 1 storage pad with a maximum of 68.2 pCi/L; and two isolated detections in Well 11071 (60.8 pCi/L) west of the Plant 1 storage pad and in Well 1869 (52.9 pCi/L) south of the service building. Other isolated detections were no greater than 35 pCi/L.

Cesium-137

Cesium-137 was not detected in unfiltered background samples, and was not analyzed for in filtered background samples; consequently, any detection in unfiltered and filtered samples was considered an above-background concentration. Cesium-137 was detected in filtered samples in 4 of 49 wells (8 percent) and had a maximum concentration of 20 pCi/L (Table E.1-1). Cesium-137 was detected in unfiltered samples from 4 of 114 (4 percent), also with a maximum concentration of 20 pCi/L (Well 1012, south of the K-65 silos).

Plate E-27 is a isoconcentration map of cesium-137 concentrations in filtered perched groundwater samples based on the 1993 data set. Cesium-137 was detected only in a few filtered groundwater samples from isolated wells throughout the site: in Well 1779 (20 pCi/L) near Plant 2/3 (this well is not shown on the map); in Well 1148 (20 pCi/L) near the Plant 6 slug pickling area; in Well 1890 (20 pCi/L) near the fire training area; and in Well 11067 (5.70 pCi/L) near the sewage treatment plant. These were isolated detections and nearby wells did not have elevated detections of cesium.

Ruthenium-106

Forty-one filtered and 109 unfiltered perched groundwater samples from FEMP Type 1 wells were analyzed for ruthenium-106. None of the perched groundwater samples yielded a positive detection.

E.1.1.4 Activation Products

Plutonium

Plutonium was introduced to the FEMP as a contaminant in uranium recycle materials.

The table of plutonium-238 and plutonium-239/240 concentrations in perched groundwater each show positive detections of plutonium at levels less than or equal to 1.0 pCi/L (Table E.1-1).

Plate E-28 is an isoconcentration map of plutonium-239/240 in filtered perched groundwater samples based on the 1993 data set. Plates E-29 and E-30 are contour maps of plutonium-238 concentrations in unfiltered and filtered perched groundwater respectively.

Plutonium-239/240 was detected in the following wells in filtered and unfiltered samples: Well 1148 (1.0 pCi/L) below Plant 6; Well 1167 (0.5 pCi/L) near Plant 7; Well 1779 (1.0 pCi/L well not shown on map), Well 1783 (1 pCi/L well not shown on map) and Well 1784 (1 pCi/L well not shown on map) near Plant 2/3; and Well 1890 (1.0 pCi/L) near the fire training area.

Plutonium-238 was detected in Monitoring Well 1890 (1.0 pCi/L) by the fire training area, Well 1148 (1.0 pCi/L) located in Plant 6, Wells 1213 (0.9130 pCi/L), 1779 (1.0 pCi/L well not shown on map), 1783 (1 pCi/L well not shown on map), 1784 (1 pCi/L well not shown on map) located near Plant 2/3, and Well 1842 (0.7437) near Plant 6.

The measured plutonium concentrations were all at low levels near the analytical detection limit. All of the data were qualified as estimated or could not be validated. Consequently, the data may be inaccurate and are not necessarily indicative of plutonium contamination.

Neptunium-237

Neptunium-237 in unfiltered perched groundwater samples had a 95th percentile background value of 0.25 pCi/L, and background values range from 0.043 to 0.25 pCi/L (Table E.0-1). No analyses were

performed for neptunium-237 in filtered background samples so any detection is considered an above-background concentration.

Neptunium-237 was detected in unfiltered samples at above-background concentrations in 1 of 106 wells (< 1 percent); with a concentration of 0.625 pCi/L in Well 1887, located near the fire training area (Table E.1-1). Neptunium-237 was detected in filtered samples in 7 of 36 wells (19 percent) and had a maximum concentration of 1.97 pCi/L.

Plate E-31 is an isoconcentration map of neptunium-237 concentrations in filtered perched groundwater samples based on the 1993 data set. Detections of neptunium-237 were observed in the vicinity of the K-65 silos, Plant 7, Plant 6, and near the fire training area. The maximum detection of neptunium-237 was in Well 1167 (1.97 pCi/L) near Plant 7.

E.1.2 INORGANIC PARAMETERS

Contours represent areas of elevated concentrations.

E.1.2.1 Aluminum

Aluminum in filtered samples has a 95th percentile background concentration of 0.123 mg/L and background values that range from 0.0375 to 0.123 mg/L (Table E.0-1). Aluminum in unfiltered samples has a 95th percentile background concentration of 2.29 mg/L and background values that range from 0.774 to 2.29 mg/L.

Aluminum was detected in filtered samples at above-background concentrations in 42 of 196 wells (21 percent) and had a maximum concentration of 10.4 mg/L; aluminum was detected in unfiltered samples at above-background concentrations in 102 of 174 wells (59 percent) and had a maximum concentration of 470 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, aluminum was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plates E-32 and E-33 are contour maps of aluminum concentrations in filtered and unfiltered perched groundwater samples, respectively, based on the 1993 data set.

Aluminum was detected at above-background concentrations in filtered groundwater samples in multiple adjacent wells at the fire training area (73) and below Plant 6 with maximum concentrations in Well 1148 (2.9 mg/L) and Well 1149 (4.6 mg/L), respectively. Aluminum detections also occurred in isolated wells throughout the site; e.g., at ≥30 times background in Well 1357 (10.40 mg/L) near the NFS UNH tanks (2E), Well 1786 (4.55 mg/L) near the Plant 9 sump (9I), and Well 1443 (3.48 mg/L) near the sewage treatment plant.

Data from unfiltered samples suggest large plumes of aluminum contamination in the perched groundwater across the entire site (Plate E-33). However, aluminum is a primary constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of aluminum in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples from multiple adjacent wells and isolated wells suggest that aluminum contamination is due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentration.

E.1.2.2 Antimony

Antimony in filtered samples has a 95th percentile background concentration of 0.0272 mg/L and background values that range from 0.0141 to 0.0272 mg/L (Table E.0-1). Antimony was not detected in unfiltered samples collected to determine background; consequently, any detection of antimony is considered an above-background concentration for unfiltered samples.

Antimony was detected in filtered samples at above-background concentrations in 19 of 192 wells (10 percent) and had a maximum concentration of 0.0987 mg/L; antimony was detected in unfiltered samples in 21 of 173 wells (12 percent) and had a maximum concentration of 0.135 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, antimony was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plates E-34 and E-35 are contour maps of antimony concentrations in filtered and unfiltered perched groundwater samples, respectively, based on the 1993 data set.

Antimony was detected at above-background concentrations in filtered groundwater samples in multiple adjacent wells in only one area near the K-65 silos; a maximum concentration of 0.099 mg/L was measured in Well 1615 near the silos. Antimony was also detected above background in isolated wells near the waste pits and Plant 2/3; concentrations in these areas range from a minimum of 0.051 mg/L to a maximum of 0.077 mg/L in Well 1080 near the waste pits.

Unfiltered groundwater samples show elevated detections of antimony in only a few wells throughout the site; detections occur near the waste pits and Plant 2/3 and south of the fire training area. Maximum concentrations of antimony were detected in Well 1332 (0.135 mg/L) and Well 1645 (0.079 mg/L).

Elevated concentrations in filtered samples from multiple adjacent wells suggest a plume of antimony present in the perched groundwater near the K-65 silos. Additionally, antimony detections from wells near the waste pits and near Plant 2/3 are probably also due to site activities; however, detections that are less than two times background value may be due to the natural variability in background concentration.

E.1.2.3 Arsenic

Arsenic in filtered samples has a 95th percentile background concentration of 0.122 mg/L and background values that range from 0.0042 to 0.122 mg/L (Table E.0-1). Arsenic in unfiltered samples has a 95th percentile background concentration of 0.0194 mg/L and background values that range from 0.0031 to 0.0194 mg/L.

Arsenic was detected in filtered samples at above-background concentrations in 1 of 202 wells (0.5 percent) at a concentration of 0.191 mg/L; arsenic was detected in unfiltered samples at above-background concentrations in 7 of 174 wells (4 percent) and had a maximum detected concentration of 0.432 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, arsenic was detected less frequently and at lower concentrations in filtered samples relative to unfiltered samples.

Plate E-36 is a map of arsenic concentrations in filtered perched groundwater based on the 1993 data set. Arsenic was detected above background in one well in the filtered perched groundwater. This well is located in the waste pit area (Well 1644) and has a value of 0.191 mg/L.

Unfiltered data show arsenic detections in two wells located in the waste pit area. Wells 1024 and 1644 have arsenic concentrations of 0.069 and 0.313 mg/L, respectively. Arsenic was also detected above background in Wells 1189 and 1229 (0.101 and 0.023 mg/L, respectively) near Plant 2/3. The highest concentration in the unfiltered data was in Well 1342 (0.432 mg/L); however, this is a nonvalidated sample.

Elevated concentrations in filtered samples from wells in the waste pit area and wells in the unfiltered perched groundwater near Plant 2/3 are due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentration.

E.1.2.4 Barium

Barium in filtered samples has a 95th percentile background concentration of 0.451 mg/L and background values that range from 0.034 to 0.452 mg/L (Table E.0-1). Barium in unfiltered samples has a 95th percentile background concentration of 0.454 mg/L and background values that range from 0.0486 to 0.454 mg/L.

Barium was detected in filtered samples at above-background concentrations in 2 of 202 wells (1 percent) and had a maximum concentration of 0.589 mg/L; barium was detected in unfiltered samples at above-background concentrations in 5 of 174 samples (86 percent) and had a maximum detected concentration of 3.35 mg/L (Table E.1-1). As is typical of most inorganic parameters analyzed for at the FEMP, barium was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-37 is a map of barium concentrations in filtered perched groundwater based on the 1993 data set. Barium was detected in the filtered groundwater samples at Well 1149 (0.589 mg/L) and Well 1021 (0.486 mg/L).

Barium was also detected at above-background concentrations in five wells in the unfiltered groundwater samples. These were isolated detections and nearby wells did not have elevated concentrations of barium. Because barium is a constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles, barium detected at above background in unfiltered samples is probably due to high turbidity. Elevated concentrations in unfiltered samples are not conclusive indicators of elevated dissolved

contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in two filtered samples may be due to site activities; however, these detections are less than twice background and may be due to the natural variability in background concentrations.

E.1.2.5 Beryllium

Beryllium in filtered samples has a 95th percentile background concentration of 0.0018 mg/L and background values that range from 0.001 to 0.0018 mg/L (Table E.0-1). Beryllium was not detected in unfiltered samples collected to determine background; consequently, any detection of beryllium is considered an above-background concentration for unfiltered samples.

Beryllium was detected in filtered samples at above-background concentrations in 13 of 192 wells (7 percent) and had a maximum concentration of 0.0343 mg/L (Table E.1-1). Beryllium was detected in unfiltered samples in 30 of 173 wells (17 percent) and a maximum detected concentration of 0.0231 mg/L. As is typical of most inorganic parameters analyzed for at the FEMP, beryllium was detected less frequently in filtered samples than in unfiltered samples.

Plate E-38 is a contour map of beryllium concentrations in filtered perched groundwater samples based on the 1993 data set. Beryllium was detected in filtered groundwater in a few isolated wells at concentrations greater than two times background. Beryllium was detected in Wells 1148, 1149, and 1181 below Plant 6 at 0.005, 0.034, and 0.013 mg/L, respectively; in Well 1786 below Plant 9 at 0.006 mg/L; and in Wells 1213 and 1232 below Plant 2/3 at 0.004 and 0.006 mg/L, respectively.

Unfiltered data suggest small plumes of beryllium contamination in the perched groundwater below Plant 2/3, in the vicinity of Plants 6 and 9 and the fire training area. However, beryllium is found as a trace constituent in the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The higher concentrations of beryllium in many of the unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples from isolated wells suggest that beryllium contamination is due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentrations.

E.1.2.6 Cadmium

Cadmium in filtered samples has a 95th percentile background concentration of 0.006 mg/L and background values that range from 0.006 to 0.007 mg/L (Table E.0-1). Cadmium was not detected in unfiltered samples collected to determine background; consequently, any detection of cadmium is considered an above-background concentration for unfiltered samples.

Cadmium was detected in filtered samples at above-background concentrations in 17 of 202 wells (8 percent) and had a maximum concentration of 0.05 mg/L; cadmium was detected in unfiltered samples in 39 of 174 wells (22 percent) and a maximum detected concentration of 0.07 mg/L (Table E.1-1). As is typical of most inorganic parameters analyzed for at the FEMP, cadmium was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-39 is a contour map of cadmium concentrations in filtered perched groundwater samples based on the 1993 data set. Cadmium was detected in adjacent wells near the waste pit area at above-background concentrations in filtered groundwater (Wells 1078, 1075 and 1025) with a maximum concentration of 0.050 mg/L, which is about eight times background. Cadmium was also detected at above-background concentrations in four wells near the K-65 silos (Wells 1032, 1615, 1617, and 1618) at a maximum concentration of 0.023 mg/L in Well 1615. Cadmium was also detected in two wells below Plant 6 (Wells 1149 and 1161) with a maximum concentration of 0.040 mg/L in Well 1149.

Detections of cadmium occurred in isolated wells at above-background concentrations in filtered groundwater samples in Well 1232 below Plant 2/3 (0.011 mg/L) Well 1124 northeast of the production area (0.007 mg/L), Well 1287 near the coal pit (0.007 mg/L), and Well 1053 near the pilot plant (0.007 mg/L).

Data from unfiltered samples suggest cadmium contamination in many isolated wells across the entire site. However, cadmium is found as a trace constituent in the natural soil matrix, and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The

larger apparent extent and higher concentrations of cadmium in the unfiltered samples are probably due to the higher turbidity in the unfiltered samples and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicators of groundwater conditions.

Elevated concentrations in filtered samples from wells near the waste pits, the K-65 silos, and Plant 6, suggest that cadmium contamination is due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentrations.

E.1.2.7 Calcium

Calcium in filtered samples has a 95th percentile background concentration of 131 mg/L and background values that range from 74.4 to 155 mg/L (Table E.0-1). Calcium in unfiltered samples has a 95th percentile background concentration of 172 mg/L and background values that range from 81.1 to 172 mg/L.

Calcium was detected in filtered samples at above-background concentrations in 95 of 204 wells (47 percent) and had a maximum concentration of 1800 mg/L (Table E.1-1); calcium was detected in unfiltered samples at above-background concentrations in 99 of 176 wells (56 percent) and had a maximum detected concentration of 4580 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, calcium was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-40 is a contour map of calcium concentrations in filtered perched groundwater samples based on the 1993 data set. In filtered perched groundwater, plumes of above-background calcium concentrations in multiple adjacent wells are present throughout the entire site. Calcium was detected at concentrations above four times background in samples from waste pits (W3), near the K-65 silos, and below the Plant 6 slug pickling area (6J). The maximum concentrations detected at these areas are in Well 1075 (1800 mg/L), Well 1615 (500 mg/L), and Well 1149 (841 mg/L), respectively. Calcium was detected at greater than 1.5 times background in samples from wells below Plant 1, Plant 2/3, Plant 9, the area north of the maintenance building, the coal pile, and wells near the waste pits. The maximum concentrations detected in these areas are in Well 1361 (264 mg/L), Well 1214 (263 mg/L), Well 1423 (347 mg/L), Well 1299 (203 mg/L), Well 1283 (342 mg/L), and Well 1025 (562 mg/L), respectively. Calcium was detected at above-background concentrations in isolated wells

throughout the site at 1.5 times background; e.g., at Well 1136 near Plant 2/3 (208 mg/L) and Well 1270 near the laboratory (329 mg/L).

Data from unfiltered samples suggest large plumes of calcium contamination in the perched groundwater across the entire site. However, calcium is a primary constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of calcium in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples from multiple adjacent wells suggest that plumes of calcium contamination are present in the perched groundwater near the waste pits, the K-65 silos, the Plant 6 slug pickling area, Plant 1, Plant 2/3, Plant 9, the area north of the maintenance building, and the coal pile. It appears that these plumes are due to past site activities. Isolated detections of elevated concentrations in filtered samples also suggest contamination due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentration.

E.1.2.8 Chromium

Chromium in filtered samples has a 95th percentile background concentration of 0.034 mg/L and background values that range from 0.006 to 0.0345 mg/L (Table E.0-1). Chromium in unfiltered samples has a 95th background concentration value of 0.0046 mg/L. Background for unfiltered chromium was determined on one sample with a value of 0.0046 mg/L.

Chromium was detected in filtered samples at above-background concentrations in 27 of 201 wells (13 percent) and had a maximum concentration of 0.818 mg/L (Table E.1-1). Chromium was detected in unfiltered samples at above-background concentrations in 107 of 174 wells (61 percent) and had a maximum detected concentration of 0.82 mg/L. As is typical of most inorganic parameters analyzed for at the FEMP, chromium was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-41 is a contour map of chromium concentrations in filtered perched groundwater samples based on the 1993 data set. Chromium was detected in filtered groundwater in a few isolated wells at

concentrations above background. Chromium was detected in four wells near Plant 2/3, three wells near the waste pits, three wells near the K-65 silos, three wells near Plant 6, and one well near Plant 9. Chromium concentrations range from 0.818 mg/L in Well 1149 in Plant 6, to 0.038 mg/L in Well 1032 near the K-65 silos.

Data from unfiltered samples suggest large plumes of chromium contamination in the perched groundwater across the entire site. However, chromium is found as a trace constituent in the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The larger apparent extent and higher concentrations of chromium in the unfiltered samples are likely due to the higher turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicators of groundwater conditions.

Elevated concentrations in filtered samples from isolated wells suggests that chromium contamination in the perched groundwater below Plant 2/3, the waste pits, the K-65 silos, Plant 6, and Plant 9 are due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentration.

E.1.2.9 Cobalt

Cobalt was not detected in either filtered or unfiltered samples collected to determine background; consequently, any detection of cobalt is considered an above-background concentration.

Cobalt was detected in filtered samples in 23 of 192 wells (12 percent) and had a maximum concentration of 0.0886 mg/L; cobalt was detected in unfiltered samples in 70 of 173 wells (40 percent) and had a maximum concentration of 0.489 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, cobalt was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-42 is a contour map of cobalt concentrations in filtered perched groundwater samples based on the 1993 data set. Cobalt was detected in filtered groundwater in multiple wells near the K-65 silos and the waste pits. The maximum concentrations detected in these areas are in Well 1617 (0.02 mg/L), and Wells 1080 and 1645 (0.01 mg/L) each. Cobalt was also detected in filtered

groundwater samples from isolated wells across the site. The maximum detected concentration was in Well 1149 (0.0886 mg/L) below Plant 6.

Unfiltered data suggest higher levels of cobalt contamination in the perched groundwater than is seen in the filtered groundwater samples. Because cobalt is found as a trace constituent in the natural soil matrix and because perched groundwater wells typically yield turbid water that carries significant clay and silt size particles, the larger apparent extent and higher concentrations of cobalt in the unfiltered samples are likely due to the high turbidity. Therefore, elevated concentrations in unfiltered samples are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples from multiple wells suggest that cobalt contamination in the perched groundwater below the K-65 silos, and the waste pits and in other isolated wells are due to site activities; however, some of the low detections may be due to background conditions in the perched groundwater.

E.1.2.10 Copper

Copper in filtered samples has a 95th percentile background concentration of 0.019 mg/L and background values that range from 0.013 to 0.03 mg/L (Table E.0-1). Copper in unfiltered samples has a 95th percentile background concentration value of 0.0294 mg/L and background values that range from 0.0053 to 0.0294 mg/L.

Copper was detected in filtered samples at above-background concentrations in 22 of 202 wells (11 percent) and had a maximum concentration of 0.298 mg/L; copper was detected in unfiltered samples at above-background concentrations in 65 of 174 wells (37 percent) and had a maximum detected concentration of 1.03 mg/L (Table E.1-1). As is typical of most inorganic parameters analyzed for at the FEMP, copper was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-43 is a contour map of copper concentrations in filtered perched groundwater samples based on the 1993 data set. Copper was detected in filtered samples at concentrations above background in several areas: four wells near Plant 2/3; three wells near the waste pits; three wells near Plant 6; two wells near the K-65 silos; and in isolated wells near Plant 9 and Plant 4. Copper concentrations range

from 0.02 mg/L in Wells 1076 and 1077 near the waste pits to 0.298 mg/L in Well 1324 near the Plant 9 sump (9I).

Data from unfiltered samples suggest large plumes of copper contamination in the perched groundwater below Plant 2/3, near the pilot plant, and in the vicinity of Plant 6. However, copper is found as a trace constituent in the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of copper in the unfiltered samples are likely due to the higher turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples were detected in isolated wells in the perched groundwater. These above-background detections suggest that copper contamination below Plant 2/3, near the waste pits, the K-65 silos, and Plants 6, 9, and 4 are due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentration.

E.1.2.11 Cyanide

Cyanide was not detected in either filtered or unfiltered samples collected to determine background; consequently, any detection of cyanide is considered an above-background concentration.

Cyanide was detected in unfiltered samples in 15 of 208 wells (7 percent) and had a maximum concentration of 0.5519 mg/L, filtered cyanide data was collected but a discussion of this data is inappropriate (Table E.1-1).

Plate E-44 is a contour map of cyanide concentrations in unfiltered perched groundwater samples based on the 1993 data set. Although few detections were noted in the unfiltered samples, cyanide was detected in three wells near the K-65 silos, two wells near the Plant 9 sump (9I), and two wells near Plant 6. Isolated detections of cyanide were found below Plant 2/3, near the waste pits, and near the fire training area. Cyanide concentrations range from 0.002 mg/L in Well 1890 to 0.5519 mg/L in Well 1233, near Plant 2/3 (the location of this well is not shown on the contour map).

Detections of cyanide in unfiltered samples from isolated wells in the perched groundwater suggest that cyanide contamination near the K-65 silos, Plant 9, Plant 2/3, and near the waste pits is due to site activities.

E.1.2.12 Iron

Iron in filtered samples has a 95th percentile background concentration of 3.58 mg/L and background values that range from 0.0467 to 4.9 mg/L (Table E.0-1). Iron in unfiltered samples has a 95th percentile background concentration of 5.5 mg/L and background values that range from 0.249 to 6.35 mg/L.

Iron was detected in filtered samples at above-background concentrations in 11 of 203 wells (5 percent) and had a maximum concentration of 21.3 mg/L; iron was detected in unfiltered samples at above-background concentrations in 99 of 174 wells (57 percent) and had a maximum concentration of 1110 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, iron was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-45 is a contour map of iron concentrations in filtered perched groundwater samples based on the 1993 data set. Iron was detected at above-background concentrations in multiple adjacent wells in the filtered perched groundwater near the NFS UNH tanks (2E), below Plant 1, and near the K-65 silos. The maximum concentration observed in these areas are in Well 1357 (20.4 mg/L), Well 1345 (16.1 mg/L), and Well 1617 (20.1 mg/L), respectively. Iron was also detected at above-background concentrations in a few isolated wells across the site: in Well 1011 (21.3 mg/L) near the waste pits and Well 1443 (6.9 mg/L) near the sewage treatment plant.

Data from unfiltered samples suggest large plumes of iron contamination in the perched groundwater across the entire site. However, iron is a primary constituent of the natural soil matrix, and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of iron in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples from multiple wells near the NFS UNH tanks, Plant 1, and the K-65 silos suggest that iron contamination is due to site activities. Elevated concentrations in

filtered samples from isolated wells are probably due to site activities; however, detections that are less than two times background may be due to the natural variability in background concentrations.

E.1.2.13 Lead

Lead in filtered samples has a 95th percentile background concentration of 0.0087 mg/L and background values that range from 0.0014 to 0.0087 mg/L (Table E.0-1). Lead in unfiltered samples has a 95th percentile background concentration of 0.0016 mg/L and background values that range from 0.0013 to 0.0016 mg/L.

Lead was detected in filtered samples at above-background concentrations in 5 of 203 wells (2 percent) and had a maximum concentration of 0.0114 mg/L; lead was detected in unfiltered samples at above-background concentrations in 109 of 182 wells (60 percent) and had a maximum concentration of 1.15 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, lead was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-46 is a contour map of lead concentrations in filtered perched groundwater samples based on the 1993 data set. Lead was detected in the filtered groundwater samples in four isolated wells, Well 1279, 0.0114 mg/L; Well 1161, 0.011 mg/L; Well 11089, 0.009 mg/L; and Well 1045, 0.010 mg/L.

Unfiltered data suggest large plumes of lead contamination in the perched groundwater across the entire site. However, lead is a constituent of the natural soil matrix, and perched groundwater wells typically yield turbid water that carries significant clay and silt size particles. The relatively high concentrations of lead in many unfiltered samples are likely due to the high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations of lead may be due to site activities; however, detections are less than twice background and may be due to the natural variability in background concentrations.

E.1.2.14 Magnesium

Magnesium in filtered samples has a 95th percentile background concentration of 47.8 mg/L and background values that range from 20.4 to 47.8 mg/L (Table E.0-1). Magnesium in unfiltered samples has a 95th percentile background concentration of 50.7 mg/L and background values that range from 23.1 to 50.7 mg/L.

Magnesium was detected in filtered samples at above-background concentrations in 97 of 204 wells (48 percent) and had a maximum concentration of 690 mg/L; magnesium was detected in unfiltered samples at above-background concentrations in 128 of 176 wells (73 percent) and had a maximum concentration of 1530 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, magnesium was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-47 is a contour map of magnesium concentrations in filtered perched groundwater samples based on the 1993 data set. Plumes of above-background magnesium concentrations are present throughout the entire site. Magnesium was detected at concentrations above three times background in filtered groundwater samples from wells near the waste pit area, and the Plant 6 slug pickling area (6J). The maximum concentrations detected in these areas were in Well 1075 (690 mg/L) and Well 1149 (217 mg/L), respectively. Magnesium was detected at concentrations twice above background in filtered perched groundwater samples from wells near Plant 9, north of the maintenance building, and between Plants 2/3 and 8. The maximum concentrations detected in these areas were in Well 1423 (103 mg/L), Well 1299 (107 mg/L), and Well 1235 (98.9 mg/L), respectively. Additional plumes of concentrations above background are found in and west of the sewage treatment plant area, south of the laboratory, near the K-65 silos, near the drum bailing area, and in the vicinity of the coal pile, Plant 1 and the Plant 1 storage pad.

The greater frequency of elevated concentrations of magnesium in unfiltered samples suggests large plumes of magnesium contamination in the perched groundwater across the entire site. However, magnesium is a primary constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries clay- and silt-size particles. The relatively high concentrations of magnesium in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations of magnesium in filtered samples of perched groundwater from multiple adjacent wells suggest that plumes of magnesium contamination are present in the perched groundwater under the waste pit area, Plant 6, Plant 9, north of the maintenance building, between Plants 2/3 and 8, near sewage treatment plant area, south of the laboratory, near the K-65 silos, near the drum bailing area, and in the vicinity of the coal pile Plant 1 and Plant 1 storage pad. It appears that these plumes are due to past site activities. There are also two isolated detections of magnesium at less than two times background in a few wells across the site that are probably due to variability in background concentrations; however, they may be caused by site activities.

E.1.2.15 Manganese

Manganese in filtered samples has a 95th percentile background concentration of 0.18 mg/L and background values that range from 0.0025 to 0.22 mg/L (Table E.0-1). Manganese in unfiltered samples has a 95th percentile background concentration of 0.205 mg/L and background values that range from 0.0035 to 0.205 mg/L.

Manganese was detected in filtered samples at above-background concentrations in 95 of 202 wells (47 percent) and had a maximum concentration of 35 mg/L; manganese was detected in unfiltered samples at above-background concentrations in 130 of 174 wells (75 percent) and had a maximum concentration of 39.7 mg/L (Table E.1-1). As is typical of most inorganic parameters at the FEMP, manganese was detected less frequently and at lower concentrations in filtered samples than unfiltered samples.

Plate E-48 is a contour map of manganese concentrations in filtered perched groundwater based on the 1993 data set. In filtered samples, manganese was detected at concentrations above background throughout much of the production area. Manganese levels ranged from background concentrations to a maximum concentration almost 200 times background (35.00 mg/L in Well 1075) in the waste pit area. A large plume of elevated manganese concentrations is present below Plant 1, the Plant 1 pad, and the Plant 1 thorium warehouse (67) where the maximum concentration was above 50 times background (9.03 mg/L in Well 1342). Additional areas with manganese concentrations in multiple adjacent wells are in the vicinity of the KC-2 warehouse, the fire training area, under Plant 9, near the K-65 silos, and in the hot raffinate building area. The maximum concentrations detected in these areas, that all exceed three times background, are in Well 1332 (2.83 mg/L), Well 1508 (1.47 mg/L), Well 1786 (0.96 mg/L), Well 1617 (0.62 mg/L), and Well 1223 (0.73 mg/L), respectively.

Areas where manganese is detected in filtered samples from isolated wells at concentrations above three times background are the South Field (0.74 mg/L in Well 1020), south of the laboratory (0.82 mg/L in Well 1270), north of the pilot plant (2.55 mg/L in Well 1239), in the Weston trailer area in the northwest corner of the site (1.30 mg/L in Well 1011), and in the sewage treatment plant area (0.80 mg/L in Well 1443). Isolated occurrences of manganese at concentrations just above background are observed throughout the site.

The greater frequency of elevated concentrations and higher concentrations of manganese from unfiltered samples suggests large plumes of manganese contamination in the perched groundwater across the entire site. However, manganese is a constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of manganese in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

The plumes of manganese concentrations greater than three times background in the perched groundwater near the waste pits, Plant 1, the KC-2 warehouse, the fire training area, under Plant 9, near the K-65 silos, in the hot raffinate building area, the South Field, south of the laboratory, north of the pilot plant, and in the sewage treatment plant area appear to be the result of site activities. Manganese concentrations slightly above background from isolated wells across the site, as well as an isolated detection seven times background in a well in the Weston trailer area in the northwest corner of the site, may be due to site activities; however, due to their locations, it cannot be ruled out that they are a result of variability in background concentrations.

E.1.2.16 Mercury

Mercury in filtered samples has a 95th percentile background concentration of 0.0004 mg/L (Table E.0-1). Background for filtered mercury was determined on one sample with a value of 0.0004 mg/L. Mercury was not detected in unfiltered samples collected to determine background; consequently, any detection of mercury in unfiltered samples is potentially an above-background value.

Mercury was detected in filtered samples at above-background concentrations in 4 of 202 wells (2 percent) and had a maximum concentration of 0.0018 mg/L (Table E.1-1). Mercury was detected

in unfiltered samples in 10 of 175 wells (6 percent) and had a maximum concentration of 0.0045 mg/L.

Plate E-49 is a map of mercury concentrations in filtered perched groundwater samples based on the 1993 data set. In the filtered samples, the maximum mercury concentration was detected in Well 1183 (0.0018 mg/L) in the Plant 2/3 area. Two other wells in the Plant 2/3 area had detections of mercury; Well 1250 (0.00048 mg/L), and Well 1203 (0.00026 mg/L). The three wells mentioned above are not shown on the map. An isolated above-background detection of mercury occurred near the northern FEMP property boundary in Well 1012 (0.0010 mg/L).

Few detections of mercury were noted in unfiltered samples of the perched groundwater. The only detections of mercury in multiple adjacent wells were in the South Field (0.0002 mg/L in Well 11032 and 0.0004 mg/L in Well 11085). Detections of mercury in isolated wells were in the waste pits, the fire training area, Plant 9, north of Plant 8, east of the Plant 6 warehouse, near Plant 2/3, and south of the pilot plant. The maximum concentration was detected in Well 1081 in the waste pit area (0.0006 mg/L). Mercury that was detected in unfiltered samples from multiple adjacent wells in the South Field and may be due to site activities in this area. But due to the relatively low concentrations, it cannot be ruled out that these detections may be due to variability in background concentrations. Detections of mercury in unfiltered samples from isolated wells in the waste pits, the fire training area, Plant 9, north of Plant 8, and near Plant 2/3 may also be due to site activities based on their locations. Detections of mercury in unfiltered samples from Well 1523 and Well 1152 do not appear associated with a source of mercury and may simply be due to variability in background concentrations.

An isolated detection of mercury above two times background in the filtered perched groundwater was detected in one well near Plant 2/3 (Well 1183, 0.0018 mg/L). Elevated concentrations in this well may be due to site activities. Other detections less than twice background may simply be due to variability in background concentration.

E.1.2.17 Molybdenum

Molybdenum in filtered samples has a 95th percentile background concentration of 0.017 mg/L. Background for filtered molybdenum was determined based on two samples with values of 0.017 and 0.028 mg/L (Table E.0-1). Molybdenum was not detected in unfiltered samples collected to

determine background; consequently, any detection of molybdenum is a potentially above-background value.

Molybdenum was detected at above-background concentrations in filtered samples in 25 of 146 wells (17 percent) and had a maximum concentration of 1.42 mg/L (Table E.1-1). Molybdenum was detected in unfiltered samples in 27 of 118 wells (23 percent) and had a maximum concentration of 0.75 mg/L.

Plate E-50 is a contour map of molybdenum concentrations in filtered perched groundwater based on the 1993 data set. Molybdenum was detected in above-background concentrations in filtered samples from multiple adjacent wells south of Plant 2/3, in the waste pit area, and in the vicinity of the K-65 silos. The maximum concentrations detected in these areas were 0.041 mg/L in Well 1215 (this well is not shown on map), 1.010 mg/L in Well 1031, and 0.266 mg/L in Well 1617, respectively. Molybdenum was detected at above three times background in isolated wells near the green salt plant sumps (4D) (1.420 mg/L in Well 1135). Molybdenum was detected at just above background near the laboratory (0.020 mg/L in Well 1053), beneath the Plant 9 sump (9I) (0.030 mg/L in Well 1324), and east of Plant 8 (0.025 mg/L in Well 1237).

Detections of molybdenum were noted in unfiltered samples from wells scattered across the production area. As perched groundwater wells typically yield turbid water that carries clay- and silt-size particles, detections of molybdenum in unfiltered samples are probably due to this high turbidity. Elevated concentrations in unfiltered samples are not considered conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations of molybdenum in filtered samples from multiple adjacent wells suggest that small plumes of molybdenum contamination in the perched groundwater near the waste pit area, south of Plant 2/3, and near the K-65 silos are due to site activities. Isolated detections of above-background concentrations near the green salt plant sumps, near the laboratory, beneath the Plant 9 sump (9I), and east of Plant 8 may also be due to site activities; however, detections less than twice background may simply be due to variability in background concentrations.

E.1.2.18 Nickel

Nickel in filtered samples has a 95th percentile background concentration of 0.022 mg/L and background values that range from 0.021 to 0.026 mg/L (Table E.0-1). Nickel in unfiltered samples has a 95th percentile background concentration of 0.0072 mg/L. Background for unfiltered nickel was determined on one sample with a value of 0.0072 mg/L.

Nickel was detected at above-background concentrations in filtered samples in 33 of 202 wells (16 percent) and had a maximum concentration of 0.981 mg/L (Table E.1-1). Nickel was detected in unfiltered samples in 92 of 174 wells (53 percent) and had a maximum concentration of 1.47 mg/L. As is typical of most inorganic parameters at the FEMP, nickel was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Plate E-51 is a map of nickel concentrations in filtered perched groundwater based on the 1993 data set. Nickel was detected at above-background concentrations in filtered groundwater samples from multiple adjacent wells near the Plant 9 sump (9I), the waste pit area, green salt plant sump (4D), and the K-65 silos. Maximum concentrations detected for these areas were 0.071 mg/L (Well 1786), 0.981 mg/L (Well 1028), 0.096 mg/L (Well 1136), and 0.063 mg/L (Well 1615), respectively. These maximum concentrations range from just below three times background to 45 times background. One isolated occurrence of nickel at greater than two times background in filtered groundwater was in the Plant 6 area (0.058 mg/L in Well 1148). Isolated concentrations of nickel at just above background were detected near the coal pile runoff basin (18C) (0.026 mg/L in Well 1675), near the fire training area (0.026 mg/L in Well 11229), near the NFS UNH tanks (2E) (0.027 mg/L in Well 1357), near the solid waste landfill (SWL) (0.027 mg/L in Well 11078), and near the Weston trailer area (0.026 mg/L in Well 1011).

The more frequent elevated concentrations of nickel in unfiltered samples suggests large plumes of nickel contamination in the perched groundwater across the entire site. However, nickel is found as a trace constituent in the natural soil matrix and perched groundwater wells typically yield turbid water that carries clay- and silt-size particles. The relatively high concentrations of nickel in the unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples suggest that nickel contamination present in the perched groundwater near the Plant 9 sump, the K-65 silos, the green salt plant sump, Plant 6 area, and the waste pit area is probably due to site activities. Isolated concentrations of nickel at just above background, detected near the coal pile runoff basin, the fire training area, the NFS UNH tanks, the solid waste landfill, and the Weston trailer area may be due to site activities or, because of their low concentrations, may simply be due to variability in background concentrations.

E.1.2.19 Potassium

Potassium in filtered samples has a 95th percentile background concentration of 29.3 mg/L and background values that range from 0.891 to 31.5 mg/L (Table E.0-1). Potassium from unfiltered samples has a 95th percentile background concentration of 17.2 mg/L and background values that range from 0.963 to 17.2 mg/L.

Potassium was detected in filtered samples at above-background concentrations in 5 of 203 wells (2 percent) and had a maximum concentration of 12,400 mg/L (Table E.1-1). Potassium was detected in unfiltered samples at above-background concentrations in 18 of 177 wells (10 percent), and a maximum concentration of 82 mg/L in Well 1031 in the waste pit area.

Plate E-52 is a contour map of potassium concentrations in filtered perched groundwater based on the 1993 data set. Potassium was detected at above-background concentrations in filtered samples from two wells in the waste pit area. The maximum concentration detected in this area was 100.0 mg/L (Well 1075), that is over three times background. Potassium was detected at 12,400 mg/L in Well 1135 in the green salt plant sump area (4D), a value over 400 times background. Potassium was also detected at slightly above-background in one well in the area of the Plant 1 thorium warehouse (67) (32.7 mg/L in Well 1351).

Potassium was detected in unfiltered samples of perched groundwater at above-background concentrations in the South Field, in the pilot plant area, east of the Plant 6 warehouse, near Plant 2/3, the Plant 1 pad, fire training area and the waste pit area. These are isolated occurrences except for Plant 2/3 and the South Field where potassium was detected at above-background concentrations in multiple adjacent wells. A maximum concentration of 27.4 mg/L (Well 11085) was detected in the South Field and a maximum concentration of 45.8 mg/L (Well 1189) was detected in the Plant 2/3 area.

Concentrations of potassium from both filtered and unfiltered samples indicate potassium is present in the perched groundwater under the waste pits. Elevated concentrations in filtered samples suggest additional contamination in the perched groundwater under the green salt plant sumps and the Plant 1 thorium warehouse area that may be due to site activities. Additional data from unfiltered samples indicate that potassium contamination from site activities may be present below Plant 2/3, in the South Field, in the pilot plant area, east of the Plant 6 warehouse, the Plant 1 pad, and the fire training area.

E.1.2.20 Selenium

Selenium was not detected in either filtered or unfiltered samples collected to determine background; consequently, any detection of selenium is potentially an above-background value.

Selenium was detected in filtered samples in 19 of 202 wells (9 percent) and had a maximum concentration of 0.0494 mg/L (Table E.1-1). Selenium was detected in unfiltered samples in 19 of 174 wells (11 percent), and had a maximum concentration of 0.0566 mg/L.

Plate E-53 is a map of selenium concentrations in filtered perched groundwater based on the 1993 data set. Selenium was detected in filtered samples of perched groundwater from multiple adjacent wells west of the NFS UNH tanks (2E), in the waste pit area, and near the K-65 silos. The maximum concentrations detected in these areas are 0.003 mg/L in Well 1352, 0.006 mg/L in Well 1031, and 0.049 mg/L in Well 1617, respectively. The concentrations of selenium in the waste pit area and NFS UNH tanks are only slightly above the detection limits. Selenium was also detected in several isolated wells across the site. These wells are located in the South Field (0.018 mg/L in Well 1045), outside the equipment storage area (P007) (0.006 mg/L in Well 1281), the fire training area (0.002 mg/L in Well 1890), west of the KC-2 warehouse (63) (0.001 mg/L in Well 1332), east of the laboratory (0.004 mg/L in Well 1840), the refinery sump area (3H) (0.003 mg/L in Well 1226), near Plant 1 (0.003 mg/L in Well 1345), and east of the finishing product warehouse (0.001 mg/L in Well 1064). These were isolated detections and nearby wells did not have elevated levels of selenium.

The greater number of selenium detections in unfiltered samples suggests that selenium concentrations are elevated sitewide. However, perched groundwater wells typically yield turbid water that carries clay- and silt-size particles. The greater number of selenium detections in unfiltered samples is

probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in the groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations of selenium in filtered samples from multiple adjacent wells suggest that selenium contamination is present in the perched groundwater near the K-65 silos, waste pits, the NFS UNH tanks and this contamination is due to site activities. Additionally, elevated concentrations of selenium in filtered samples from isolated wells suggests that selenium contamination in those areas is also due to site activities. Only the elevated concentration in Well 1064 east of the finishing product warehouse does not appear to be due to site activities because the concentration is only slightly above the detection limit and the location does not appear to be near a source of selenium.

E.1.2.21 Silicon

Silicon in filtered samples has a 95th percentile background concentration of 7.43 mg/L and background values that range from 5.62 to 7.43 mg/L (Table E.0-1). Silicon in unfiltered samples has a 95th percentile background concentration of 10.7 mg/L and background values that range from 5.6 to 10.7 mg/L.

Silicon was detected in filtered samples at above-background concentrations in 31 of 91 wells (34 percent) and had a maximum concentration of 15 mg/L (Table E.1-1). Silicon was detected in unfiltered samples at above-background concentrations in 28 of 62 wells (45 percent) and had a maximum concentration of 83.4 mg/L. As is typical of most inorganic parameters at the FEMP, silicon was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Silicon concentrations above background in filtered samples are observed throughout the perched water in the site; however, no area of high concentrations were noted. The maximum concentration was detected in Well 1645 in the vicinity of the waste pit area. The concentration of silicon detected in this well was only 15 mg/L, which is only slightly above two times background. Additional areas where concentrations of silicon slightly above background were detected in multiple adjacent wells are the South Field, west of the sewage treatment plant, Plant 9, Plant 5, Plant 1, and solid waste landfill. Isolated detections of above-background concentrations of silicon were in Plant 6, the fire training

area, the green salt plant sump area (40), east of Plant 8, east of the Plant 1 pad, and in the vicinity of the K-65 silos.

The more frequent elevated concentrations and higher concentrations of silicon in unfiltered samples suggests large plumes of silicon contamination in the perched groundwater across the entire site. However, silicon is a primary constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of silicon in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

The low concentrations of silicon detected in filtered samples of the perched groundwater could be due to site activities, but because there are no high concentrations, they could also be due to variability in naturally occurring concentrations.

E.1.2.22 Silver

Silver in filtered samples has a 95th percentile background concentration of 0.04 mg/L and background values that range from 0.0105 to 0.052 mg/L (Table E.0-1). Silver from unfiltered samples has a 95th percentile background concentration of 0.0031 mg/L. Background was determined for unfiltered samples based on one sample with a value of 0.0031 mg/L.

Silver was detected in filtered samples at above-background concentrations in 12 of 202 wells (6 percent) and had a maximum concentration of 0.264 mg/L (Table E.1-1). Silver was detected in unfiltered samples at above-background concentrations in 35 of 174 wells (20 percent) and had a maximum detected concentration of 0.138 mg/L. As is typical of most inorganic parameters at the FEMP, silver was detected less frequently and at lower concentrations in filtered samples relative to unfiltered samples.

Plate E-54 is a contour map of silver concentrations in filtered perched groundwater based on the 1993 data set. Silver was detected above background in filtered samples in the perched groundwater in four adjacent wells (Wells 1145, 1148, 1149, and 1161) in the Plant 6 area. The concentrations detected were 0.052, 0.062, 0.264 mg/L, and 0.166 mg/L, respectively. There were also two

occurrences of elevated silver in the Plant 2/3 area (Wells 1209 and 1232). These detections (0.043 and 0.069 mg/L, respectively) are less than two times background.

The more frequent elevated concentrations of silver in unfiltered samples suggest extensive areas of elevated silver concentrations across the entire site. However, perched groundwater wells typically yield turbid water that carries clay- and silt-size particles. The relatively high concentrations of silver in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations of silver detected in filtered samples of the perched groundwater under Plant 6 and Plant 2/3 may be due to site activities based on their locations.

E.1.2.23 Sodium

Sodium in filtered samples has a 95th percentile background concentration of 56.3 mg/L and background values that range from 5.71 to 56.3 mg/L (Table E.0-1). Sodium in unfiltered samples has a 95th percentile background concentration of 50.0 mg/L and background values that range from 8.81 to 50.0 mg/L.

Sodium was detected in filtered samples at above-background concentrations in 35 of 203 wells (17 percent) and had a maximum concentration of 1300 mg/L (Table E.1-1). Sodium was detected in unfiltered samples at above-background concentrations in 36 of 176 wells (20 percent) and had a maximum detected concentration of 1040 mg/L.

Plate E-55 is a contour map of sodium concentrations in filtered perched groundwater based on the 1993 data set. Sodium concentrations in filtered samples of the perched groundwater indicate plumes of above-background sodium concentrations throughout the entire site. Sodium was detected at concentrations above three times background in samples from multiple adjacent wells near the K-65 silos, near Plant 6, in the vicinity of Plant 9, and northeast of the Plant 1 pad, and in the waste pit area. The maximum concentrations detected in these areas were 1070 mg/L (Well 1615), 178.0 mg/L (Well 1149), 219.0 mg/L (Well 1786), 185.0 mg/L (Well 1340), and 1300 mg/L (Well 1075), respectively. Sodium was detected up to two times background in multiple adjacent wells south of Plant 6. The maximum concentration detected in this area was 123.0 mg/L in Well 1112.

Sodium was detected at concentrations above three times background in isolated wells north of the production area (194.0 mg/L in Well 1012), west of the KC-2 warehouse (63) (255.0 mg/L in Well 1332), and north of Plant 8 (80.9 mg/L in Well 1236). Sodium was detected at concentrations just above background in isolated wells across the site.

Possible sources for sodium contamination include: leakage from Plant 8, bulk storage of sodium hydroxide, sodium carbonate, and dry waste residues; migration from disposal in waste pits (W1, W2, W3, and W4); runoff from the wet salt storage area; and leakage from the salt-oil heat treating facility (6F).

Elevated concentrations of sodium in filtered samples suggest that plumes of sodium contamination in the perched groundwater are present in the areas specified above. Due to the concentrations of sodium and the locations of the plumes, they appear to be a result of prior site activities. The concentrations of sodium in unfiltered samples of perched groundwater support these conclusions.

E.1.2.24 Thallium

Thallium was not detected in either filtered or unfiltered samples collected to determine background; consequently, any detection of thallium is potentially an above-background concentration.

Thallium was detected in filtered samples in 4 of 192 wells (2 percent) and had a maximum concentration of 0.0028 mg/L (Table E.1-1). Thallium was detected in unfiltered samples in 7 of 173 wells (4 percent) and had a maximum concentration of 0.006 mg/L.

Plate E-56 is a contour map of thallium concentrations in filtered perched groundwater based on the 1993 data set. Few detections of thallium were noted in the perched water for filtered or unfiltered samples. Thallium was only detected at concentrations slightly above the detection limit in four isolated wells. The concentrations ranged from 0.001 to 0.003 mg/L. These concentrations were detected in the waste pit area (Well 11216), the Plant 2/3 area (Well 1412), near the coal pile runoff basin (18C) (Well 1287), and a remote well in the southeast corner of the site (Well 1733).

Thallium was detected in unfiltered samples of perched groundwater at multiple adjacent wells in the Plant 2/3 area (Wells 1201, 1197, and 1214). However, the maximum concentration of thallium in this area was only 0.002 mg/L. There were additional detections of thallium in unfiltered samples

from isolated wells in the Plant 6 area (0.001 mg/L in Well 1145), Plant 8 area (0.001 mg/L in Well 1242), and the waste pit area (0.006 mg/L in Well 1025).

Although thallium was detected in both filtered and unfiltered samples of the perched groundwater, the concentrations were only slightly above the detection limit or were found only in a few isolated wells. The thallium concentrations detected in the areas listed above may be due to site activities based on their locations, but may also simply be due to variability in naturally occurring concentrations of thallium.

E.1.2.25 Vanadium

Vanadium in filtered samples has a 95th percentile background concentration of 0.0195 mg/L and background values that range from 0.018 to 0.0195 mg/L (Table E.0-1). Vanadium in unfiltered samples has a 95th percentile background concentration of 0.0051 mg/L. Background for unfiltered vanadium was determined from one sample with a value of 0.0051 mg/L.

Vanadium was detected in filtered samples in 23 of 195 wells (12 percent) and had a maximum concentration of 0.299 mg/L (Table E.1-1). Vanadium was detected in unfiltered samples in 100 of 174 wells (57 percent) and had a maximum concentration of 3.25 mg/L. As is typical of most inorganic parameters at the FEMP, vanadium was detected less frequently and at lower concentrations in filtered samples relative to unfiltered samples.

Plate E-57 is a contour map of vanadium concentrations in filtered perched groundwater based on the 1993 data set. Vanadium was detected at above-background concentrations in filtered samples from multiple adjacent wells from the sewage treatment plant, K-65 silos, waste pits, and northeast and southwest of Plant 2/3. The maximum concentrations detected were above three times background in the waste pit area (0.061 mg/L in Well 1028) and southwest of Plant 2/3 (0.059 mg/L in Well 1232). The maximum concentration in the area northeast of Plant 2/3 was just below three times background (0.049 mg/L in Well 1186). Concentrations detected in multiple adjacent wells in the sewage treatment plant and the K-65 silo area were only slightly above background. The maximum concentration for each of these areas was 0.027 mg/L in Well 1442 and Well 1617, respectively.

The maximum concentration in filtered samples of 0.299 mg/L was detected in Well 1149 under Plant 6. This was an isolated detection and the surrounding wells did not have elevated

concentrations of vanadium. There was also one isolated detection of vanadium at above 10 times background detected in Well 1324 by the Plant 9 sump (9I) and one in the South Field at less than two times background (0.032 mg/L in Well 1045).

The more frequent elevated concentrations in unfiltered samples suggest large plumes of vanadium contamination in the perched groundwater across the entire site. However, perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of vanadium in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated dissolved contaminant concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

Elevated concentrations in filtered samples from multiple adjacent wells suggest that plumes of vanadium contamination are present in the perched groundwater near the waste pits and northeast and southwest of Plant 2/3. It appears that these plumes are due to past site activities. The elevated concentrations northeast and southwest of Plant 2/3 appear to be separate plumes since there are wells between these two areas without detected concentrations of vanadium. Due to their locations, the low concentrations of vanadium detected above background in multiple adjacent wells in the sewage treatment plant area and the K-65 silo area, and the high detection in the isolated well in the Plant 9 sump area are probably also due to site activities. The vanadium detection just above background in the South Field is probably due to site activities based on its location; however, because of the low concentration, it may be due to the natural variability in background concentrations.

E.1.2.26 Zinc

Zinc in filtered samples has a 95th percentile background concentration of 0.0443 mg/L and background values that range from 0.0104 to 0.0443 mg/L (Table E.0-1). Zinc in unfiltered samples has a 95th percentile background concentration of 0.352 mg/L, and background values that range from 0.0192 to 0.352 mg/L.

Zinc was detected in filtered samples in 13 of 195 wells (7 percent) and had a maximum concentration of 1.78 mg/L (Table E.1-1). Zinc was detected in unfiltered samples in 21 of 173 wells (12 percent) and had a maximum concentration of 3380 mg/L. As is typical of most inorganic parameters at the FEMP, zinc was detected less frequently and at lower concentrations in filtered than in unfiltered samples.

Plate E-58 is a contour map of zinc concentrations in filtered perched groundwater based on the 1993 data set. Zinc was detected at above-background concentrations in filtered samples of the perched groundwater in multiple adjacent wells in the area of the K-65 silos, the waste pits, and Plant 6. The maximum concentration in the K-65 silo area was 1.780 mg/L in Well 1615, which is over 40 times background. The maximum concentration in the waste pit area was only just above background (0.058 mg/L in Well 1075). The maximum concentration below Plant 6 was 0.758 mg/L in Well 1161. Zinc was detected at concentrations above background in two isolated wells: 0.076 mg/L near the green salt plant sumps (4D) (Well 1135), and 0.055 mg/L near the NFS UNH tanks (2E) (Well 1357). However, none of these concentrations exceed two times background.

The more frequent elevated concentrations in unfiltered samples suggest large plumes of zinc contamination in the perched groundwater across the entire site. However, zinc is a constituent of the natural soil matrix and perched groundwater wells typically yield turbid water that carries significant clay- and silt-size particles. The relatively high concentrations of zinc in many unfiltered samples are probably due to this high turbidity and are not conclusive indicators of elevated contaminant dissolved concentrations in groundwater, making filtered samples the best indicator of groundwater conditions.

High concentrations of zinc in filtered samples from multiple adjacent wells near the K-65 silos and in the waste pit area suggest that plumes of zinc contamination in the perched groundwater are due to site activities. Due to their location, above-background concentrations of zinc in filtered samples from wells in the other areas mentioned may also be due to site activities.

E.1.3 ORGANIC PARAMETERS

E.1.3.1 Volatile Organic Compounds

Volatile organic compounds (VOCs) comprise a class of organic chemicals that includes many solvents and agents commonly used at the FEMP. VOCs used on site include trichloroethene (TCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), benzene, and chloroform. VOCs are not expected to be present in the normal background condition of perched groundwater; consequently, any detection of any volatile is considered to be above background. Table E.1-1, which presents 1993 sampling data, shows summary statistics of analyses for individual VOCs.

Recent research (EPA 1989b) has shown that aerobic bacteria predominantly degrade organic compounds with zero, one or two halogens while anaerobic bacteria predominate when more halogens are present. Thus, highly chlorinated aliphatic hydrocarbons such as TCE and PCE are subject to reductive dehalogenation via the action of anaerobic bacteria. It does not appear that appreciable degradation of highly halogenated aliphatics occurs in aerobic aquatic systems (EPA 1982b) or unsaturated soils (Lyman et al. 1982).

Figure E.1.3-1 (from Dragun 1988) shows the transformation pathways in soil systems for various chlorinated aliphatic hydrocarbons found at the site. As can be seen, PCE could be transformed to TCE, which could then be transformed to 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), and trans-1,2-DCE. Similarly, 1,1,1-TCA could be transformed to 1,1-dichloroethane (1,1-DCA) and/or 1,1-DCE, which can then be transformed to vinyl chloride and/or chloroethane. This may explain the presence of these chemicals in groundwater, though only 1,1,1-TCA, PCE, and TCE were solvents reportedly used at the site. If biodegradation of these chemicals is occurring, reducing conditions under at least a portion of the site are indicated. It should be noted that the final transformation products shown, vinyl chloride and chloroethane, are the most toxic compounds shown.

The frequency of detections of these chlorinated aliphatic volatiles in the perched groundwater implies that transformation is still in its early stages. Solvents such as PCE (22/217), TCE (26/217), and 1,1,1-TCA (41/217) are detected more frequently than the final transformation products vinyl chloride (4/216) and chloroethane (3/215). The intermediate transformation products are detected at frequencies generally between the frequencies of the solvents and the final transformation products as shown by the following values: 1,1-DCA (48/216), 1,1-DCE (24/216), 1,2-DCE (32/215), and 1,2-dichloroethane (1,2-DCA) (6/216). All frequency of detection values are based on 1993 data.

Plate E-59 presents contours for total VOCs in perched groundwater and Plates E-60 through E-66 present contours for selected VOCs in perched groundwater. Isoconcentration maps are based on 1993 sampling data. Contours have been drawn for areas of elevated total VOC concentrations.

The Plant 9 area (9I) displayed the highest concentrations of VOCs. In this area, a maximum total VOC concentration of 12,466 μg/L was detected in Well 1324. Well 1786 had concentrations of principal solvents 1,1,1-TCA at 58 μg/L, PCE at 220 μg/L, and TCE at 10,000 μg/L. Well 1324

had elevated levels of 1,2-DCE at 35 μg/L. Well 1423 had elevated levels of 1,1-DCA at 76 μg/L. Plant 9 was the special products plant (9A) where a wide variety of activities occurred related to fabrication and finishing of metals. VOCs may have entered the subsurface via leaking of process waters treatment, below-grade piping, or sumps.

The area around the oil burner (10D) displayed high concentrations of VOCs; a concentration of 3029.6 μg/L was detected in Well 1287. Well 1287 showed concentrations of principal solvents 1,1,1-TCA at 310 μg/L, PCE at 310 μg/L, and TCE at 980 μg/L. Well 1283 showed concentrations of 1,1-DCA at 800 μg/L, and 1,2 DCE at 1000 μg/L. Benzene and chloroform were detected but not quantified at Wells 1283 and 1287. A small refractory brick enclosure housed steel burning pots for combustion of contaminated oil/solvents. In addition to the burn vessel, waste oils/solvents were stored in drums, an oil-water separator tank, and a steam-heated tank. VOCs may have entered the subsurface via spills and leaks during this self-sustained combustion process.

High concentrations of VOCs in multiple adjacent wells were observed in an area that extends beneath Plant 6; the maximum concentration of total VOCs was detected in Well 1149 at 7546 μg/L. The principal solvent (PCE) was detected in Well 1145 at 2600 μg/L as was 1,1,1-TCA at 270 μg/L and 1,2-DCE at 310 μg/L. Well 1149 had elevated levels of TCE at 3700 μg/L. Well 1778 had elevated levels of 1,1-DCA at 97 μg/L. Benzene and chloroform were detected but not quantified at Wells 1324 and 1145. Plant 6 housed the metals fabrication plant (6A). A wide variety of activities occurred in these plants related to fabrication and finishing of metals. VOCs may have entered the subsurface via leaking of process waters treatment, below-grade piping, or sumps.

In the area of Plant 2/3, VOC contamination in multiple adjacent wells was observed in two general areas. First, in the vicinity of the incinerator building (39A) and waste oil decant shelter (39B) a concentration of total VOCs was found in Well 1189 (51 μg/L). In Well 1189 1,1,1-TCA was detected at 46 μg/L and 1,1-DCA at 5 μg/L. PCE and 1,1-DCE were also detected in small concentrations in the area. Second, near the maintenance building (3A) VOCs were detected in Well 1206 at 69 μg/L. Well 1206 had 1,1,1-TCA at 22 μg/L and 1,1-DCA at 29 μg/L. Low levels of PCE, TCE, and 1,1-DCE were also detected. Near Plant 2 (2A) the maximum concentration of total VOCs was found in Well 1412 at 316 μg/L. In Well 1412 1,1,1-TCA was detected at 130 μg/L and 1,1-DCA at 170 μg/L.

Activities in this general area centered on storage of oil and solvent separation and incineration, and storage and maintenance of equipment. VOCs may have entered the subsurface via leaking of below-grade piping or sumps and surface spills.

The fire training area (73) displayed concentrations of VOCs; a maximum total concentration of 794 μg/L was detected in Well 11229, with concentrations of principal solvents 1,1,1-TCA at 82 μg/L, 1,1-DCA at 520 μg/L, and 1,2-DCE at 150 μg/L. Benzene and chloroform were detected but not quantified at Well 1509. Used oils were burned in a pond and a steel trough to simulate liquid process fires for training purposes. VOCs may have entered the subsurface from spills and leaks of these flammable agents.

VOC contamination was also observed in an area just west of the pilot plant. An elevated concentration of VOCs was detected in a Hydropunch™ sample from Boring 11096, (853 μg/L). This well is located near the thorium tank farm which is used for spent solvent storage. Well 1246 showed concentrations of 1,1,1-TCA at 38 μg/L, PCE at 49 μg/L, and TCE at 53 μg/L. Low levels of 1,1-DCE and 1,2-DCE were also detected in Well 1246. VOCs may have entered the subsurface via contaminant leakage from subsurface process equipment.

Four secondary areas of VOC contamination were also observed. These areas are: the Plant 8 scrap recovery plant (8A), the sewage treatment plant, the Plant 1 storage pad (74T), and southeast of Plant 2/3. Maximum concentrations of total VOCs were observed in Well 1234 near Plant 8 at 76 μg/L, Well 1444 near the sewage treatment plant at 112 μg/L, Well 1345 near the Plant 1 pad at 69 μg/L, and Well 1154 southeast of Plant 2/3 at 185 μg/L. VOCs may have entered the subsurface via spills or migration from waste storage or wastewater treatment facilities and sumps. High concentrations of total VOCs are observed in wells in the vicinity of the waste pits; the Operable Unit 1 RI Report (DOE 1994g) describes these releases to perched groundwater.

Based on data from 1993 sampling, VOC contamination of the perched groundwater occurs in various areas of the site. The main originators of most of the VOC contamination were processes that used solvents; storage, treatment, and incineration of waste oils; and environmental degradation of chlorinated aliphatic hydrocarbons.

E.1.3.2 Semivolatile Organic Compounds

Semivolatile organic compounds are a class of organic compounds that includes chemicals characterized by high molecular weight and low vapor pressure, such as polycyclic aromatic hydrocarbons, phenols and assorted coal tar byproducts. Semivolatiles were not analyzed for in unfiltered background samples from perched groundwater; consequently, detection of any semivolatile is considered to be a concentration above background. Phthalates and phenols were the semivolatiles primarily detected in the perched groundwater. Phthalates are common laboratory and/or sampling contaminants. Table E.1-1 presents summary statistics of analyses for individual semivolatile organic compounds.

Plate E-67 is an isoconcentration map of total semivolatile organic compounds detected in unfiltered samples from FEMP Type 1 wells. Contours indicate areas of elevated semivolatile concentrations.

Several elevated concentrations of semivolatiles are observed in wells near the waste pit area. Historical records indicate that Waste Pit 1 received slag leach filter cake, general sump sludge, depleted magnesium fluoride slag, graphite and contaminated brick. Waste Pit 2 received trailer cake, general sump sludge, and uranyl ammonium phosphate filtrate. Waste Pit 3 was the first pit built for settling solids from liquid waste streams. Liquid wastes including storm water from the burn pit, were pumped into Waste Pit 3. After 1964 wastes such as neutralized raffinate, general sump sludge, trailer cake, broken concrete, native fill, wooden pallets, lime sludge and coal flyash were added to Waste Pit 3. Waste Pit 4 received depleted slag, depleted residues, broken concrete, barium chloride, and uncontaminated trash such as cans, asbestos, construction rubble, and crucible molds. The burn pit was initially used as an excavation area to provide clay for the construction of Waste Pits 1 and 2 and was later used to burn materials such as laboratory chemicals, oils, refuse from the cafeteria, and low-level contaminated combustible waste including pyrophoric and reactive chemicals.

E.1.3.3 Total Pesticides

Unfiltered background samples of perched groundwater were not analyzed for pesticides; consequently, any detection is considered an above-background concentration. In unfiltered samples, a pesticide detection was observed in 1 of 129 wells (<1 percent); Well 1615 (3.0 μg/L) near the K-65 silos (Table E.1-1). The pesticide detected was 4,4'-DDT.

E.1.3.4 Total Dioxins and Furans

Unfiltered background samples were not analyzed for dioxins or furans; consequently, any detection is considered to be an above-background concentration. Dioxins were analyzed for in nine unfiltered perched groundwater samples, none were detected (Table E.1-1). An isolated detection of furans was detected in the perched groundwater in the waste pit area at Well 1080 with a total furan concentration of 0.79 ng/L. Three types of furans were present in this well: hexachlorodibenzofurans, pentachlorodibenzofurans, and tetrachlorodibenzofurans, with concentrations of 0.32 ng/L, 0.35 ng/L, and 0.12 ng/L, respectively.

E.1.3.5 Total Herbicides

Unfiltered perched groundwater samples from 30 FEMP type 1 wells were analyzed for herbicides, none were detected (Table E.1-1).

E.1.3.6 Total Organophosphorus Pesticides

Organophosphorus pesticides are not believed to have been used at the FEMP, but were analyzed for in unfiltered samples from 33 FEMP Type 1 wells. No organophosphorus pesticides were detected (Table E.1-1).

E.1.4 GENERAL WATER QUALITY PARAMETERS

E.1.4.1 Alkalinity

Alkalinity is formally defined as the equivalent sum of the bases that are titratable with strong acid (Stumm and Morgan 1981). Alkalinity in the perched groundwater is expressed as total calcium carbonate. In the perched groundwater, the alkalinity increases when high pH solutions enter the subsurface. Additionally, when acids such as nitric, hydrofluoric, phosphoric, hydrochloric, and sulfuric acid react with the carbonate minerals in the glacial till they raise the alkalinity of the perched groundwater. These acids were used throughout the production area.

Alkalinity has a 95th percentile background concentration of 430 mg/L and background values that range from 313 to 430 mg/L (Table E.0-1). Alkalinity values in the perched groundwater range from 0.45 to 1200 mg/L (Table E.1-1).

Values of alkalinity above 500 mg/L were detected in multiple adjacent wells near Plant 2/3, Plant 1, the waste pits, and the sewage treatment plant. The maximum concentrations of alkalinity detected in these areas were 1004.0 mg/L in Well 1201, 1200.0 mg/L in Well 1361, 690.0 mg/L in Well 1011, and 552.5 mg/L in Well 1843, respectively.

Values of alkalinity above 500 mg/L were detected in isolated wells near the solid waste landfill (510.0 mg/L in Well 1947), near the coal pile (554.0 mg/L in Well 1363), near the Plant 9 sump (9I) (670.0 mg/L in Well 1324), south of Plant 6 (526.0 mg/L in Well 1173), and west of Plant 1 (570.0 mg/L in Well 11072).

Alkalinity may be an indicator parameter for areas of contamination or may be indicative of changes in local geochemistry. The detections above background, except possibly for Wells 1173 and 11072, appear to be associated with site activities due to their locations. Potential major sources of perched groundwater contamination are shown in Figure E.0-1. High values of alkalinity probably resulted from high pH solutions which entered the subsurface near these areas. Alternatively, low pH solutions that may have reacted with carbonate soil could result in higher alkalinity in these areas.

E.1.4.2 Ammonia

Ammonia has a 95th percentile background concentration of 4.34 mg/L, and background values that range from 0.1 to 4.5 mg/L (Table E.0-1). Ammonia was detected at above-background concentrations in the 1993 data set in 4 of 181 wells (2 percent) and had a maximum concentration of 220 mg/L (Table E.1-1).

Ammonia concentrations occur above background in the perched groundwater in only two areas at the FEMP. Elevated levels of ammonia were detected in three wells in the waste pit area (2.40 mg/L in Well 1075, 130.0 mg/L in Well 1031, and 220.0 mg/L in Well 1075). One detection (5.33 mg/L) of an above-background concentration of ammonia was detected in Well 1324 near the Plant 9 sump (9I). The potential major sources of perched groundwater contamination are shown in Figure E.0-1.

E.1.4.3 Chloride

Chloride has a 95th percentile background concentration of 45 mg/L and background values that range from 1.4 to 50 mg/L (Table E.0-1). Chloride was detected at above-background concentrations

in the 1993 data set in 54 of 173 wells (31 percent) and had a maximum concentration of 6300 mg/L (Table E.1-1).

Plate E-68 is a contour map of chloride concentrations in unfiltered perched groundwater. In many of the areas where chloride occurs above background, sodium is also detected above background. This is expected because brine solutions composed of sodium chloride were often used at the FEMP.

The highest concentrations of chloride detected in multiple adjacent wells are found in the perched groundwater from wells near the waste pits. The maximum concentration of chloride in this area is 6300 mg/L, 140 times background, in Well 1075. Chloride was detected at concentrations up to 15 times background (698.0 mg/L in Well 1332) in multiple adjacent wells across a wide area from Plant 1 northeast to an area west of the KC-2 warehouse. Additional areas with chloride detected at above-background concentrations in multiple adjacent wells were west of the lime sludge ponds, the K-65 silo area, southeast of Plant 8, southwest of Plant 6, and southwest of Plant 9 and the Plant 9 sump (9I). Maximum concentrations of chloride for these areas were 88.1 mg/L in Well 1042, 3230.0 mg/L in Well 1615, 82.9 mg/L in Well 1167, 218.0 mg/L in Well 1172, and 457.0 mg/L in Well 1117, respectively. Detections of chloride at less than two times background concentrations were found in isolated wells in the sewage treatment plant area (61.0 mg/L in Well 1444), east of Plant 2/3 (69.6 mg/L in Well 1226), and west of Plant 2/3 (83.2 mg/L in Well 1207).

Elevated concentrations of chloride detected in multiple adjacent wells suggest that plumes of chloride contamination are present in the perched groundwater in the areas discussed above. The locations of these plumes and the magnitude of the concentrations suggest that the contamination is due to past site activities. Additional elevated detections in isolated wells across the site may also represent isolated contamination due to site activities, but in some cases may simply be due to variability in background concentrations at the site.

E.1.4.4 Fluoride

Fluoride has a 95th percentile background concentration of 1.3 mg/L and background values that range from 0.2 to 1.3 mg/L (Table E.0-1). Fluoride was detected at above-background concentrations in the 1993 data set in 10 of 170 wells (6 percent) and had a maximum concentration of 6.8 mg/L (Table E.1-1).

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The maximum concentration of fluoride detected in the perched groundwater was from Well 1324 in the Plant 9 sump area (9I). Well 1117 an adjacent well just south of Plant 9, had a detection of 1.67 mg/L, less than two times background. Four wells in the waste pit area had detections of fluoride above background ranging from 2.40 mg/L in Well 1075 to above five times background (6.76 mg/L) in Well 1644. Fluoride was also detected at above-background concentrations in multiple adjacent wells southwest of Plant 7. The concentrations detected were 1.75 mg/L in Well 1840 and 2.20 in Well 1167. One isolated above-background detection of 5.05 mg/L in Well 1785 was found south of Plant 2/3.

Elevated concentrations of fluoride from multiple adjacent wells suggest that fluoride contamination in the perched groundwater in the waste pit area, the Plant 9 area, and southwest of Plant 7 may be due to site activities. Solutions of hydrofluoric acid were used at the site, neutralized with lime, and eventually sent to the waste pits. Solutions may have entered the subsurface in the production area from leaking sumps or below-grade piping. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

E.1.4.5 Nitrate

Nitrate has a 95th percentile background concentration of 0.29 mg/L, and background values that range from 0.012 to 0.3 mg/L (Table E.0-1). Nitrate was detected at above-background concentrations in the 1993 data set in 105 of 253 wells (42 percent) and had a maximum concentration of 2673 mg/L (Table E.1-1).

Plate E-69 is a contour map of nitrate concentrations in unfiltered samples of perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Numerous plumes of elevated concentrations of nitrate are present across the site. The largest area of nitrate contamination in the perched groundwater is in the Plant 2/3 area. Nitrate concentrations range up to a maximum of 2673 mg/L (over 9000 times background) in Well 1785 just south of Plant 2/3 (this well is not shown on the map). Possible sources for nitrate contamination near Plant 2/3 include the ore refinery plant (2A), metal dissolver building (2D), ore digestion activities in the hot raffinate building (3E), scrap recovery plant (8A), and the pilot plant. Nitrate probably entered the subsurface as nitric acid solutions or wastewater that was spilled on floors or leaked from sumps and below-grade piping.

High concentrations of nitrate were also detected in multiple adjacent wells in the perched groundwater in the waste pit area, the K-65 silo area, the pilot plant, the sewage treatment plant, Plant 6, the Plant 9 sump (9I), and near the coal pile runoff basin (18C). The maximum concentrations in these areas ranged from above 60 times background (18.1 mg/L in Well 1444 at the sewage treatment plant) to above 2000 times background (677.0 mg/L in Well 1148 at Plant 6).

Elevated concentrations of nitrate detected in multiple adjacent wells suggest that plumes of nitrate contamination are present in the perched groundwater in the areas discussed above. The locations of these plumes and the magnitude of the concentrations suggest that the contamination is due to past site activities. Additional elevated detections in isolated wells across the site may also represent isolated contamination due to site activities, but in some cases may simply be due to variability in background concentrations at the site.

E.1.4.6 pH

The pH of a water is defined as the negative log of the hydrogen ion concentration. The pH scale ranges from 0 to 14 standard pH units with seven being a neutral pH value. Acidic waters have lower pH values and basic waters have higher pH values. Because the glacial till at the FEMP is principally composed of calcium and magnesium carbonates, the pH of the perched water will be affected by the glacial till. Based on knowledge of the geochemistry of the site, the pH of the water/soil system is expected to be buffered in the range of 7 to 8 by carbonate mineral dissolution, CO_2 dissolution, and bicarbonate acid dissociation. Lower pH values are generally observed in FEMP soil due to the presence of organics. A detailed discussion of the rainwater/soil chemistry is presented in Appendix F.

The pH values measured in samples collected at the FEMP range from 6.68 to 9.94 (Table E.1-1). There were two pH values measured above 8. The maximum value of 9.94 was measured in a sample from Well 1117 south of the Plant 9 sump (9I) and a pH of 8.89 was measured in Well 1031 southeast of the Clearwell (CW).

There was one area with pH values below 7 in multiple adjacent wells east of the South Field (pH 6.68-6.99). Samples from isolated wells had pH measurements below 7 in the waste pit area (pH ranged as low as 6.70 in two wells on the east side and as low as 6.82 in two wells on the west side), the K-65 silo area (pH 6.89 in Well 1032), under Plant 1 (pH 6.90 in Well 1361), and near Plant 6

000070

(6.79 in Well 1149). Additional pH measurements below 7 in isolated wells were found in Well 1018 (pH 6.95) in the southwest corner of the site, Well 1173 (pH 6.94) in the southeast corner of the site, and Well 1041 (pH 6.97) east of the lime sludge ponds.

The low pH values found in the South Field, the waste pit area, the K-65 silo area, under Plant 1, and near Plant 6 may be indicators of impact on the quality of the groundwater from site activities due to their location. However, the two low pH values from wells in the corners of the site and the low pH value from the well east of the lime sludge ponds do not appear to be associated with potential sources and are probably due to variability in pH measurements. The pH measurements used in the FEMP RI were taken in the field during sample collection and there is generally greater variability in field measurements than in values measured in a laboratory. Also, because of the variability of organic content in the perched groundwater, pH may also exhibit a high degree of variability. For these reasons, pH may not be useful as an indicator of impact on the quality of the perched groundwater.

Because carbonate minerals in the glacial till would tend to neutralize acidic waters, very low pH values from acidic solutions or acidic wastewaters that may have entered the perched groundwater are not expected. Groundwater with relatively higher values of pH in multiple adjacent wells, although below pH 8, was measured in wells near the lime sludge ponds and in wells near the outside equipment storage areas (P007). These are areas where neutralized acidic waste solutions were processed or stored. It is possible that these neutralized solutions, having a slightly higher pH, entered the groundwater in these two areas.

E.1.4.7 Phenols

Phenols have a 95th percentile background concentration of 0.03 mg/L and background values that range from 0.007 to 0.03 mg/L (Table E.0-1). Phenols were detected at above-background concentrations in the 1993 data set in 2 of 180 wells (1 percent) and had a maximum concentration of 0.07 mg/L (Table E.1-1).

Plate E-70 is a contour map of phenol concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Phenols were detected at above-background concentrations in two wells. Phenols were detected at 0.051 mg/L in Well 1053 west of the laboratory and at 0.070 mg/L in Well 1149 under Plant 6. These detections were less than three times background in isolated wells. Due to their locations, it is possible that these detections indicate isolated contaminants due to site activities. It is also possible, however, due to their low concentrations, that they represent natural variability in background concentrations.

E.1.4.8 Phosphorus

Phosphorus has a 95th percentile background concentration of 0.18 mg/L and background values that range from 0.026 to 0.18 mg/L (Table E.0-1). Phosphorus was detected in unfiltered samples at above-background concentrations in the 1993 data set in 121 of 165 wells (73 percent) and had a maximum concentration of 180 mg/L (Table E.1-1). Filtered samples of perched groundwater were not analyzed for phosphorus.

Plate E-71 is a contour map of phosphorus concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Elevated concentrations of phosphorus were detected across the site. The largest area of phosphorus contamination in the perched groundwater is seen in the southwest quadrant of the production area. Phosphorus concentrations range up to a maximum of 10.8 mg/L in Well 11069 west of the 6 to 4 reduction facility No. 2. Possible sources for elevated phosphorus concentrations near Plant 2/3 include the ore refinery plant (2A), metal dissolver building (2D), ore digestion activities in the hot raffinate building (3E), scrap recovery plant (8A), and pilot plant. Phosphorus probably entered the subsurface from the use of phosphoric acid solutions or neutralized phosphoric acid waste solutions that were spilled on floors or leaked from sumps and below-grade piping. Another possible source of elevated phosphate in the Plant 2/3 area is spills of tributyl phosphate that was used in the uranium extraction process.

The highest concentration of phosphorus (180 mg/L) was detected in Well 11068 southeast of the K-65 silos. Other areas where phosphorus was measured in high concentrations are contoured on the isoconcentration map. Some of these areas may represent contamination from site activities, but the natural variability of phosphorus in unfiltered groundwater samples may be causing elevated concentrations, especially in the above-background detections in isolated wells. These data indicate

that phosphorus may not be useful as an indicator of impact on the quality of the perched groundwater.

E.1.4.9 Sulfate

Sulfate has a 95th percentile background concentration of 136 mg/L and background values that range from 3 to 175 mg/L (Table E.0-1). Sulfate was detected at above-background concentrations in the 1993 data set in 56 of 171 wells (33 percent) and had a maximum concentration of 6200 mg/L (Table E.1-1).

Plate E-72 is a contour map of sulfate concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Elevated concentrations of sulfate ranging up to a maximum concentration of 1287.0 mg/L (Well 1617) in the K-65 silo area were detected in the perched groundwater across the site. There was one detection of 6200.0 mg/L in Well 1020; however, previous detections of sulfate in this well ranged only from 40 to 124 mg/L. Although the contour map indicates that this is an area of elevated sulfate concentrations, the value is probably a data outlier due to a field or laboratory error.

Other areas with detections of above-background concentrations of sulfate in multiple adjacent wells are the waste pit area, the solid waste landfill, the outside equipment storage area (P007), the sewage treatment plant, east of the Plant 1 pad (74T), and near the coal pile runoff basin (18C). The maximum concentrations in these areas range from above five times background (720.0 mg/L in Well 1075) near the waste pits to slightly above background (138 mg/L in Well 1447) near the sewage treatment plant. The maximum concentrations in the coal pile runoff basin area and the area east of the Plant 1 pad were above three times background (610.0 mg/L in Well 1299 and 528.0 mg/L in Well 1055, respectively). The maximum concentrations of sulfate in the perched groundwater in the outside equipment storage area and the sewage treatment plant were 363.0 mg/L in Well 1089 and 150.0 mg/L in Well 1444, respectively.

Other detections of above-background concentrations of sulfate in the perched groundwater were in isolated wells across the site.

Elevated concentrations of sulfate detected in multiple adjacent wells suggest that plumes of sulfate contamination are present in the perched groundwater in the areas discussed above. The locations of these plumes and the magnitude of the concentrations suggest that the contamination is due to past site activities. Additional elevated detections in isolated wells across the site may also represent isolated contamination due to site activities. Sulfate contamination may be a result of site activities involving the use of sulfuric acid.

E.1.4.10 Total Organic Carbon

Total organic carbon (TOC) measures the concentration of all organic compounds in the perched groundwater. TOC includes humic and fulvic acids commonly found in soil and groundwater.

TOC has a 95th percentile background concentration of 9 mg/L and background values that range from 1.15 to 9 mg/L (Table E.0-1). TOC was detected at above-background concentrations in the 1993 data set in 36 of 177 wells (20 percent) and had a maximum concentration of 246 mg/L (Table E.1-1).

Plate E-73 is a contour map of TOC concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Detections of TOC at above-background concentrations in the perched groundwater extend over much of the production area. Elevated concentrations of TOC were detected in multiple adjacent wells in the outside equipment storage area (P007), the fire training area, and the waste pit area. The maximum concentrations of TOC in these areas were measured in Well 1089 (13.0 mg/L), Well 1511 (30.0 mg/L), and Well 1644 (33.0 mg/L), respectively.

The maximum concentration (246 mg/L) of TOC was collected from Well 1785 just south of Plant 2/3, which is not presented on the isoconcentration map. One detection of TOC (39.9 mg/L in Well 1149) was at a concentration above four times background in an isolated well in Plant 6. Southwest of Plant 6 there was a TOC detection of 12.0 mg/L in Well 1054 and further southwest of Plant 6 a detection of 26.0 mg/L in Well 1173. Other detections at concentrations above two times background were 20.2 mg/L in Well 1324 in the Plant 9 sump area (9I) and 19.0 mg/L in Well 1332 west of the KC-2 warehouse (63). Detections of TOC at concentrations slightly above background were measured in isolated wells across the site.

000074

Elevated concentrations of TOC detected in multiple adjacent wells suggest that the water quality has been affected in the perched groundwater in the areas discussed above. The locations of these areas suggest that the contamination is due to past site activities. Additional elevated detections in isolated wells across the site may also represent isolated contamination due to site activities, or may simply represent naturally occurring variability in the background concentration.

E.1.4.11 Total Organic Halogens

Total organic halogens (TOX) measure the concentration of all halogenated organic compounds in the perched groundwater.

TOX has a 95th percentile background concentration of 0.126 mg/L and background values that range from 0.011 to 0.126 mg/L (Table E.0-1). TOX was detected at above-background concentrations in the 1993 data set in 22 of 173 wells (13 percent) and had a maximum concentration of 305.4 mg/L (Table E.1-1).

Plate E-74 is a contour map of TOX concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

The largest area of elevated concentrations of TOX detected in perched groundwater samples was the southwest corner of the green salt plant to the east side of Plant 8. The highest concentration of TOX detected in this area was greater than 2000 times background (305.400 mg/L from Well 1154). A nearby isolated well southeast of Plant 8 had a high TOX detection of greater than 600 times background (77.400 mg/L in Well 1840). Elevated concentrations of TOX were also detected in multiple adjacent wells in the waste pit area, near Plant 2/3, and near the oil burner/graphite burner pad (10D). The maximum concentrations in these areas were 0.734 mg/L in Well 1031, 68.6 mg/L in Well 1208, and 1.300 mg/L in Well 1287, respectively.

TOX was detected at above-background concentrations in isolated wells in the fire training area (0.450 mg/L in Well 11229); the Plant 9 sump (9I) (0.199 mg/L in Well 1324), under Plant 6 (0.652 mg/L in Well 1149), under Plant 1 (0.480 mg/L in Well 1361), west of the chemical warehouse (0.133 mg/L in Well 1354) and west of the pilot plant (0.230 mg/L in Well 1246).

Elevated concentrations of TOX in multiple adjacent wells suggest that perched groundwater quality has been affected in the areas discussed above. The locations of these areas suggest that the contamination is due to past site activities. Elevated detections in isolated wells in the areas discussed above may also represent isolated contamination due to site activities. Possible sources for TOX contamination include the incinerator building (39A), the oil burner/graphite burner, leakage of sumps and below-grade piping, and spills.

E.1.4.12 Total Organic Nitrogen

Total organic nitrogen (TON) measures the concentration of all nitrogen in the tri-negative valance state. This measurement will detect ammonia and other nitrogen compounds such as amines, but it will not detect nitrate or nitrite.

TON has a 95th percentile background concentration of 0.34 mg/L and background values that range from 0.1 to 1.35 mg/L (Table E.0-1). TON was detected at above-background concentrations in the 1993 data set in 50 of 136 wells (37 percent) and had a maximum concentration of 40 mg/L (Table E.1-1).

Plate E-75 is a contour map of TON concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Detections of TON at above-background concentrations were found in wells across the site particularly in the Plant 2/3 area west to the lime sludge ponds. The maximum concentration detected in this area (5.440 mg/L in Well 1208) was greater than 15 times background. Other areas with high levels of TON in multiple adjacent wells are on the north side of the South Field, waste pit area, the K-65 silo area, north of the Plant 1 pad to west of the KC-2 warehouse, and west of the sewage treatment plant. The maximum concentrations in these areas ranged from 0.798 mg/L in Well 1843 west of the sewage treatment plant up to 40.000 mg/L in Well 1075 in the waste pit area.

Elevated concentrations of TON detected in multiple adjacent wells suggest that nitrogen contamination is present in the perched groundwater in the areas discussed above. The locations of these areas suggest that the contamination is due to past site activities. Additional elevated detections in isolated wells across the site may also represent isolated contamination due to site activities, or may simply represent naturally occurring variability in the background concentration.

E.1.4.13 Total Kjeldahl Nitrogen

Total kjeldahl nitrogen (TKN) measures nitrogen in the tri-negative valance state after ammonia has been removed. This measurement will detect nitrogen compounds such as amines, but it will not detect nitrate, nitrite or ammonia.

TKN has a 95th percentile background concentration of 4.34 mg/L and background values that range from 0.178 to 4.34 mg/L (Table E.0-1). TKN was detected at above-background concentrations in the 1993 data set in 8 of 104 wells (8 percent) and had a maximum concentration of 260 mg/L (Table E.1-1).

Plate E-76 is a contour map of TKN concentrations in unfiltered perched groundwater. Potential major sources of perched groundwater contamination are shown in Figure E.0-1.

Elevated concentrations of TKN were detected in multiple adjacent wells in the waste pit area. The maximum concentration in this area was 260.000 mg/L in Well 1075. Isolated detections of TKN at above-background concentrations were in Well 1324 (6.580 mg/L) near the Plant 9 sump (9I), in Well 1149 (7.270 mg/L) at Plant 6, and in Well 11085 (4.61 mg/L) east of the South Field.

The three areas shown on this map that indicate elevated concentrations of TKN are also areas that have relatively high ammonia concentrations in the perched groundwater. Because sources of organic nitrogen other than ammonia were rarely used in the process area of the FEMP, the TKN analytical procedure may be measuring organic nitrogen compounds that are being converted from ammonia by bacteria in the soils. Samples of the perched groundwater from these same wells also contained high concentrations of TON.

Elevated concentrations of TKN suggest that nitrogen contamination is present in the perched groundwater in the areas discussed above. The locations of these areas suggest that the contamination is due to past site activities.

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	126/148	126/148	9.2	.4 - 44100	.2 - 1	ND
URANIUM-238	pCi/L	UNF	191/211	185/211	11.3	.3 - 39014	.2 - 1	0.8
URANIUM, TOTAL	ug/L	FIL	174/181	169/181	40.25	.29 - 129000	.1 - 1	1.4
URANIUM, TOTAL	ug/L	UNF	273/275	268/275	45.7	.4 - 436000	.1 - .1	1.3
URANIUM-234	pCi/L	FIL	129/147	124/147	8.47	.3 - 42800	.2 - .7	0.6
URANIUM-234	pCi/L	UNF	186/206	175/206	8.72	.001 - 24988	.2 - 1	0.9
THORIUM-230	pCi/L	FIL	45/148	45/148	-	.251 - 24.3	.2 - 1	ND
THORIUM-230	pCi/L	UNF	104/192	38/192	-	.227 - 28	.2 - 4.7	1.3
RADIUM-226	pCi/L	FIL	21/152	21/152	-	1.07 - 16.6	.09 - 1.2	0.9
RADIUM-226	pCi/L	UNF	86/195	86/195	-	1.01 - 35.8	.144 - 25	0.9
LEAD-210	pCi/L	FIL	0/1	0/1	-		3 - 3	NA
LEAD-210	pCi/L	UNF	0/3	0/3	-		3 - 3	NA
POLONIUM-210	pCi/L	UNF	0/2	0/2	-		1.2 - 1.7	NA
URANIUM-235/236	pCi/L	FIL	78/148	78/148	0.5	.236 - 2170	.1 - 1.2	ND
URANIUM-235/236	pCi/L	UNF	100/189	100/189	0.5	.208 - 2488	.1 - 208	ND
THORIUM-232	pCi/L	FIL	14/147	14/147	-	.216 - 10	.1 - 8.5	ND
THORIUM-232	pCi/L	UNF	61/192	53/192	-	.3 - 11.5	.1 - 4.7	0.34
THORIUM, TOTAL	ug/L	FIL	40/71	40/71	1.575	.912 - 10.6	.5 - 9.48	ND
THORIUM, TOTAL	ug/L	UNF	119/173	64/173	2.575	.7 - 23000	.5 - 43	3.1
RADIUM-228	pCi/L	FIL	26/153	26/153	-	3.1 - 16	.033 - 5	2.2
RADIUM-228	pCi/L	UNF	32/190	32/190	-	3.1 - 219	1.49 - 44	3
THORIUM-228	pCi/L	FIL	22/146	22/146	-	.3 - 10	-.014 - 1.03	0.1
THORIUM-228	pCi/L	UNF	92/192	19/192	-	.293 - 14	.2 - 13.8	1.5
NEPTUNIUM-237	pCi/L	FIL	7/36	7/36	-	0 - 1.97	.2508 - 1	NA
NEPTUNIUM-237	pCi/L	UNF	1/106	1/106	-	.6258 - .6258	.2 - 8.6	0.25
PLUTONIUM-239/240	pCi/L	FIL	4/44	4/44	-	.506 - 1	.1564 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	2/116	2/116	-	1 - 1	.094 - 1	ND
PLUTONIUM-238	pCi/L	FIL	4/44	4/44	-	.913 - 1	0 - 1	NA
PLUTONIUM-238	pCi/L	UNF	3/116	3/116	-	.7437 - 1	.1163 - 1	0.075
STRONTIUM-90	pCi/L	FIL	9/49	9/49	-	1.2 - 5	-.115 - 5	NA
STRONTIUM-90	pCi/L	UNF	10/112	7/112	-	1.01 - 7.68	.6 - 5	2
TECHNETIUM-99	pCi/L	FIL	56/138	45/138	-	15.1 - 2670	-1.82 - 30	30
TECHNETIUM-99	pCi/L	UNF	64/170	55/170	-	15.8 - 6130	12 - 35.1	30
RUTHENIUM-106	pCi/L	FIL	0/41	0/41	-		110 - 153	NA
RUTHENIUM-106	pCi/L	UNF	0/109	0/109	-		119 - 165	ND
CESIUM-137	pCi/L	FIL	4/49	4/49	-	5.7 - 20	4 - 21	NA
CESIUM-137	pCi/L	UNF	4/114	4/114	-	4.9 - 20	4 - 73	ND
GROSS ALPHA	pCi/L	FIL	95/125	95/125	15.9	1.42 - 56700	0 - 13.5	NA
GROSS ALPHA	pCi/L	UNF	114/144	114/144	52.5	.5 - 236000	-.532 - 390	NA
GROSS BETA	pCi/L	FIL	98/125	98/125	31.25	4.3 - 44400	0 - 11.1	NA
GROSS BETA	pCi/L	UNF	121/144	121/144	66.7	.54 - 80300	1.6 - 780	NA

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TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ACTINIUM-227	pCi/L	UNF	0/3	0/3	-		1 - 62	NA
PROTACTINIUM-231	pCi/L	UNF	0/3	0/3	-		290 - 348	NA
RADIUM, TOTAL	pCi/L	UNF	2/2	2/2	1	1 - 1		NA
RADIUM-224	pCi/L	UNF	0/3	0/3	-		20 - 21	NA
URANIUM-235	pCi/L	UNF	42/48	42/48	2.8	.015 - 680	1 - 1	NA
URANIUM-236	pCi/L	UNF	39/40	39/40	0.8	.002 - 450	0 - 0	NA
ALUMINUM	mg/L	FIL	73/196	42/196	-	.0144 - 10.4	.0114 - 20	0.123
ALUMINUM	mg/L	UNF	159/174	103/174	4.7	.0427 - 10500	.0193 - 1.64	2.29
ANTIMONY	mg/L	FIL	24/192	19/192	-	.0055 - .0987	.0005 - 45	0.0272
ANTIMONY	mg/L	UNF	21/173	21/173	-	.005 - .135	.0014 - 45	ND
ARSENIC	mg/L	FIL	50/202	1/202	-	.0012 - .191	.001 - .005	0.122
ARSENIC	mg/L	UNF	104/174	7/174	0.0028	.0011 - .432	.001 - .01	0.0194
BARIUM	mg/L	FIL	197/202	2/202	0.0715	.0075 - .589	.0138 - .4	0.451
BARIUM	mg/L	UNF	165/174	5/174	0.133	.0056 - 3.35	.2 - .295	0.454
BERYLLIUM	mg/L	FIL	14/192	13/192	-	.0012 - .0343	.0003 - .01	0.0018
BERYLLIUM	mg/L	UNF	30/173	30/173	-	.0011 - .0231	.0003 - .01	ND
BORON	mg/L	FIL	2/3	2/3	0.427	.427 - .67	.0556 - .0556	NA
BORON	mg/L	UNF	1/2	1/2	-	.62 - .62	.0556 - .0556	NA
CADMIUM	mg/L	FIL	35/202	17/202	-	.0027 - .05	.001 - .0146	0.006
CADMIUM	mg/L	UNF	39/174	39/174	-	.001 - .07	.001 - .01	ND
CALCIUM	mg/L	FIL	203/204	95/204	129	4.65 - 1800	91.6 - 91.6	131
CALCIUM	mg/L	UNF	176/176	99/176	186	24.5 - 4580		172
CHROMIUM	mg/L	FIL	45/201	27/201	-	.0048 - .818	.002 - .02	0.034
CHROMIUM	mg/L	UNF	107/174	107/174	0.0167	.0046 - .82	.002 - .0422	0.0046
COBALT	mg/L	FIL	23/192	23/192	-	.0063 - .0886	.003 - .0257	ND
COBALT	mg/L	UNF	70/173	70/173	-	.0067 - .489	.003 - .0306	ND
COPPER	mg/L	FIL	40/202	22/202	-	.0034 - .298	.002 - .0251	0.019
COPPER	mg/L	UNF	93/174	65/174	0.0128	.0042 - 1.03	.002 - .125	0.0294
CYANIDE	mg/L	FIL	2/121	2/121	-	.0138 - .0295	.002 - .02	ND
CYANIDE	mg/L	UNF	15/208	15/208	-	.002 - .5519	.00002 - .02	ND
IRON	mg/L	FIL	98/203	11/203	-	.0104 - 21.3	.005 - .34	3.58
IRON	mg/L	UNF	163/174	99/174	9.34	.0274 - 1110	.02 - 1.55	6.35
LEAD	mg/L	FIL	36/203	5/203	-	.001 - .0114	.001 - .0069	0.0087
LEAD	mg/L	UNF	112/182	109/182	0.006	.0012 - 1.15	.001 - .0644	0.0016
MAGNESIUM	mg/L	FIL	203/204	97/204	46.8	1.55 - 690	26.9 - 26.9	47.8
MAGNESIUM	mg/L	UNF	176/176	128/176	71.2	3.43 - 1530		50.7
MANGANESE	mg/L	FIL	175/202	95/202	-	.0025 - 35	.001 - .02	0.18
MANGANESE	mg/L	UNF	171/174	130/174	0.673	.0035 - 39.7	.001 - .0178	0.205
MERCURY	mg/L	FIL	7/202	7/202	-	.0002 - .0018	.0001 - .001	ND
MERCURY	mg/L	UNF	10/175	10/175	-	.0002 - .0045	.0001 - .002	ND
MOLYBDENUM	mg/L	FIL	36/146	25/146	-	.0045 - 1.42	.003 - .049	0.017

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TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
MOLYBDENUM	mg/L	UNF	27/118	27/118	-	.0062 - .75	.0041 - .041	ND
NICKEL	mg/L	FIL	41/202	33/202	-	.0037 - .981	.003 - .0936	0.022
NICKEL	mg/L	UNF	96/174	92/174	0.0233	.006 - 1.47	.003 - .0899	0.0072
OSMIUM	mg/L	FIL	0/7	0/7	-		.05 - .128	NA
POTASSIUM	mg/L	FIL	177/203	5/203	-	.38 - 12400	.34 - 1.52	29.3
POTASSIUM	mg/L	UNF	172/177	18/177	-	.468 - 82	.894 - 2.02	17.2
SELENIUM	mg/L	FIL	19/202	19/202	-	.0011 - .0494	.001 - .02	ND
SELENIUM	mg/L	UNF	19/174	19/174	-	.0011 - .0566	.001 - .02	ND
SILICON	mg/L	FIL	90/91	31/91	7.05	3.37 - 15	6.96 - 6.96	7.43
SILICON	mg/L	UNF	62/62	28/62	10.145	3.58 - 83.4		10.7
SILVER	mg/L	FIL	31/202	12/202	-	.0029 - .264	.0005 - .05	0.04
SILVER	mg/L	UNF	38/174	35/174	-	.001 - .138	.001 - .0531	0.0031
SODIUM	mg/L	FIL	203/203	35/203	24	2.35 - 1300		56.3
SODIUM	mg/L	UNF	176/176	36/176	22.1	2.59 - 1040		50
THALLIUM	mg/L	FIL	4/192	4/192	-	.001 - .0028	.001 - .041	ND
THALLIUM	mg/L	UNF	7/173	7/173	-	.001 - .006	.001 - .01	ND
TIN	mg/L	FIL	0/12	0/12	-		.03 - 2	NA
TIN	mg/L	UNF	0/6	0/6	-		1 - 2	NA
VANADIUM	mg/L	FIL	36/195	23/195	-	.0029 - .299	.0029 - .05	0.0195
VANADIUM	mg/L	UNF	101/174	100/174	0.025	.0047 - 3.25	.0029 - .05	0.0051
ZINC	mg/L	FIL	72/195	13/195	-	.002 - 1.78	.0021 - .036	0.0443
ZINC	mg/L	UNF	117/173	21/173	0.04995	.006 - 3380	.004 - .421	0.352
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/26	0/26	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	41/217	41/217	-	.5 - 310	1 - 97	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	3/217	3/217	-	1 - 5	1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	2/217	2/217	-	1 - 2	1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	48/216	48/216	-	1 - 800	1 - 20	NA
1,1-DICHLOROETHENE	ug/L	UNF	24/216	24/216	-	1 - 270	1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	6/216	6/216	-	1 - 72	1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	32/215	32/215	-	.6 - 1000	1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/217	0/217	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	6/216	6/216	-	1 - 20	2 - 50	NA
2-HEXANONE	ug/L	UNF	2/217	2/217	-	1 - 6	2 - 15	NA
4-METHYL-2-PENTANONE	ug/L	UNF	4/217	4/217	-	4 - 18	2 - 10	NA
ACETONE	ug/L	UNF	11/216	11/216	-	2 - 120	2 - 40	NA
BENZENE	ug/L	UNF	4/222	4/222	-	.5 - 4	.5 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	1/217	1/217	-	5 - 5	1 - 10	NA
BROMOFORM	ug/L	UNF	2/217	2/217	-	1 - 2	1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/216	0/216	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	4/216	4/216	-	1 - 9	1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	1/217	1/217	-	21 - 21	1 - 10	NA

000080

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHLOROBENZENE	ug/L	UNF	2/217	2/217	-	1 - 1	1 - 10	NA
CHLOROETHANE	ug/L	UNF	3/215	3/215	-	7 - 24	1 - 10	NA
CHLOROFORM	ug/L	UNF	5/216	5/216	-	2 - 47	1 - 10	NA
CHLOROMETHANE	ug/L	UNF	1/216	1/216	-	.6 - .6	1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/217	0/217	-		1 - 250	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	1/217	1/217	-	1 - 1	1 - 100	NA
ETHYLBENZENE	ug/L	UNF	2/222	2/222	-	2 - 38	.5 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/8	0/8	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	5/216	5/216	-	1 - 19	1 - 87	NA
STYRENE	ug/L	UNF	1/217	1/217	-	3 - 3	1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/6	0/6	-		20 - 100	NA
TETRACHLOROETHENE	ug/L	UNF	22/217	22/217	-	.7 - 2600	1 - 10	NA
TOLUENE	ug/L	UNF	7/222	7/222	-	1 - 50	.5 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/217	0/217	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	26/217	26/217	-	1 - 10000	1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/35	0/35	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	1/177	1/177	-	1 - 1	2 - 250	NA
VINYL CHLORIDE	ug/L	UNF	4/216	4/216	-	7 - 9	1 - 1000	NA
XYLENES, TOTAL	ug/L	UNF	2/222	2/222	-	6 - 17	1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/142	0/142	-		4 - 100	NA
1,2-DICHLOROBENZENE	ug/L	UNF	1/132	1/132	-	4 - 4	10 - 20	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/149	0/149	-		1 - 20	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/149	0/149	-		1 - 100	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/142	0/142	-		4 - 100	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/142	0/142	-		4 - 20	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/142	0/142	-		4 - 20	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/142	0/142	-		4 - 20	NA
2,4-DINITROPHENOL	ug/L	UNF	0/142	0/142	-		4 - 100	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/142	0/142	-		10 - 100	NA
2,6-DINITROTOLUENE	ug/L	UNF	1/142	1/142	-	4 - 4	10 - 20	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/10	0/10	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/63	0/63	-		10 - 60	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
2-CHLOROPHENOL	ug/L	UNF	1/142	1/142	-	160 - 160	4 - 100	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/139	0/139	-		4 - 20	NA
2-METHYLPHENOL	ug/L	UNF	0/142	0/142	-		4 - 20	NA
2-NITROANILINE	ug/L	UNF	0/142	0/142	-		15 - 100	NA
2-NITROPHENOL	ug/L	UNF	1/142	1/142	-	2 - 2	4 - 20	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/143	0/143	-		10 - 40	NA
3-NITROANILINE	ug/L	UNF	0/142	0/142	-		15 - 100	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/142	0/142	-		4 - 100	NA

000081

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/142	0/142	-		10 - 20	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	1/142	1/142	-	200 - 200	4 - 100	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/142	0/142	-		10 - 20	NA
4-METHYLPHENOL	ug/L	UNF	0/132	0/132	-		10 - 20	NA
4-NITROANILINE	ug/L	UNF	0/142	0/142	-		15 - 100	NA
4-NITROPHENOL	ug/L	UNF	2/142	2/142	-	3 - 80	4 - 250	NA
ACENAPHTHENE	ug/L	UNF	1/139	1/139	-	3 - 3	4 - 100	NA
ACENAPHTHYLENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
ANTHRACENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BENZO(A)PYRENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BENZOIC ACID	ug/L	UNF	3/129	3/129	-	3 - 4	2 - 100	NA
BENZYL ALCOHOL	ug/L	UNF	0/132	0/132	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/142	0/142	-		10 - 20	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/142	0/142	-		10 - 20	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/142	0/142	-		4 - 20	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	13/142	13/142	-	.4 - 350	4 - 20	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	2/142	2/142	-	3 - 3	4 - 20	NA
CARBAZOLE	ug/L	UNF	0/48	0/48	-		10 - 20	NA
CHRYSENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
CUMENE	ug/L	UNF	0/30	0/30	-		1 - 5	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	2/142	2/142	-	.4 - 3	4 - 20	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/139	0/139	-		4 - 20	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/141	0/141	-		4 - 20	NA
DIBENZOFURAN	ug/L	UNF	0/142	0/142	-		4 - 20	NA
DIETHYL PHTHALATE	ug/L	UNF	5/142	5/142	-	.6 - 25	4 - 20	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
FLUORANTHENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
FLUORENE	ug/L	UNF	0/142	0/142	-		4 - 50	NA
HEXACHLOROBENZENE	ug/L	UNF	0/142	0/142	-		4 - 25	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
HEXACHLOROETHANE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
ISOPHORONE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	2/142	2/142	-	2 - 8	4 - 100	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/19	0/19	-		4 - 20	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/142	0/142	-		4 - 100	NA

1916
000082

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
NAPHTHALENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
NITROBENZENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
O,O,O-TRIETHYLPHOSPHOROTHIOATE	ug/L	UNF	0/7	0/7	-		10 - 20	NA
P-CHLOROANILINE	ug/L	UNF	0/143	0/143	-		4 - 20	NA
PENTACHLOROPHENOL	ug/L	UNF	2/143	2/143	-	7 - 94	4 - 250	NA
PHENANTHRENE	ug/L	UNF	0/142	0/142	-		4 - 20	NA
PHENOL	ug/L	UNF	7/143	7/143	-	1 - 80	4 - 100	NA
PYRENE	ug/L	UNF	1/142	1/142	-	5 - 5	4 - 100	NA
PYRIDINE	ug/L	UNF	0/16	0/16	-		4 - 4	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	7/46	7/46	-	1 - 410	10 - 15	NA
4,4'-DDD	ug/L	UNF	0/129	0/129	-		.1 - 1	NA
4,4'-DDE	ug/L	UNF	0/129	0/129	-		.1 - 1	NA
4,4'-DDT	ug/L	UNF	1/129	1/129	-	3 - 3	.1 - 1	NA
ALDRIN	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
ALPHA-BHC	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
ALPHA-CHLORDANE	ug/L	UNF	0/119	0/119	-		.05 - 5	NA
AROCLOR-1016	ug/L	UNF	0/129	0/129	-		.2 - 5	NA
AROCLOR-1221	ug/L	UNF	0/129	0/129	-		.2 - 10	NA
AROCLOR-1232	ug/L	UNF	0/129	0/129	-		.2 - 5	NA
AROCLOR-1242	ug/L	UNF	0/129	0/129	-		.2 - 5	NA
AROCLOR-1248	ug/L	UNF	0/129	0/129	-		.2 - 5	NA
AROCLOR-1254	ug/L	UNF	0/129	0/129	-		.2 - 10	NA
AROCLOR-1260	ug/L	UNF	0/129	0/129	-		.2 - 10	NA
BETA-BHC	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
CHLORDANE	ug/L	UNF	0/20	0/20	-		.2 - 1	NA
CHLOROBENZILATE	ug/L	UNF	0/6	0/6	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
DIELDRIN	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
ENDOSULFAN II	ug/L	UNF	0/129	0/129	-		.1 - 1	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/129	0/129	-		.1 - 1	NA
ENDOSULFAN-I	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
ENDRIN	ug/L	UNF	0/132	0/132	-		.05 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/37	0/37	-		.1 - 1	NA
ENDRIN KETONE	ug/L	UNF	0/119	0/119	-		.1 - 1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/133	0/133	-		.05 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/120	0/120	-		.05 - 5	NA
HEPTACHLOR	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/129	0/129	-		.05 - 1	NA
METHOXYCHLOR	ug/L	UNF	0/123	0/123	-		.2 - 200	NA
SULFOTEP	ug/L	UNF	0/11	0/11	-		1 - 15	NA
TOXAPHENE	ug/L	UNF	0/132	0/132	-		.2 - 500	NA

000083

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2,4,5-T	ug/L	UNF	0/9	0/9	-		.1 - 5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/12	0/12	-		.025 - 500	NA
2,4-D	ug/L	UNF	0/12	0/12	-		.05 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/21	0/21	-		.5 - 5	NA
DEMETON	ug/L	UNF	0/21	0/21	-		.2 - 2	NA
DIAZINON	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
DIMETHOATE	ug/L	UNF	0/11	0/11	-		1 - 15	NA
DISULFOTON	ug/L	UNF	0/30	0/30	-		.2 - 15	NA
ETHION	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
FAMPHUR	ug/L	UNF	0/11	0/11	-		1 - 15	NA
MALATHION	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
METHYL PARATHION	ug/L	UNF	0/30	0/30	-		.05 - 15	NA
PARATHION	ug/L	UNF	0/30	0/30	-		.05 - 15	NA
PHORATE	ug/L	UNF	0/11	0/11	-		1 - 15	NA
THIONAZIN	ug/L	UNF	0/11	0/11	-		1 - 15	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.34 - 25	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.22 - 25	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.23 - 25	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.47 - 25	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.18 - .51	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.44 - 25	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.17 - .49	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.4 - 25	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.23 - 25	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.19 - 25	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.28 - 25	NA
1,4-DIOXANE	ng/L	UNF	0/8	0/8	-		1000 - 5000	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.33 - 25	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.31 - 25	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/8	0/8	-		.67 - 10	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ng/L	UNF	0/5	0/5	-		.22 - 10	NA
HEPTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/6	0/6	-		.34 - 25	NA
HEPTACHLORODIBENZOFURANS	ng/L	UNF	0/6	0/6	-		.78 - 25	NA
HEXACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/9	0/9	-		.67 - 25	NA
HEXACHLORODIBENZOFURANS	ng/L	UNF	1/9	1/9	-	.32 - .32	.27 - 1.6	NA
OCTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/6	0/6	-		.23 - 50	NA
OCTACHLORODIBENZOFURAN	ng/L	UNF	0/6	0/6	-		.38 - 50	NA
PENTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/9	0/9	-		.072 - 25	NA
PENTACHLORODIBENZOFURANS	ng/L	UNF	1/9	1/9	-	.35 - .35	.088 - 25	NA
TETRACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/8	0/8	-		.19 - 10	NA
TETRACHLORODIBENZOFURANS	ng/L	UNF	1/9	1/9	-	.12 - .12	.38 - 10	NA

000084

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ALKALINITY AS CACO3	mg/L	UNF	151/152	151/152	380.5	.45 - 1200	440 - 440	NA
ALLYL CHLORIDE	-	UNF	0/26	0/26	-		5 - 20	NA
AMMONIA	mg/L	UNF	100/181	4/181	0.076	.03 - 220	.02 - .4	4.34
BICARBONATE	-	UNF	1/1	1/1	-	560 - 560		NA
BICARBONATE ALKALINITY	-	UNF	40/40	40/40	450	98 - 1200		NA
CARBONATE ALKALINITY	-	UNF	1/41	1/41	-	66 - 66	1 - 30	NA
CHEMICAL OXYGEN DEMAND	-	UNF	1/3	1/3	-	14 - 14	10 - 10	NA
CHLORIDE	mg/L	UNF	169/173	54/173	18	.032 - 6300	2.2 - 13	45
FLUORIDE	mg/L	UNF	170/170	10/170	0.44	.125 - 6.8		1.3
HEXAVALENT CHROMIUM	mg/L	UNF	0/4	0/4	-		.005 - .02	NA
LBPH AS GASOLINE	mg/L	UNF	0/1	0/1	-		.05 - .05	NA
NITRATE	mg/L	UNF	153/253	105/253	0.15	.012 - 2673	.02 - .2	0.29
NITRATE, AS NITROGEN	mg/L	UNF	42/57	42/57	0.075	.02 - 3440	.02 - .1	NA
NITRATE/NITRITE	mg/L	UNF	79/126	60/126	0.07	.02 - 10000	.02 - 50	0.07
NITRITE, AS NITROGEN	mg/L	UNF	9/37	9/37	-	.04 - 122	.02 - .2	NA
OIL AND GREASE	-	UNF	7/7	7/7	2.8	1.44 - 6.4		NA
PH	-	UNF	70/70	70/70	7.25	6.68 - 9.94		NA
PHENOLS	mg/L	UNF	18/180	2/180	-	.002 - .07	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	8/25	8/25	-	.157 - 5.6	.01 - .01	NA
PHOSPHORUS	mg/L	UNF	150/165	150/165	0.455	.02 - 180	.01 - .1	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	69/69	69/69	967.5	340 - 4820		NA
SULFATE	mg/L	UNF	168/171	56/171	94.81	.17 - 6200	.5 - 2	136
SULFIDE	mg/L	UNF	7/127	7/127	-	.62 - 7.87	.1 - 1.1	NA
TOTAL COLIFORM	-	UNF	1/1	1/1	-	325 - 325		NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	54/54	42/54	610	268 - 3440		452
TOTAL KJELDAHL NITROGEN	mg/L	UNF	83/104	8/104	0.38	.1 - 260	.1 - 1.3	4.34
TOTAL ORGANIC CARBON	mg/L	UNF	152/177	36/177	2.39	1 - 246	.01 - 10	9
TOTAL ORGANIC HALIDES	mg/L	UNF	101/173	22/173	0.02	.01 - 305.4	.005 - 10	0.126
TOTAL ORGANIC HALOGENS	mg/L	UNF	19/60	19/60	-	.014 - .56	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	111/136	50/136	0.25	0 - 40	.075 - 1.2	0.34
TOTAL SOLIDS	mg/L	UNF	38/38	38/38	1200	230 - 11900		NA
TOTAL SUSPENDED SOLIDS	mg/L	UNF	0/1	0/1	-		4 - 4	NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/26	0/26	-		1 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/12	0/12	-		4 - 20	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/26	0/26	-		2 - 20	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/26	0/26	-		2 - 20	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
1,3-DINITROBENZENE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/12	0/12	-		15 - 240	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	1/12	1/12	-	4.2 - 4.2	4 - 10	NA

000085

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2,6-DICHLOROPHENOL	ug/L	UNF	0/12	0/12	-		4 - 20	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/26	0/26	-		5 - 20	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/12	0/12	-		4 - 340	NA
2-PICOLINE	ug/L	UNF	0/12	0/12	-		15 - 70	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/12	0/12	-		15 - 80	NA
3-CHLOROPROPENE	ug/L	UNF	0/6	0/6	-		5 - 50	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/12	0/12	-		15 - 30	NA
3-METHYLPHENOL	ug/L	UNF	0/20	0/20	-		4 - 4	NA
4-AMINOBIPHENYL	ug/L	UNF	0/12	0/12	-		15 - 100	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/12	0/12	-		15 - 20	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/12	0/12	-		15 - 40	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
ACETONITRILE	ug/L	UNF	0/8	0/8	-		200 - 2000	NA
ACETOPHENONE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
ACROLEIN	ug/L	UNF	0/26	0/26	-		20 - 50	NA
ACROLEIN	ug/L	UNF	0/26	0/26	-		20 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/26	0/26	-		20 - 50	NA
ALACHLOR	ug/L	UNF	0/3	0/3	-		2000 - 2000	NA
ANILINE	ug/L	UNF	0/12	0/12	-		4 - 10	NA
ARAMITE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
ATRAZINE	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/3	0/3	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
DIALLATE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/12	0/12	-		1 - 10	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/26	0/26	-		1 - 10	NA
DINOSEB	ug/L	UNF	0/9	0/9	-		.5 - 20	NA
DIPHENYLAMINE	ug/L	UNF	0/16	0/16	-		15 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/26	0/26	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/26	0/26	-		5 - 20	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
FONOFOS	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
HEXACHLOROPHENE	ug/L	UNF	0/12	0/12	-		4 - 1000	NA
HEXACHLOROPROPENE	ug/L	UNF	0/12	0/12	-		4 - 20	NA
IODOMETHANE	ug/L	UNF	0/26	0/26	-		5 - 20	NA
ISODRIN	ug/L	UNF	0/12	0/12	-		.05 - 4	NA
ISOSAFROLE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
KEPONE	ug/L	UNF	0/12	0/12	-		.1 - 4	NA
LINURON	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA

TABLE E.1-1
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
METHACRYLONITRILE	ug/L	UNF	0/26	0/26	-		5 - 20	NA
METHAPYRILENE	ug/L	UNF	0/12	0/12	-		15 - 40	NA
METHYL METHACRYLATE	ug/L	UNF	0/26	0/26	-		5 - 20	NA
METHYL METHANESULFONATE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
METOLACHLOR	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/12	0/12	-		4 - 40	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	1/12	1/12	-	4 - 4	4 - 10	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/12	0/12	-		4 - 20	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/12	0/12	-		15 - 60	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/12	0/12	-		15 - 50	NA
PENTACHLOROBENZENE	ug/L	UNF	0/12	0/12	-		4 - 20	NA
PENTACHLOROETHANE	ug/L	UNF	0/26	0/26	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/12	0/12	-		4 - 20	NA
PHENACETIN	ug/L	UNF	0/12	0/12	-		4 - 10	NA
PRONAMIDE	ug/L	UNF	0/12	0/12	-		15 - 30	NA
SAFROLE	ug/L	UNF	0/12	0/12	-		10 - 20	NA
SIMIZINE	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
TERBUFOS	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/62	0/62	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/25	0/25	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.

(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.

(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.

(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000087

TABLE E.1-2
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	77/89	77/89	20.4	.5 - 44100	.2 - 1	ND
URANIUM-238	pCi/L	UNF	111/121	108/121	34.2	.3 - 39014	.2 - .2	0.8
URANIUM, TOTAL	ug/L	FIL	114/117	111/117	91.7	.29 - 129000	.1 - 1	1.4
URANIUM, TOTAL	ug/L	UNF	175/175	173/175	129	.4 - 436000		1.3
URANIUM-234	pCi/L	FIL	79/88	76/88	19.4	.3 - 42800		0.6
URANIUM-234	pCi/L	UNF	109/121	102/121	27	.001 - 24988	.2 - .2	0.9
THORIUM-230	pCi/L	FIL	31/89	31/89	-	.3 - 24.3	.2 - 1	ND
THORIUM-230	pCi/L	UNF	67/106	24/106	0.5	.251 - 12	.2 - 4.7	1.3
RADIUM-226	pCi/L	FIL	13/91	13/91	-	1.1 - 16.6	.9 - 1.2	0.9
RADIUM-226	pCi/L	UNF	55/105	55/105	1.1	1.01 - 8.3	.144 - 1	0.9
URANIUM-235/236	pCi/L	FIL	56/89	56/89	0.9	.3 - 2170	.1 - 1.2	ND
URANIUM-235/236	pCi/L	UNF	68/104	68/104	1.4	.3 - 2488	.1 - 208	ND
THORIUM-232	pCi/L	FIL	9/88	9/88	-	.2425 - 10	.1 - 8.5	ND
THORIUM-232	pCi/L	UNF	39/106	33/106	-	.3 - 11.3	.1 - 4.7	0.34
THORIUM, TOTAL	ug/L	FIL	25/42	25/42	1.65	.912 - 8.77	.5 - 7.5	ND
THORIUM, TOTAL	ug/L	UNF	73/93	38/93	2.74	.912 - 23000	.7 - 43	3.1
RADIUM-228	pCi/L	FIL	17/92	17/92	-	3.1 - 16	1.5 - 5	2.2
RADIUM-228	pCi/L	UNF	22/105	22/105	-	3.1 - 219	1.49 - 3.3	3
THORIUM-228	pCi/L	FIL	18/87	18/87	-	.3 - 10	.2 - 1	0.1
THORIUM-228	pCi/L	UNF	63/106	10/106	0.4	.3 - 5.99	.2 - 13	1.5
NEPTUNIUM-237	pCi/L	FIL	3/17	3/17	-	1 - 1.97	.5 - 1	NA
NEPTUNIUM-237	pCi/L	UNF	0/45	0/45	-		.2 - 8.6	0.25
PLUTONIUM-239/240	pCi/L	FIL	3/22	3/22	-	.506 - 1	.5 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/46	0/46	-		.094 - 1	ND
PLUTONIUM-238	pCi/L	FIL	3/22	3/22	-	.913 - 1	.5 - 1	NA
PLUTONIUM-238	pCi/L	UNF	1/46	1/46	-	.7437 - .7437	.1163 - 1	0.075
STRONTIUM-90	pCi/L	FIL	5/24	5/24	-	2.09 - 5	1 - 5	NA
STRONTIUM-90	pCi/L	UNF	2/42	1/42	-	1.01 - 7.68	.6 - 5	2
TECHNETIUM-99	pCi/L	FIL	37/81	30/81	-	15.1 - 2670	13.5 - 30	30
TECHNETIUM-99	pCi/L	UNF	46/92	41/92	20.85	17.2 - 6130	12 - 30	30
RUTHENIUM-106	pCi/L	FIL	0/22	0/22	-		150 - 150	NA
RUTHENIUM-106	pCi/L	UNF	0/44	0/44	-		119 - 165	ND
CESIUM-137	pCi/L	FIL	2/25	2/25	-	20 - 20	4 - 21	NA
CESIUM-137	pCi/L	UNF	0/45	0/45	-		4 - 73	ND
GROSS ALPHA	pCi/L	FIL	66/82	66/82	51.8	3.3 - 56700	.8 - 12.2	NA
GROSS ALPHA	pCi/L	UNF	71/80	71/80	70.1	.5 - 236000	4.9 - 130	NA
GROSS BETA	pCi/L	FIL	64/82	64/82	46.4	4.3 - 44400	1.2 - 11.1	NA
GROSS BETA	pCi/L	UNF	72/80	72/80	84.4	.54 - 80300	1.6 - 370	NA
URANIUM-235	pCi/L	UNF	36/36	36/36	0.93	.13 - 680		NA
URANIUM-236	pCi/L	UNF	35/36	35/36	5.25	.005 - 450	0 - 0	NA
ALUMINUM	mg/L	FIL	46/119	26/119	-	.0374 - 10.4	.014 - 20	0.123
ALUMINUM	mg/L	UNF	95/96	66/96	10.22	.0662 - 10500	.276 - .276	2.29
ANTIMONY	mg/L	FIL	12/116	10/116	-	.0055 - .0873	.0005 - 45	0.0272
ANTIMONY	mg/L	UNF	11/95	11/95	-	.005 - .135	.005 - 45	ND
ARSENIC	mg/L	FIL	25/119	0/119	-	.0014 - .0324	.001 - .005	0.122
ARSENIC	mg/L	UNF	55/96	3/96	0.0025	.0011 - .432	.001 - .0074	0.0194
BARIUM	mg/L	FIL	116/119	1/119	0.0063	.0075 - .589	.0138 - .2	0.451
BARIUM	mg/L	UNF	89/96	83/96	0.157	.0056 - 2.71	.2 - .295	0.0454
BERYLLIUM	mg/L	FIL	10/116	9/116	-	.0012 - .0343	.0003 - .01	0.0018
BERYLLIUM	mg/L	UNF	18/95	18/95	-	.0011 - .0113	.0003 - .01	ND
BORON	mg/L	FIL	1/1	1/1	-	.427 - .427		NA
CADMIUM	mg/L	FIL	19/119	6/119	-	.0027 - .04	.001 - .0146	0.006
CADMIUM	mg/L	UNF	24/96	24/96	-	.001 - .07	.001 - .01	ND

TABLE E.1-2

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	FIL	120/121	58/121	130	4.65 - 841	91.6 - 91.6	131
CALCIUM	mg/L	UNF	96/96	63/96	221	24.5 - 2030		172
CHROMIUM	mg/L	FIL	22/118	16/118	-	.009 - .818	.002 - .02	0.034
CHROMIUM	mg/L	UNF	66/96	66/96	-	.0059 - .492	.0038 - .0422	0.0046
COBALT	mg/L	FIL	9/116	9/116	-	.0065 - .0886	.0034 - .0257	ND
COBALT	mg/L	UNF	44/95	44/95	-	.0067 - .156	.0034 - .0306	ND
COPPER	mg/L	FIL	25/119	13/119	-	.0034 - .298	.0024 - .0251	0.019
COPPER	mg/L	UNF	56/96	41/96	0.022	.0042 - .572	.0028 - .125	0.0294
CYANIDE	mg/L	FIL	1/75	1/75	-	.0138 - .0138	.002 - .02	ND
CYANIDE	mg/L	UNF	8/119	8/119	-	.0027 - .5519	.001 - .02	ND
IRON	mg/L	FIL	57/120	0/120	0.027	.0104 - 20.4	.005 - .34	3058
IRON	mg/L	UNF	93/96	62/96	19.55	.0274 - 860	.02 - .171	6.35
LEAD	mg/L	FIL	22/120	3/120	-	.0011 - .0114	.001 - .0069	0.0087
LEAD	mg/L	UNF	70/104	69/104	0.008	.0012 - .332	.001 - .0644	0.0016
MAGNESIUM	mg/L	FIL	120/121	51/121	41.4	1.55 - 217	26.9 - 26.9	47.8
MAGNESIUM	mg/L	UNF	96/96	73/96	75.1	3.43 - 684		50.7
MANGANESE	mg/L	FIL	107/119	61/119	0.185	.0036 - 9.03	.0017 - .015	0.18
MANGANESE	mg/L	UNF	96/96	81/96	1.03	.0035 - 39.7		0.205
MERCURY	mg/L	FIL	4/119	4/119	-	.0002 - .0018	.0001 - .0003	ND
MERCURY	mg/L	UNF	6/97	6/97	-	.0002 - .0045	.0001 - .002	ND
MOLYBDENUM	mg/L	FIL	12/69	10/69	-	.01 - 1.42	.01 - .045	0.017
MOLYBDENUM	mg/L	UNF	6/52	6/52	-	.0125 - .073	.01 - .041	ND
NICKEL	mg/L	FIL	19/119	16/119	-	.0084 - .227	.005 - .0384	0.022
NICKEL	mg/L	UNF	57/96	53/96	0.025	.006 - .616	.005 - .0814	0.0072
POTASSIUM	mg/L	FIL	101/120	3/120	1.74	.437 - 12400	.34 - 1.52	29.3
POTASSIUM	mg/L	UNF	95/97	9/97	4.99	.468 - 45.8	1.3 - 2.02	17.2
SELENIUM	mg/L	FIL	10/119	10/119	-	.0011 - .0062	.001 - .005	ND
SELENIUM	mg/L	UNF	9/96	9/96	-	.0011 - .0063	.001 - .02	ND
SILICON	mg/L	FIL	47/48	14/48	6.71	3.85 - 12.1	6.96 - 6.96	7.43
SILICON	mg/L	UNF	23/23	8/23	8.62	3.58 - 60.1		10.7
SILVER	mg/L	FIL	19/119	9/119	-	.0029 - .264	.0005 - .01	0.04
SILVER	mg/L	UNF	17/96	16/96	-	.001 - .0818	.001 - .0531	0.0031
SODIUM	mg/L	FIL	120/120	32/120	23.35	2.35 - 255		38.3
SODIUM	mg/L	UNF	96/96	16/96	21.5	2.59 - 283		50
THALLIUM	mg/L	FIL	2/116	2/116	-	.0027 - .0028	.001 - .01	ND
THALLIUM	mg/L	UNF	5/95	5/95	-	.001 - .002	.001 - .01	ND
TIN	mg/L	FIL	0/1	0/1	-		1 - 1	NA
TIN	mg/L	UNF	0/1	0/1	-		1 - 1	NA
VANADIUM	mg/L	FIL	20/118	12/118	-	.0032 - .299	.0029 - .05	0.0195
VANADIUM	mg/L	UNF	62/96	62/96	0.028	.0051 - .62	.0029 - .05	0.0051
ZINC	mg/L	FIL	42/118	6/118	-	.002 - .758	.003 - .0344	0.0443
ZINC	mg/L	UNF	70/95	11/95	-	.0065 - 2.29	.004 - .421	0.352
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/8	0/8	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	34/127	34/127	-	.5 - 310	1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/127	0/127	-		1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	1/127	1/127	-	1 - 1	1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	36/126	36/126	-	1 - 800	1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	19/126	19/126	-	1 - 270	1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	6/126	6/126	-	1 - 72	1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	18/125	18/125	-	1 - 1000	1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/127	0/127	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	3/126	3/126	-	1 - 10	2 - 50	NA
2-HEXANONE	ug/L	UNF	0/127	0/127	-		2 - 10	NA

680000

TABLE E.1-2
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-METHYL-2-PENTANONE	ug/L	UNF	1/127	1/127	-	4 - 4	2 - 10	NA
ACETONE	ug/L	UNF	4/126	4/126	-	2 - 21.1	2 - 40	NA
BENZENE	ug/L	UNF	2/132	2/132	-	.5 - .68	.5 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	1/127	1/127	-	5 - 5	1 - 10	NA
BROMOFORM	ug/L	UNF	1/127	1/127	-	1 - 1	1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/126	0/126	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	3/126	3/126	-	1 - 2	1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	1/127	1/127	-	21 - 21	1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/127	0/127	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	1/126	1/126	-	7 - 7	1 - 10	NA
CHLOROFORM	ug/L	UNF	4/126	4/126	-	2 - 47	1 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/126	0/126	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/127	0/127	-		1 - 250	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	1/127	1/127	-	1 - 1	1 - 100	NA
ETHYLBENZENE	ug/L	UNF	2/132	2/132	-	2 - 38	.5 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/1	0/1	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	0/126	0/126	-		1 - 87	NA
STYRENE	ug/L	UNF	0/127	0/127	-		1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/1	0/1	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	15/127	15/127	-	.7 - 2600	1 - 10	NA
TOLUENE	ug/L	UNF	4/132	4/132	-	2 - 50	.5 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/127	0/127	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	17/127	17/127	-	1 - 10000	1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/8	0/8	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	1/99	1/99	-	1 - 1	2 - 250	NA
VINYL CHLORIDE	ug/L	UNF	2/126	2/126	-	7 - 8	1 - 1000	NA
XYLENES, TOTAL	ug/L	UNF	1/132	1/132	-	17 - 17	1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/68	0/68	-		4 - 100	NA
1,2-DICHLOROBENZENE	ug/L	UNF	1/65	1/65	-	4 - 4	10 - 10	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/69	0/69	-		1 - 10	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/69	0/69	-		1 - 100	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/68	0/68	-		4 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/68	0/68	-		4 - 10	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/68	0/68	-		4 - 10	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/68	0/68	-		4 - 10	NA
2,4-DINITROPHENOL	ug/L	UNF	0/68	0/68	-		4 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/68	0/68	-		10 - 100	NA
2,6-DINITROTOLUENE	ug/L	UNF	1/68	1/68	-	4 - 4	10 - 15	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/4	0/4	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/26	0/26	-		10 - 10	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
2-CHLOROPHENOL	ug/L	UNF	1/68	1/68	-	160 - 160	4 - 100	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
2-METHYLPHENOL	ug/L	UNF	0/68	0/68	-		4 - 10	NA
2-NITROANILINE	ug/L	UNF	0/68	0/68	-		15 - 50	NA
2-NITROPHENOL	ug/L	UNF	1/68	1/68	-	2 - 2	4 - 10	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/69	0/69	-		10 - 20	NA
3-NITROANILINE	ug/L	UNF	0/68	0/68	-		15 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/68	0/68	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/68	0/68	-		10 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	1/68	1/68	-	200 - 200	4 - 100	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/68	0/68	-		10 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/65	0/65	-		10 - 10	NA

6161
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TABLE E.1-2
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-NITROANILINE	ug/L	UNF	0/68	0/68	-		15 - 50	NA
4-NITROPHENOL	ug/L	UNF	1/68	1/68	-	80 - 80	4 - 250	NA
ACENAPHTHENE	ug/L	UNF	1/68	1/68	-	3 - 3	4 - 100	NA
ACENAPHTHYLENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
ANTHRACENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BENZO(A)PYRENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BENZOIC ACID	ug/L	UNF	2/65	2/65	-	3 - 3	2 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/64	0/64	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/68	0/68	-		10 - 15	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/68	0/68	-		10 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	5/68	5/68	-	2 - 6	4 - 16	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	0/23	0/23	-		10 - 10	NA
CARBAZOLE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
CHRYSENE	ug/L	UNF	0/7	0/7	-		1 - 1	NA
CUMENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
DIBENZOFURAN	ug/L	UNF	0/68	0/68	-		4 - 10	NA
DIETHYL PHTHALATE	ug/L	UNF	1/68	1/68	-	25 - 25	4 - 10	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
FLUORANTHENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
FLUORENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
HEXACHLOROBENZENE	ug/L	UNF	0/68	0/68	-		4 - 50	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
HEXACHLOROETHANE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
ISOPHORONE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	1/68	1/68	-	2 - 2	4 - 100	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/2	0/2	-		10 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
NAPHTHALENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
NITROBENZENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/69	0/69	-		4 - 10	NA
PENTACHLOROPHENOL	ug/L	UNF	1/69	1/69	-	94 - 94	4 - 250	NA
PHENANTHRENE	ug/L	UNF	0/68	0/68	-		4 - 10	NA
PHENOL	ug/L	UNF	4/68	4/68	-	1 - 80	4 - 100	NA
PYRENE	ug/L	UNF	1/68	1/68	-	5 - 5	4 - 100	NA
PYRIDINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	5/28	5/28	-	5 - 410	10 - 15	NA
4,4'-DDD	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
4,4'-DDE	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
4,4'-DDT	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
ALDRIN	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
ALPHA-BHC	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
ALPHA-CHLORDANE	ug/L	UNF	0/61	0/61	-		.05 - 5	NA
AROCLOR-1016	ug/L	UNF	0/64	0/64	-		.2 - 5	NA

000091

TABLE E.1-2
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
AROCLOR-1221	ug/L	UNF	0/64	0/64	-		.2 - 5	NA
AROCLOR-1232	ug/L	UNF	0/64	0/64	-		.2 - 5	NA
AROCLOR-1242	ug/L	UNF	0/64	0/64	-		.2 - 5	NA
AROCLOR-1248	ug/L	UNF	0/64	0/64	-		.2 - 5	NA
AROCLOR-1254	ug/L	UNF	0/64	0/64	-		.2 - 10	NA
AROCLOR-1260	ug/L	UNF	0/64	0/64	-		.2 - 10	NA
BETA-BHC	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
CHLORDANE	ug/L	UNF	0/5	0/5	-		.2 - .2	NA
CHLOROBENZILATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
DIELDRIN	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
ENDOSULFAN II	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
ENDOSULFAN-I	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
ENDRIN	ug/L	UNF	0/64	0/64	-		.1 - 1	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/8	0/8	-		.1 - .2	NA
ENDRIN KETONE	ug/L	UNF	0/61	0/61	-		.1 - 1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/65	0/65	-		.05 - .5	NA
GAMMA-CHLORDANE	ug/L	UNF	0/62	0/62	-		.05 - 5	NA
HEPTACHLOR	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/64	0/64	-		.05 - .5	NA
METHOXYCHLOR	ug/L	UNF	0/61	0/61	-		.5 - 5	NA
SULFOTEP	ug/L	UNF	0/1	0/1	-		15 - 15	NA
TOXAPHENE	ug/L	UNF	0/64	0/64	-		.5 - 10	NA
2,4,5-T	ug/L	UNF	0/1	0/1	-		2.5 - 2.5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/1	0/1	-		2.5 - 2.5	NA
2,4-D	ug/L	UNF	0/1	0/1	-		5 - 5	NA
AZINPHOSMETHYL	ug/L	UNF	0/2	0/2	-		.5 - 5	NA
DEMETON	ug/L	UNF	0/2	0/2	-		.2 - 1	NA
DIAZINON	ug/L	UNF	0/2	0/2	-		.2 - .5	NA
DIMETHOATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DISULFOTON	ug/L	UNF	0/3	0/3	-		.2 - 15	NA
ETHION	ug/L	UNF	0/2	0/2	-		.5 - .5	NA
FAMPHUR	ug/L	UNF	0/1	0/1	-		15 - 15	NA
MALATHION	ug/L	UNF	0/2	0/2	-		.2 - 1	NA
METHYL PARATHION	ug/L	UNF	0/3	0/3	-		.2 - 15	NA
PARATHION	ug/L	UNF	0/3	0/3	-		.2 - 15	NA
PHORATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
THIONAZIN	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.34 - .34	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.22 - .22	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.28 - .28	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.47 - .47	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.51 - .51	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.44 - .44	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.49 - .49	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.4 - .4	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.61 - .61	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.19 - .19	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.55 - .55	NA
1,4-DIOXANE	ng/L	UNF	0/1	0/1	-		5000 - 5000	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.53 - .53	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.54 - .54	NA

1919
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TABLE E.1-2
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.67 - .67	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.22 - .22	NA
HEPTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		.34 - .34	NA
HEPTACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.88 - .88	NA
HEXACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		1.6 - 1.6	NA
HEXACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.53 - .53	NA
OCTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		.23 - .23	NA
OCTACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.51 - .51	NA
PENTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		2.6 - 2.6	NA
PENTACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.54 - .54	NA
TETRACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		.27 - .27	NA
TETRACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.58 - .58	NA
ALKALINITY AS CACO3	mg/L	UNF	78/78	78/78	381	94 - 1200		NA
ALLYL CHLORIDE	-	UNF	0/8	0/8	-		5 - 20	NA
AMMONIA	mg/L	UNF	57/97	1/97	0.073	.03 - 5.33	.02 - .4	4.34
BICARBONATE ALKALINITY	-	UNF	19/19	19/19	430	195 - 1200		NA
CARBONATE ALKALINITY	-	UNF	0/19	0/19	-		3 - 30	NA
CHLORIDE	mg/L	UNF	85/86	25/86	17.95	1.7 - 698	6.3 - 6.3	45
FLUORIDE	mg/L	UNF	85/85	4/85	0.44	.125 - 6.8		1.3
LBPH AS GASOLINE	mg/L	UNF	0/1	0/1	-		.05 - .05	NA
NITRATE	mg/L	UNF	103/174	80/174	0.21	.03 - 677	.02 - .2	0.29
NITRATE, AS NITROGEN	mg/L	UNF	14/19	14/19	0.17	.02 - 3440	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	47/72	37/72	0.115	.02 - 18.7	.02 - .26	0.07
NITRITE, AS NITROGEN	mg/L	UNF	6/18	6/18	-	.09 - 122	.02 - .2	NA
OIL AND GREASE	-	UNF	7/7	7/7	2.8	1.44 - 6.4		NA
PH	-	UNF	34/34	34/34	7.3	6.79 - 9.94		NA
PHENOLS	mg/L	UNF	11/96	2/96	-	.003 - .07	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	4/13	4/13	-	.157 - 5.6		NA
PHOSPHORUS	mg/L	UNF	80/86	80/86	0.755	.08 - 39.8	.02 - .03	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	33/33	33/33	9.23	447 - 2910		NA
SULFATE	mg/L	UNF	84/84	20/84	84.7	2.3 - 751		136
SULFIDE	mg/L	UNF	3/68	3/68	-	.62 - 6	.1 - 1.1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	17/17	13/17	565	324 - 2540		452
TOTAL KJELDAHL NITROGEN	mg/L	UNF	30/40	2/40	0.5	.142 - 7.27	.1 - 1.3	4.34
TOTAL ORGANIC CARBON	mg/L	UNF	84/98	14/98	2.4	1 - 39.9	1 - 10	9
TOTAL ORGANIC HALIDES	mg/L	UNF	60/90	14/90	0.02	.01 - 305.4	.005 - .05	0.126
TOTAL ORGANIC HALOGENS	mg/L	UNF	4/22	4/22	-	.03 - .047	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	49/60	26/60	0.3	0 - 5.44	.075 - 1.2	0.34
TOTAL SOLIDS	mg/L	UNF	19/19	19/19	1770	510 - 11900		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/8	0/8	-		1 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/8	0/8	-		2 - 20	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/8	0/8	-		2 - 20	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/8	0/8	-		5 - 20	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-PICOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA

000093

TABLE E.1-2
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLPHENOL	ug/L	UNF	0/5	0/5	-		4 - 4	NA
4-AMINOBIPHENYL	ug/L	UNF	0/1	0/1	-		15 - 15	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACETONITRILE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACROLEIN	ug/L	UNF	0/8	0/8	-		20 - 50	NA
ACROLEIN	ug/L	UNF	0/8	0/8	-		20 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/8	0/8	-		20 - 50	NA
ANILINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ARAMITE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DIALLATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/8	0/8	-		1 - 10	NA
DINOSEB	ug/L	UNF	0/1	0/1	-		2.5 - 2.5	NA
DIPHENYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/8	0/8	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/8	0/8	-		5 - 20	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
HEXACHLOROPHENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
HEXACHLOROPROPENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
IODOMETHANE	ug/L	UNF	0/8	0/8	-		5 - 20	NA
ISODRIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ISOSAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
KEPONE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
METHACRYLONITRILE	ug/L	UNF	0/8	0/8	-		5 - 20	NA
METHAPYRILENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METHYL METHACRYLATE	ug/L	UNF	0/8	0/8	-		5 - 20	NA
METHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
PENTACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PENTACHLOROETHANE	ug/L	UNF	0/8	0/8	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PHENACETIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PRONAMIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
SAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/25	0/25	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/7	0/7	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.

000094

TABLE E.1-2

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA I

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000095

TABLE E.1-3
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA II

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	8/9	8/9	2.5	1.3 - 101		ND
URANIUM-238	pCi/L	UNF	8/8	8/8	2.8	1.2 - 97.2		0.8
URANIUM, TOTAL	ug/L	FIL	9/9	9/9	8.2	3.49 - 273		1.4
URANIUM, TOTAL	ug/L	UNF	9/9	9/9	8	2.3 - 289		1.3
URANIUM-234	pCi/L	FIL	8/9	8/9	3.5	1.8 - 88.3		0.6
URANIUM-234	pCi/L	UNF	8/8	8/8	3.5	1.3 - 91		0.9
THORIUM-230	pCi/L	FIL	0/7	0/7	-		.2 - .3	ND
THORIUM-230	pCi/L	UNF	6/8	1/8	0.55	.3 - 1.5	.2 - .2	1.3
RADIUM-226	pCi/L	FIL	2/9	2/9	-	1.2 - 1.2	1 - 1.2	0.9
RADIUM-226	pCi/L	UNF	4/8	4/8	-	1.5 - 2.7	1 - 1	0.9
URANIUM-235/236	pCi/L	FIL	5/9	5/9	0.24	.24 - 3.1	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	4/8	4/8	-	.3 - 4.2	.2 - .41	ND
THORIUM-232	pCi/L	FIL	0/7	0/7	-		.2 - .3	ND
THORIUM-232	pCi/L	UNF	4/8	3/8	-	.3 - .9	.2 - .4	0.34
THORIUM, TOTAL	ug/L	FIL	1/1	1/1	-	1.824 - 1.824		ND
THORIUM, TOTAL	ug/L	UNF	4/6	2/6	2.09	.912 - 8.2082	2.04 - 2.9	3.1
RADIUM-228	pCi/L	FIL	0/9	0/9	-		3 - 3.4	2.2
RADIUM-228	pCi/L	UNF	1/8	1/8	-	3.5 - 3.5	3 - 3	3
THORIUM-228	pCi/L	FIL	0/7	0/7	-		.2 - .3	0.1
THORIUM-228	pCi/L	UNF	4/8	0/8	-	.5 - 1.04	.2 - .3	1.5
NEPTUNIUM-237	pCi/L	FIL	0/2	0/2	-		.5 - .5	not tested
PLUTONIUM-239/240	pCi/L	FIL	0/2	0/2	-		.5 - .5	ND
PLUTONIUM-239/240	pCi/L	UNF	0/2	0/2	-		.5 - .5	ND
PLUTONIUM-238	pCi/L	FIL	0/2	0/2	-		.5 - .5	not tested
PLUTONIUM-238	pCi/L	UNF	0/2	0/2	-		.5 - .5	0.075
STRONTIUM-90	pCi/L	FIL	0/3	0/3	-		1 - 1.7	not tested
STRONTIUM-90	pCi/L	UNF	0/2	0/2	-		1 - 1	2
TECHNETIUM-99	pCi/L	FIL	4/8	4/8	-	223 - 1610	15 - 21.4	30
TECHNETIUM-99	pCi/L	UNF	4/7	4/7	106	106 - 2880	15 - 16	30
RUTHENIUM-106	pCi/L	FIL	0/2	0/2	-		150 - 150	not tested
RUTHENIUM-106	pCi/L	UNF	0/2	0/2	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	1/3	1/3	-	5.7 - 5.7	15.4 - 16	not tested
CESIUM-137	pCi/L	UNF	0/2	0/2	-		12.2 - 15.3	ND
GROSS ALPHA		FIL	6/7	6/7	8.6	5.5 - 147	2.6 - 2.6	NA
GROSS ALPHA		UNF	6/6	6/6	40.2	5.3 - 179		NA
GROSS BETA		FIL	5/7	5/7	82	7.4 - 1530	4 - 7.5	NA
GROSS BETA		UNF	5/6	5/6	212.5	6.85 - 1830	7 - 7	NA
ALUMINUM	mg/L	FIL	1/9	1/9	-	3.48 - 3.48	.014 - .185	0.123
ALUMINUM	mg/L	UNF	6/7	6/7	22.4	3 - 35.3	.406 - .406	2.29
ANTIMONY	mg/L	FIL	0/9	0/9	-		.005 - .045	0.0272
ANTIMONY	mg/L	UNF	0/7	0/7	-		.014 - .045	ND
ARSENIC	mg/L	FIL	2/9	0/9	-	.002 - .0058	.001 - .002	0.122
ARSENIC	mg/L	UNF	6/7	0/7	0.003	.0028 - .0056	.001 - .001	0.0194
BARIUM	mg/L	FIL	9/9	0/9	0.078	.0481 - .159		0.451
BARIUM	mg/L	UNF	7/7	7/7	0.21	.092 - .337		0.0454
BERYLLIUM	mg/L	FIL	0/9	0/9	-		.001 - .005	0.0018
BERYLLIUM	mg/L	UNF	2/7	2/7	-	.0014 - .0018	.001 - .005	ND
CADMIUM	mg/L	FIL	0/9	0/9	-		.003 - .005	0.006
CADMIUM	mg/L	UNF	0/7	0/7	-		.003 - .005	ND
CALCIUM	mg/L	FIL	9/9	2/9	111	81.7 - 195		131
CALCIUM	mg/L	UNF	7/7	5/7	217	120 - 422		172
CHROMIUM	mg/L	FIL	2/9	0/9	0.018	.0048 - .0077	.004 - .01	0.034
CHROMIUM	mg/L	UNF	4/7	4/7	-	.0046 - .0541	.006 - .0366	0.0046

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6161

TABLE E.1-3

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA II

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
COBALT	mg/L	FIL	0/9	0/9	-		.006 - .017	ND
COBALT	mg/L	UNF	2/7	2/7	-	.0166 - .0402	.006 - .0261	ND
COPPER	mg/L	FIL	1/9	0/9	-	.0072 - .0072	.004 - .01	0.019
COPPER	mg/L	UNF	4/7	4/7	0.032	.0327 - .0654	.004 - .0093	0.0294
CYANIDE	mg/L	FIL	0/7	0/7	-		.005 - .01	ND
CYANIDE	mg/L	UNF	0/9	0/9	-		.002 - .01	ND
IRON	mg/L	FIL	3/9	0/9	-	.0508 - 6.92	.0194 - .0828	3058
IRON	mg/L	UNF	7/7	5/7	27.4	.885 - 70.8		6.35
LEAD	mg/L	FIL	2/9	0/9	-	.0011 - .0022	.001 - .0025	0.0087
LEAD	mg/L	UNF	5/7	5/7	0.0097	.0074 - .242	.001 - .001	0.0016
MAGNESIUM	mg/L	FIL	9/9	5/9	60.2	27.1 - 75.4		47.8
MAGNESIUM	mg/L	UNF	7/7	6/7	73.6	43.2 - 157		50.7
MANGANESE	mg/L	FIL	7/9	4/9	0.172	.0924 - .8	.001 - .001	0.18
MANGANESE	mg/L	UNF	7/7	6/7	0.815	.0215 - 3.26		0.205
MERCURY	mg/L	FIL	0/9	0/9	-		.0001 - .0002	ND
MERCURY	mg/L	UNF	0/7	0/7	-		.0001 - .0002	ND
MOLYBDENUM	mg/L	FIL	2/8	0/8	-	.0114 - .0118	.01 - .02	0.017
MOLYBDENUM	mg/L	UNF	0/4	0/4	-		.01 - .017	ND
NICKEL	mg/L	FIL	0/9	0/9	-		.018 - .02	0.022
NICKEL	mg/L	UNF	3/7	3/7	-	.0449 - .0749	.018 - .0899	0.0072
POTASSIUM	mg/L	FIL	9/9	0/9	1.89	.38 - 3.01		29.3
POTASSIUM	mg/L	UNF	7/7	0/7	4.87	1.27 - 15.9		17.2
SELENIUM	mg/L	FIL	0/9	0/9	-		.002 - .005	ND
SELENIUM	mg/L	UNF	0/7	0/7	-		.002 - .02	ND
SILICON	mg/L	FIL	5/5	3/5	8.28	5.45 - 9.66		7.43
SILICON	mg/L	UNF	3/3	2/3	12.1	9.99 - 18.5		10.7
SILVER	mg/L	FIL	0/9	0/9	-		.001 - .01	0.04
SILVER	mg/L	UNF	0/7	0/7	-		.001 - .003	0.0031
SODIUM	mg/L	FIL	9/9	4/9	33.5	9.16 - 87.5		38.3
SODIUM	mg/L	UNF	7/7	3/7	39.7	9.71 - 86.1		50
THALLIUM	mg/L	FIL	0/9	0/9	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/7	0/7	-		.001 - .001	ND
VANADIUM	mg/L	FIL	3/9	2/9	-	.0073 - .0271	.004 - .024	0.0195
VANADIUM	mg/L	UNF	6/7	6/7	0.037	.0297 - .0669	.004 - .004	0.0051
ZINC	mg/L	FIL	5/9	0/9	0.007	.0072 - .03	.006 - .0095	0.0443
ZINC	mg/L	UNF	6/7	0/7	0.08	.022 - .165	.006 - .006	0.352
1,1,1-TRICHLOROETHANE		UNF	1/9	1/9	-	3 - 3	5 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/9	0/9	-		5 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/9	0/9	-		5 - 10	NA
1,1-DICHLOROETHANE		UNF	1/9	1/9	-	3 - 3	5 - 10	NA
1,1-DICHLOROETHENE		UNF	0/9	0/9	-		5 - 10	NA
1,2-DICHLOROETHANE		UNF	0/9	0/9	-		5 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	5/9	5/9	5	2 - 89	5 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/9	0/9	-		5 - 10	NA
2-BUTANONE		UNF	0/9	0/9	-		10 - 10	NA
2-HEXANONE		UNF	0/9	0/9	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/9	0/9	-		10 - 10	NA
ACETONE		UNF	0/9	0/9	-		10 - 10	NA
BENZENE		UNF	0/9	0/9	-		5 - 10	NA
BROMODICHLOROMETHANE		UNF	0/9	0/9	-		5 - 10	NA
BROMOFORM		UNF	0/9	0/9	-		5 - 10	NA
BROMOMETHANE		UNF	0/9	0/9	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/9	0/9	-		5 - 10	NA

000097

TABLE E.1-3
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA II

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBON TETRACHLORIDE		UNF	0/9	0/9	-		5 - 10	NA
CHLOROBENZENE		UNF	0/9	0/9	-		5 - 10	NA
CHLOROETHANE		UNF	0/9	0/9	-		10 - 10	NA
CHLOROFORM		UNF	0/9	0/9	-		5 - 10	NA
CHLOROMETHANE		UNF	0/9	0/9	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/9	0/9	-		5 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/9	0/9	-		5 - 10	NA
ETHYLBENZENE		UNF	0/9	0/9	-		5 - 10	NA
METHYLENE CHLORIDE		UNF	0/9	0/9	-		10 - 29	NA
STYRENE		UNF	0/9	0/9	-		5 - 10	NA
TETRACHLOROETHENE		UNF	3/9	3/9	-	2 - 39	5 - 10	NA
TOLUENE		UNF	0/9	0/9	-		5 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/9	0/9	-		5 - 10	NA
TRICHLOROETHENE		UNF	3/9	3/9	-	6 - 13	5 - 10	NA
VINYL ACETATE		UNF	0/9	0/9	-		10 - 10	NA
VINYL CHLORIDE		UNF	0/9	0/9	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/9	0/9	-		5 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
2,4,6-TRICHLOROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2,4-DINITROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
2,4-DINITROTOLUENE		UNF	0/9	0/9	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/9	0/9	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/9	0/9	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/9	0/9	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2-NITROANILINE		UNF	0/9	0/9	-		25 - 50	NA
2-NITROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/9	0/9	-		10 - 20	NA
3-NITROANILINE		UNF	0/9	0/9	-		25 - 50	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/9	0/9	-		25 - 50	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/9	0/9	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/9	0/9	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
4-NITROANILINE		UNF	0/9	0/9	-		25 - 50	NA
4-NITROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
ACENAPHTHENE		UNF	0/9	0/9	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/9	0/9	-		10 - 10	NA
ANTHRACENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/9	0/9	-		10 - 10	NA
BENZOIC ACID		UNF	0/9	0/9	-		25 - 50	NA
BENZYL ALCOHOL		UNF	0/9	0/9	-		10 - 10	NA

000098
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TABLE E.1-3

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA II

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BIS(2-CHLOROETHOXY)METHANE		UNF	0/9	0/9	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/9	0/9	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/9	0/9	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
CHRYSENE		UNF	0/9	0/9	-		10 - 10	NA
CUMENE		UNF	0/2	0/2	-		5 - 5	NA
DI-N-BUTYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/9	0/9	-		10 - 10	NA
DIBENZOFURAN		UNF	0/9	0/9	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	1/9	1/9	-	7 - 7	10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
FLUORANTHENE		UNF	0/9	0/9	-		10 - 10	NA
FLUORENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/9	0/9	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/9	0/9	-		10 - 10	NA
ISOPHORONE		UNF	0/9	0/9	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/9	0/9	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/9	0/9	-		10 - 10	NA
NAPHTHALENE		UNF	0/9	0/9	-		10 - 10	NA
NITROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/9	0/9	-		10 - 10	NA
PENTACHLOROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
PHENANTHRENE		UNF	0/9	0/9	-		10 - 10	NA
PHENOL		UNF	1/9	1/9	-	1 - 1	10 - 10	NA
PYRENE		UNF	0/9	0/9	-		10 - 10	NA
TRIBUTYL PHOSPHATE		UNF	0/2	0/2	-		10 - 10	NA
4,4'-DDD		UNF	0/8	0/8	-		.1 - .2	NA
4,4'-DDE		UNF	0/8	0/8	-		.1 - .2	NA
4,4'-DDT		UNF	0/8	0/8	-		.1 - .2	NA
ALDRIN		UNF	0/8	0/8	-		.05 - .1	NA
ALPHA-BHC		UNF	0/8	0/8	-		.05 - .1	NA
ALPHA-CHLORDANE		UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1016		UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1221		UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1232		UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1242		UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1248		UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1254		UNF	0/8	0/8	-		1 - 2	NA
AROCLOR-1260		UNF	0/8	0/8	-		1 - 2	NA
BETA-BHC		UNF	0/8	0/8	-		.05 - .1	NA
DELTA-BHC		UNF	0/8	0/8	-		.05 - .1	NA
DIELDRIN		UNF	0/8	0/8	-		.1 - .2	NA
ENDOSULFAN II		UNF	0/8	0/8	-		.1 - .2	NA
ENDOSULFAN SULFATE		UNF	0/8	0/8	-		.1 - .2	NA
ENDOSULFAN-I		UNF	0/8	0/8	-		.05 - .1	NA
ENDRIN		UNF	0/8	0/8	-		.1 - .2	NA
ENDRIN KETONE		UNF	0/8	0/8	-		.1 - .2	NA
GAMMA-BHC (LINDANE)		UNF	0/8	0/8	-		.05 - .1	NA

000099

TABLE E.1-3
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA II

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
GAMMA-CHLORDANE		UNF	0/8	0/8	-		.5 - 1	NA
HEPTACHLOR		UNF	0/8	0/8	-		.05 - .1	NA
HEPTACHLOR EPOXIDE		UNF	0/8	0/8	-		.05 - .1	NA
METHOXYCHLOR		UNF	0/8	0/8	-		.5 - 1	NA
TOXAPHENE		UNF	0/8	0/8	-		1 - 2	NA
AZINPHOSMETHYL		UNF	0/2	0/2	-		1 - 1	NA
DEMETON		UNF	0/2	0/2	-		2 - 2	NA
DIAZINON		UNF	0/2	0/2	-		1 - 1	NA
DISULFOTON		UNF	0/2	0/2	-		.5 - .5	NA
ETHION		UNF	0/2	0/2	-		.5 - .5	NA
MALATHION		UNF	0/2	0/2	-		1 - 1	NA
METHYL PARATHION		UNF	0/2	0/2	-		1 - 1	NA
PARATHION		UNF	0/2	0/2	-		1 - 1	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		.65 - .65	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.22 - .22	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.23 - .23	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		.54 - .54	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.18 - .18	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		.46 - .46	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.17 - .17	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		.63 - .63	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.23 - .23	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		.78 - .78	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.28 - .28	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.33 - .33	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.31 - .31	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		1.7 - 1.7	NA
2,3,7,8-TETRACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.7 - .7	NA
HEPTACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		.65 - .65	NA
HEPTACHLORODIBENZOFURANS		UNF	0/1	0/1	-		.78 - .78	NA
HEXACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		.73 - .73	NA
HEXACHLORODIBENZOFURANS		UNF	0/1	0/1	-		.4 - .4	NA
OCTACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		1.5 - 1.5	NA
OCTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		.38 - .38	NA
PENTACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		.78 - .78	NA
PENTACHLORODIBENZOFURANS		UNF	0/1	0/1	-		.28 - .28	NA
TETRACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		.26 - .26	NA
TETRACHLORODIBENZOFURANS		UNF	0/1	0/1	-		.64 - .64	NA
ALKALINITY AS CACO3		UNF	8/8	8/8	435	.45 - 552.5		NA
AMMONIA	mg/L	UNF	4/9	0/9	-	.0481 - .366	.03 - .05	4.34
CHLORIDE	mg/L	UNF	8/8	1/8	13.55	.032 - 61		45
FLUORIDE	mg/L	UNF	8/8	0/8	0.4	.29 - .51		1.3
NITRATE	mg/L	UNF	5/8	5/8	0.65	.62 - 18.1	.02 - .1	0.29
NITRATE/NITRITE	mg/L	UNF	4/7	3/7	0.06	.06 - 22	.04 - .1	0.07
NITRITE, AS NITROGEN		UNF	1/1	1/1	-	1.6 - 1.6		NA
PHENOLS	mg/L	UNF	0/9	0/9	-		.002 - .02	0.03
PHOSPHATE		UNF	0/3	0/3	-			NA
PHOSPHORUS		UNF	6/6	6/6	1.88	.14 - 5.6		NA
SULFATE	mg/L	UNF	8/8	2/8	89.05	.17 - 150		136
SULFIDE		UNF	0/9	0/9	-		.5 - 1	NA
TOTAL KJELDAHL NITROGEN	mg/L	UNF	2/3	0/3	0.19	.192 - .456	.1 - .1	4.34
TOTAL ORGANIC CARBON	mg/L	UNF	8/9	0/9	2	1.85 - 4	2 - 2	9
TOTAL ORGANIC HALIDES	mg/L	UNF	8/9	0/9	0.04	.0195 - .0543	.005 - .005	0.126

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TABLE E.1-3
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA II

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
TOTAL ORGANIC NITROGEN	mg/L	UNF	4/5	2/5	0.19	.09 - .798	.1 - .1	0.34

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

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TABLE E.1-4
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA III

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/3	3/3	1.43	.93 - 2.43		ND
URANIUM-238	pCi/L	UNF	5/5	5/5	7.09	1.19 - 12.5		0.8
URANIUM, TOTAL	ug/L	FIL	3/3	3/3	4.33	2.7 - 6.14		1.4
URANIUM, TOTAL	ug/L	UNF	5/5	5/5	13.7	3 - 31.1		1.3
URANIUM-234	pCi/L	FIL	3/3	3/3	1.72	.7 - 2.62		0.6
URANIUM-234	pCi/L	UNF	5/5	5/5	7.46	1.16 - 11.4		0.9
THORIUM-230	pCi/L	FIL	1/3	1/3	-	2.36 - 2.36	.2 - .2	ND
THORIUM-230	pCi/L	UNF	3/5	1/5	0.3	.227 - 11.2	.2 - .2	1.3
RADIUM-226	pCi/L	FIL	0/3	0/3	-		1 - 1	0.9
RADIUM-226	pCi/L	UNF	2/5	2/5	-	1.36 - 3.18	1 - 1	0.9
URANIUM-235/236	pCi/L	FIL	0/3	0/3	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	3/5	3/5	0.303	.303 - .56	.2 - .2	ND
THORIUM-232	pCi/L	FIL	1/3	1/3	-	.216 - .216	.2 - .2	ND
THORIUM-232	pCi/L	UNF	1/5	1/5	-	8.56 - 8.56	.2 - .2	0.34
THORIUM, TOTAL	ug/L	FIL	1/3	1/3	-	1.97 - 1.97	.64 - .66	ND
THORIUM, TOTAL	ug/L	UNF	1/5	1/5	-	78 - 78	.5 - 1.12	3.1
RADIUM-228	pCi/L	FIL	0/3	0/3	-		3 - 3	2.2
RADIUM-228	pCi/L	UNF	1/5	1/5	-	5.93 - 5.93	3 - 5.45	3
THORIUM-228	pCi/L	FIL	0/3	0/3	-		.2 - .344	0.1
THORIUM-228	pCi/L	UNF	1/5	1/5	-	9.87 - 9.87	.2 - .2	1.5
NEPTUNIUM-237	pCi/L	FIL	1/3	1/3	-	0 - 0	.5 - .5	not tested
NEPTUNIUM-237	pCi/L	UNF	0/5	0/5	-		.5 - .5	0.25
PLUTONIUM-239/240	pCi/L	FIL	0/3	0/3	-		.5 - .5	ND
PLUTONIUM-239/240	pCi/L	UNF	0/5	0/5	-		.5 - .5	ND
PLUTONIUM-238	pCi/L	FIL	0/3	0/3	-		.5 - .5	not tested
PLUTONIUM-238	pCi/L	UNF	0/5	0/5	-		.5 - .5	0.075
STRONTIUM-90	pCi/L	FIL	1/3	1/3	-	1.33 - 1.33	1 - 1	not tested
STRONTIUM-90	pCi/L	UNF	1/5	0/5	-	1.19 - 1.19	1 - 1.02	2
TECHNETIUM-99	pCi/L	FIL	0/3	0/3	-		15 - 15	30
TECHNETIUM-99	pCi/L	UNF	0/5	0/5	-		15 - 15	30
RUTHENIUM-106	pCi/L	FIL	0/3	0/3	-		150 - 150	not tested
RUTHENIUM-106	pCi/L	UNF	0/5	0/5	-		150 - 154	ND
CESIUM-137	pCi/L	FIL	0/3	0/3	-		13.2 - 18	not tested
CESIUM-137	pCi/L	UNF	0/5	0/5	-		14 - 18	ND
GROSS ALPHA		FIL	1/3	1/3	12.1	12.1 - 12.1	4.02 - 8.19	NA
GROSS ALPHA		UNF	1/5	1/5	13.3	198 - 198	4.02 - 26.6	NA
GROSS BETA		FIL	2/3	2/3	2.425	6.64 - 7.04	4.85 - 4.85	NA
GROSS BETA		UNF	4/5	4/5	67.5	7.35 - 426	11 - 11	NA
ALUMINUM	mg/L	FIL	3/5	2/5	0.098	.0556 - .435	.0827 - .196	0.123
ALUMINUM	mg/L	UNF	3/3	2/3	130	.543 - 184		2.29
ANTIMONY	mg/L	FIL	2/5	0/5	-	.0061 - .0074	.001 - .014	0.0272
ANTIMONY	mg/L	UNF	0/3	0/3	-		.005 - .014	ND
ARSENIC	mg/L	FIL	1/5	0/5	-	.0041 - .0041	.001 - .002	0.122
ARSENIC	mg/L	UNF	3/3	0/3	0.007	.0051 - .0076		0.0194
BARIUM	mg/L	FIL	5/5	0/5	0.077	.0459 - .201		0.454
BARIUM	mg/L	UNF	3/3	3/3	1.05	.0721 - 1.14		0.0454
BERYLLIUM	mg/L	FIL	0/5	0/5	-		.0012 - .0036	0.0018
BERYLLIUM	mg/L	UNF	2/3	2/3	0.006	.0061 - .0096	.0017 - .0017	ND
CADMIUM	mg/L	FIL	0/5	0/5	-		.002 - .005	0.006
CADMIUM	mg/L	UNF	1/3	1/3	-	.0056 - .0056	.005 - .005	ND
CALCIUM	mg/L	FIL	5/5	1/5	109	61.8 - 153		131
CALCIUM	mg/L	UNF	3/3	2/3	1190	61.1 - 1360		172
CHROMIUM	mg/L	FIL	0/5	0/5	-		.004 - .01	0.034

6161
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TABLE E.1-4

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA III

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHROMIUM	mg/L	UNF	2/3	2/3	0.167	.167 - .196	.014 - .014	0.0046
COBALT	mg/L	FIL	0/5	0/5	-		.003 - .017	ND
COBALT	mg/L	UNF	2/3	2/3	0.069	.069 - .116	.017 - .017	ND
COPPER	mg/L	FIL	0/5	0/5	-		.0048 - .0127	0.019
COPPER	mg/L	UNF	2/3	2/3	0.246	.246 - .332	.0207 - .0207	0.0294
CYANIDE	mg/L	UNF	0/5	0/5	-		.001 - .005	ND
IRON	mg/L	FIL	2/5	0/5	-	.0246 - .334	.022 - .0514	3.58
IRON	mg/L	UNF	3/3	2/3	265	.958 - 370		6.35
LEAD	mg/L	FIL	1/5	1/5	-	.0097 - .0097	.001 - .002	0.0087
LEAD	mg/L	UNF	3/3	3/3	0.084	.0021 - .0992		0.0016
MAGNESIUM	mg/L	FIL	5/5	3/5	50.6	18.7 - 139		47.8
MAGNESIUM	mg/L	UNF	3/3	2/3	384	18.7 - 413		50.7
MANGANESE	mg/L	FIL	4/5	2/5	0.0158	.0041 - .378	.002 - .002	0.18
MANGANESE	mg/L	UNF	3/3	2/3	4.92	.0329 - 6.49		0.205
MERCURY	mg/L	FIL	0/5	0/5	-		.0002 - .0002	ND
MERCURY	mg/L	UNF	2/3	2/3	0.0002	.0002 - .0004	.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	2/5	0/5	0.005	.0045 - .0055	.01 - .02	0.017
MOLYBDENUM	mg/L	UNF	2/3	2/3	0.0495	.0495 - .108	.0176 - .0176	ND
NICKEL	mg/L	FIL	1/5	0/5	-	.0054 - .0054	.003 - .02	0.022
NICKEL	mg/L	UNF	3/3	3/3	0.243	.0102 - .339		0.0072
POTASSIUM	mg/L	FIL	5/5	0/5	1.4	1.18 - 5.98		29.3
POTASSIUM	mg/L	UNF	3/3	2/3	21.3	6.49 - 27.4		17.2
SELENIUM	mg/L	FIL	1/5	1/5	-	.0182 - .0182	.001 - .002	ND
SELENIUM	mg/L	UNF	1/3	1/3	-	.0195 - .0195	.002 - .01	ND
SILICON	mg/L	FIL	5/5	4/5	8.2	6.22 - 10.8		7.43
SILICON	mg/L	UNF	3/3	3/3	78.6	10.8 - 83.4		10.7
SILVER	mg/L	FIL	0/5	0/5	-		.002 - .01	0.04
SILVER	mg/L	UNF	2/3	2/3	0.061	.0613 - .0889	.002 - .002	0.0031
SODIUM	mg/L	FIL	5/5	0/5	19.1	12.5 - 40.9		56.3
SODIUM	mg/L	UNF	3/3	0/3	12.8	12.8 - 19		50
THALLIUM	mg/L	FIL	0/5	0/5	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/3	0/3	-		.001 - .002	ND
VANADIUM	mg/L	FIL	1/5	1/5	-	.0318 - .0318	.0099 - .0165	0.0195
VANADIUM	mg/L	UNF	3/3	3/3	0.319	.0356 - .376		0.0051
ZINC	mg/L	FIL	3/5	0/5	0.004	.0045 - .017	.005 - .005	0.0443
ZINC	mg/L	UNF	3/3	2/3	0.645	.018 - .94		0.352
1,1,1-TRICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1-DICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1-DICHLOROETHENE		UNF	0/5	0/5	-		10 - 10	NA
1,2-DICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/5	0/5	-		10 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/5	0/5	-		10 - 10	NA
2-BUTANONE		UNF	1/5	1/5	-	1 - 1	10 - 10	NA
2-HEXANONE		UNF	0/5	0/5	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/5	0/5	-		10 - 10	NA
ACETONE		UNF	1/5	1/5	-	6 - 6	3 - 10	NA
BENZENE		UNF	0/5	0/5	-		10 - 10	NA
BROMODICHLOROMETHANE		UNF	0/5	0/5	-		10 - 10	NA
BROMOFORM		UNF	0/5	0/5	-		10 - 10	NA
BROMOMETHANE		UNF	0/5	0/5	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/5	0/5	-		10 - 10	NA

000103

TABLE E.1-4
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA III

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBON TETRACHLORIDE		UNF	0/5	0/5	-		10 - 10	NA
CHLOROBENZENE		UNF	0/5	0/5	-		10 - 10	NA
CHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
CHLOROFORM		UNF	0/5	0/5	-		10 - 10	NA
CHLOROMETHANE		UNF	0/5	0/5	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/5	0/5	-		10 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/5	0/5	-		10 - 10	NA
ETHYLBENZENE		UNF	0/5	0/5	-		10 - 10	NA
METHYLENE CHLORIDE		UNF	0/5	0/5	-		10 - 10	NA
STYRENE		UNF	0/5	0/5	-		10 - 10	NA
TETRACHLOROETHENE		UNF	0/5	0/5	-		10 - 10	NA
TOLUENE		UNF	0/5	0/5	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/5	0/5	-		10 - 10	NA
TRICHLOROETHENE		UNF	0/5	0/5	-		1 - 1	NA
TRICHLOROFLUOROMETHANE		UNF	0/3	0/3	-		10 - 10	NA
VINYL ACETATE		UNF	0/3	0/3	-		10 - 10	NA
VINYL CHLORIDE		UNF	0/5	0/5	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/5	0/5	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/4	0/4	-		1 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/5	0/5	-		1 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/5	0/5	-		25 - 25	NA
2,4,5-TRICHLOROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
2,4,6-TRICHLOROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/4	0/4	-		25 - 25	NA
2,4-DINITROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
2,4-DINITROTOLUENE		UNF	0/4	0/4	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/4	0/4	-		10 - 10	NA
2-BENZYL-4-CHLOROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/3	0/3	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/4	0/4	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/4	0/4	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/4	0/4	-		25 - 25	NA
2-NITROANILINE		UNF	0/4	0/4	-		10 - 10	NA
2-NITROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/4	0/4	-		25 - 25	NA
3-NITROANILINE		UNF	0/4	0/4	-		25 - 25	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/4	0/4	-		10 - 10	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/4	0/4	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/4	0/4	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/4	0/4	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/4	0/4	-		25 - 25	NA
4-NITROANILINE		UNF	0/4	0/4	-		25 - 25	NA
4-NITROPHENOL		UNF	0/4	0/4	-		10 - 10	NA
ACENAPHTHENE		UNF	0/4	0/4	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/4	0/4	-		10 - 10	NA
ANTHRACENE		UNF	0/4	0/4	-		10 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/4	0/4	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/4	0/4	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/4	0/4	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/4	0/4	-		10 - 10	NA

000104
1919

TABLE E.1-4

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA III

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(K)FLUORANTHENE		UNF	0/4	0/4	-		10 - 10	NA
BENZOIC ACID		UNF	0/4	0/4	-		50 - 50	NA
BENZYL ALCOHOL		UNF	0/4	0/4	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/4	0/4	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/4	0/4	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/4	0/4	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	0/4	0/4	-		10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/4	0/4	-		10 - 10	NA
CARBAZOLE		UNF	0/4	0/4	-		10 - 10	NA
CHRYSENE		UNF	0/4	0/4	-		10 - 10	NA
DI-N-BUTYL PHTHALATE		UNF	0/4	0/4	-		10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/4	0/4	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/4	0/4	-		10 - 10	NA
DIBENZOFURAN		UNF	0/4	0/4	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	1/4	1/4	-	1 - 1	10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/4	0/4	-		10 - 10	NA
FLUORANTHENE		UNF	0/4	0/4	-		10 - 10	NA
FLUORENE		UNF	0/4	0/4	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/4	0/4	-		10 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/4	0/4	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/4	0/4	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/4	0/4	-		10 - 10	NA
ISOPHORONE		UNF	0/4	0/4	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/4	0/4	-		10 - 10	NA
N-NITROSODIMETHYLAMINE		UNF	0/2	0/2	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/4	0/4	-		10 - 10	NA
NAPHTHALENE		UNF	0/4	0/4	-		10 - 10	NA
NITROBENZENE		UNF	0/4	0/4	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/4	0/4	-		10 - 10	NA
PENTACHLOROPHENOL		UNF	0/4	0/4	-		25 - 25	NA
PHENANTHRENE		UNF	0/4	0/4	-		10 - 10	NA
PHENOL		UNF	0/4	0/4	-		10 - 10	NA
PYRENE		UNF	0/4	0/4	-		10 - 10	NA
TRIBUTYL PHOSPHATE		UNF	1/2	1/2	-	1 - 1	10 - 10	NA
4,4'-DDD		UNF	0/4	0/4	-		.1 - .1	NA
4,4'-DDE		UNF	0/4	0/4	-		.1 - .1	NA
4,4'-DDT		UNF	0/4	0/4	-		.1 - .1	NA
ALDRIN		UNF	0/4	0/4	-		.05 - .05	NA
ALPHA-BHC		UNF	0/4	0/4	-		.05 - .05	NA
ALPHA-CHLORDANE		UNF	0/4	0/4	-		.05 - .05	NA
AROCLOR-1016		UNF	0/4	0/4	-		1 - 1	NA
AROCLOR-1221		UNF	0/4	0/4	-		2 - 2	NA
AROCLOR-1232		UNF	0/4	0/4	-		1 - 1	NA
AROCLOR-1242		UNF	0/4	0/4	-		1 - 1	NA
AROCLOR-1248		UNF	0/4	0/4	-		1 - 1	NA
AROCLOR-1254		UNF	0/4	0/4	-		1 - 1	NA
AROCLOR-1260		UNF	0/4	0/4	-		1 - 1	NA
BETA-BHC		UNF	0/4	0/4	-		.05 - .05	NA
DELTA-BHC		UNF	0/4	0/4	-		.05 - .05	NA
DIELDRIN		UNF	0/4	0/4	-		.1 - .1	NA
ENDOSULFAN II		UNF	0/4	0/4	-		.1 - .1	NA
ENDOSULFAN SULFATE		UNF	0/4	0/4	-		.1 - .1	NA

000105

TABLE E.1-4
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA III

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ENDOSULFAN-I		UNF	0/4	0/4	-		.05 - .05	NA
ENDRIN		UNF	0/4	0/4	-		.1 - .1	NA
ENDRIN ALDEHYDE		UNF	0/4	0/4	-		.1 - .1	NA
ENDRIN KETONE		UNF	0/4	0/4	-		.1 - .1	NA
GAMMA-BHC (LINDANE)		UNF	0/4	0/4	-		.05 - .05	NA
GAMMA-CHLORDANE		UNF	0/4	0/4	-		.05 - .05	NA
HEPTACHLOR		UNF	0/4	0/4	-		.05 - .05	NA
HEPTACHLOR EPOXIDE		UNF	0/4	0/4	-		.05 - .05	NA
METHOXYCHLOR		UNF	0/4	0/4	-		.5 - .5	NA
TOXAPHENE		UNF	0/4	0/4	-		5 - 5	NA
ALKALINITY AS CACO3		UNF	6/6	6/6	370	140 - 790		NA
AMMONIA	mg/L	UNF	2/5	0/5	-	.11 - .26	.03 - .1	4.34
BICARBONATE ALKALINITY		UNF	1/1	1/1	-	180 - 180		NA
CARBONATE ALKALINITY		UNF	0/1	0/1	-		1 - 1	NA
CHLORIDE	mg/L	UNF	6/6	0/6	7.045	1.19 - 33		45
FLUORIDE	mg/L	UNF	5/5	0/5	0.43	.19 - .64		1.3
NITRATE	mg/L	UNF	2/4	1/4	0.18	.26 - .52		0.29
NITRATE, AS NITROGEN		UNF	3/3	3/3	0.08	.04 - .1		NA
NITRATE/NITRITE	mg/L	UNF	3/3	1/3	0.03	.02 - .591		0.07
PH		UNF	3/3	3/3	6.9	6.68 - 7.13		NA
PHENOLS	mg/L	UNF	0/5	0/5	-		.005 - .01	0.03
PHOSPHATE		UNF	0/1	0/1	-			NA
PHOSPHORUS		UNF	5/5	5/5	0.64	.08 - 12.11		NA
SPECIFIC CONDUCTIVITY		UNF	3/3	3/3	819	536 - 1540		NA
SULFATE	mg/L	UNF	6/6	1/6	75.5	47.5 - 166.9		136
SULFIDE		UNF	0/4	0/4	-		.5 - .5	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	3/3	2/3	650	345 - 1230		452
TOTAL KJELDAHL NITROGEN	mg/L	UNF	4/5	1/5	0.41	.23 - 4.61	.1 - .1	4.34
TOTAL ORGANIC CARBON	mg/L	UNF	5/5	0/5	1.79	1.19 - 3		9
TOTAL ORGANIC HALIDES	mg/L	UNF	2/4	1/4	2.5	.0205 - 62.3	.01 - 10	0.126
TOTAL ORGANIC HALOGENS		UNF	1/3	1/3	-	.119 - .119	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	4/5	3/5	0.41	.23 - 4.5	.1 - .1	0.34
TRANS-1,2-DICHLOROETHENE		UNF	0/3	0/3	-		1 - 1	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

6161
000106

TABLE E.1-5

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA IV

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	2/3	2/3	8.1	1 - 87.9		ND
URANIUM-238	pCi/L	UNF	10/12	10/12	2.2	1.08 - 434	1 - 1	0.8
URANIUM, TOTAL	ug/L	FIL	4/4	4/4	156	2.9 - 810		1.4
URANIUM, TOTAL	ug/L	UNF	12/12	12/12	6.6	1.51 - 1250		1.3
URANIUM-234	pCi/L	FIL	2/3	2/3	5.6	1.3 - 73.4		0.6
URANIUM-234	pCi/L	UNF	5/7	5/7	3	1.17 - 427		0.9
THORIUM-230	pCi/L	FIL	1/3	1/3	-	.6 - .6	.2 - 1	ND
THORIUM-230	pCi/L	UNF	2/8	0/8	-	.37 - .4	.2 - 1	1.3
RADIUM-226	pCi/L	FIL	0/3	0/3	-		1 - 1	0.9
RADIUM-226	pCi/L	UNF	1/13	1/13	-	35.8 - 35.8	1 - 25	0.9
LEAD-210		FIL	0/1	0/1	-		3 - 3	NA
LEAD-210		UNF	0/3	0/3	-		3 - 3	NA
POLONIUM-210		UNF	0/2	0/2	-		1.2 - 1.7	NA
URANIUM-235/236	pCi/L	FIL	1/3	1/3	-	3.4 - 3.4	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	2/7	2/7	-	3.5 - 21	.2 - 1	ND
THORIUM-232	pCi/L	FIL	0/3	0/3	-		.2 - 1	ND
THORIUM-232	pCi/L	UNF	0/8	0/8	-		.2 - 1	0.34
THORIUM, TOTAL	ug/L	FIL	0/1	0/1	-		4 - 4	ND
THORIUM, TOTAL	ug/L	UNF	0/8	0/8	-		.5 - 9.1	3.1
RADIUM-228	pCi/L	FIL	0/3	0/3	-		3 - 3	2.2
RADIUM-228	pCi/L	UNF	1/8	1/8	-	23.7 - 23.7	3 - 44	3
THORIUM-228	pCi/L	FIL	0/3	0/3	-		.2 - 1	0.1
THORIUM-228	pCi/L	UNF	2/8	2/8	-	1.54 - 1.96	.2 - .2	1.5
NEPTUNIUM-237	pCi/L	FIL	0/1	0/1	-		1 - 1	not tested
NEPTUNIUM-237	pCi/L	UNF	0/6	0/6	-		.5 - 1	0.25
PLUTONIUM-239/240	pCi/L	FIL	0/1	0/1	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/6	0/6	-		.5 - 1	ND
PLUTONIUM-238	pCi/L	FIL	0/1	0/1	-		1 - 1	not tested
PLUTONIUM-238	pCi/L	UNF	0/6	0/6	-		.5 - 1	0.075
STRONTIUM-90	pCi/L	FIL	0/1	0/1	-		5 - 5	not tested
STRONTIUM-90	pCi/L	UNF	0/6	0/6	-		1 - 5	2
TECHNETIUM-99	pCi/L	FIL	0/3	0/3	-		15 - 30	30
TECHNETIUM-99	pCi/L	UNF	1/6	0/6	-	20.1 - 20.1	15 - 30	30
RUTHENIUM-106	pCi/L	FIL	0/1	0/1	-			not tested
RUTHENIUM-106	pCi/L	UNF	0/6	0/6	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/1	0/1	-			not tested
CESIUM-137	pCi/L	UNF	0/6	0/6	-		18.5 - 20	ND
GROSS ALPHA		UNF	3/3	3/3	104	54.4 - 546		NA
GROSS BETA		UNF	3/3	3/3	99.4	45.4 - 135		NA
ACTINIUM-227		UNF	0/3	0/3	-		1 - 62	NA
PROTACTINIUM-231		UNF	0/3	0/3	-		290 - 348	NA
RADIUM-224		UNF	0/3	0/3	-		20 - 21	NA
ALUMINUM	mg/L	FIL	4/6	2/6	0.083	.0753 - .263	.0592 - .0975	0.123
ALUMINUM	mg/L	UNF	8/9	3/9	0.399	.141 - 13.8	.0935 - .0935	2.29
ANTIMONY	mg/L	FIL	2/6	2/6	-	.0674 - .0987	.014 - .078	0.0272
ANTIMONY	mg/L	UNF	3/9	3/9	-	.0827 - .0947	.005 - .03	ND
ARSENIC	mg/L	FIL	1/7	0/7	-	.0027 - .0027	.002 - .002	0.122
ARSENIC	mg/L	UNF	5/9	0/9	0.0029	.0029 - .0064	.001 - .002	0.0194
BARIUM	mg/L	FIL	7/7	0/7	0.063	.0175 - .284		0.451
BARIUM	mg/L	UNF	9/9	6/9	0.054	.0147 - .702		0.0454
BERYLLIUM	mg/L	FIL	0/6	0/6	-		.002 - .005	0.0018
BERYLLIUM	mg/L	UNF	0/9	0/9	-		.001 - .005	ND
CADMIUM	mg/L	FIL	5/7	4/7	0.008	.0052 - .0234	.005 - .005	0.006

000107

TABLE E.1-5
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA IV

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CADMIUM	mg/L	UNF	5/9	5/9	0.005	.005 - .0251	.003 - .005	ND
CALCIUM	mg/L	FIL	7/7	5/7	134	127 - 500		131
CALCIUM	mg/L	UNF	9/9	5/9	176	96.2 - 516		172
CHROMIUM	mg/L	FIL	5/7	3/7	0.018	.0121 - .0455	.006 - .006	0.034
CHROMIUM	mg/L	UNF	6/9	6/9	0.019	.01 - .491	.006 - .01	0.0046
COBALT	mg/L	FIL	3/6	3/6	0.01	.0125 - .0199	.01 - .017	ND
COBALT	mg/L	UNF	3/9	3/9	-	.018 - .0264	.006 - .017	ND
COPPER	mg/L	FIL	4/7	3/7	0.0131	.0131 - .03	.009 - .01	0.019
COPPER	mg/L	UNF	5/9	3/9	0.0099	.0099 - .0917	.009 - .01	0.0294
CYANIDE	mg/L	FIL	0/2	0/2	-		.005 - .005	ND
CYANIDE	mg/L	UNF	3/10	3/10	-	.0067 - .054	.00002 - .005	ND
IRON	mg/L	FIL	5/7	0/7	1.7	.085 - 20.1	.022 - .022	3058
IRON	mg/L	UNF	8/9	4/9	5.6	.859 - 40.5	.02 - .02	6.35
LEAD	mg/L	FIL	1/7	0/7	-	.0022 - .0022	.001 - .002	0.0087
LEAD	mg/L	UNF	4/9	4/9	-	.0068 - .0146	.001 - .002	0.0016
MAGNESIUM	mg/L	FIL	7/7	6/7	56.7	44.2 - 154		47.8
MAGNESIUM	mg/L	UNF	9/9	6/9	62.7	14.6 - 158		50.7
MANGANESE	mg/L	FIL	6/7	4/7	0.23	.0119 - .62	.004 - .004	0.18
MANGANESE	mg/L	UNF	9/9	6/9	0.292	.0141 - .839		0.205
MERCURY	mg/L	FIL	0/7	0/7	-		.0001 - .0002	ND
MERCURY	mg/L	UNF	0/9	0/9	-		.0001 - .0002	ND
MOLYBDENUM	mg/L	FIL	4/7	4/7	0.183	.0183 - .266	.017 - .02	0.017
MOLYBDENUM	mg/L	UNF	4/8	4/8	0.015	.0209 - .259	.017 - .02	ND
NICKEL	mg/L	FIL	4/7	4/7	0.028	.024 - .0632	.018 - .0936	0.022
NICKEL	mg/L	UNF	5/9	5/9	0.029	.029 - .136	.018 - .02	0.0072
POTASSIUM	mg/L	FIL	7/7	0/7	1.53	.99 - 3.49		29.3
POTASSIUM	mg/L	UNF	9/9	0/9	2.36	1.49 - 3.83		17.2
SELENIUM	mg/L	FIL	3/7	3/7	-	.0043 - .0494	.002 - .002	ND
SELENIUM	mg/L	UNF	4/9	4/9	0.001	.0032 - .0566	.002 - .002	ND
SILICON	mg/L	FIL	6/6	2/6	7.21	4.6 - 8.73		7.43
SILICON	mg/L	UNF	8/8	3/8	10.07	7.26 - 29.9		10.7
SILVER	mg/L	FIL	4/7	0/7	0.018	.0182 - .0379	.0005 - .002	0.04
SILVER	mg/L	UNF	5/9	5/9	0.005	.0034 - .0473	.002 - .01	0.0031
SODIUM	mg/L	FIL	7/7	5/7	114	18 - 1070		38.3
SODIUM	mg/L	UNF	9/9	5/9	68	16 - 1040		50
THALLIUM	mg/L	FIL	0/6	0/6	-		.001 - .01	ND
THALLIUM	mg/L	UNF	0/9	0/9	-		.001 - .01	ND
VANADIUM	mg/L	FIL	4/6	3/6	0.016	.0108 - .0268	.024 - .024	0.0195
VANADIUM	mg/L	UNF	5/9	5/9	0.012	.0052 - .0571	.01 - .024	0.0051
ZINC	mg/L	FIL	4/6	3/6	0.275	.014 - 1.78	.006 - .0117	0.0443
ZINC	mg/L	UNF	7/9	3/9	0.018	.0101 - 1.59	.0091 - .0188	0.352
1,1,1-TRICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	2/8	2/8	-	2 - 5	1 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	1/8	1/8	-	2 - 2	1 - 10	NA
1,1-DICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,1-DICHLOROETHENE		UNF	0/8	0/8	-		1 - 10	NA
1,2-DICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/8	0/8	-		1 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/8	0/8	-		1 - 10	NA
2-BUTANONE		UNF	0/8	0/8	-		2 - 10	NA
2-HEXANONE		UNF	2/8	2/8	-	1 - 6	2 - 10	NA
4-METHYL-2-PENTANONE		UNF	1/8	1/8	-	7 - 7	2 - 10	NA
ACETONE		UNF	2/8	2/8	-	4 - 41	2 - 13	NA

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SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA IV

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZENE		UNF	0/8	0/8	-		1 - 10	NA
BROMODICHLOROMETHANE		UNF	0/8	0/8	-		1 - 10	NA
BROMOFORM		UNF	1/8	1/8	-	2 - 2	1 - 10	NA
BROMOMETHANE		UNF	0/8	0/8	-		1 - 10	NA
CARBON DISULFIDE		UNF	1/8	1/8	-	9 - 9	1 - 10	NA
CARBON TETRACHLORIDE		UNF	0/8	0/8	-		1 - 10	NA
CHLOROBENZENE		UNF	0/8	0/8	-		1 - 10	NA
CHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
CHLOROFORM		UNF	0/8	0/8	-		1 - 10	NA
CHLOROMETHANE		UNF	0/8	0/8	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/8	0/8	-		1 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/8	0/8	-		1 - 10	NA
ETHYLBENZENE		UNF	0/8	0/8	-		1 - 10	NA
METHYLENE CHLORIDE		UNF	1/8	1/8	-	2 - 2	1 - 10	NA
STYRENE		UNF	0/8	0/8	-		1 - 10	NA
TETRACHLOROETHENE		UNF	0/8	0/8	-		1 - 10	NA
TOLUENE		UNF	1/8	1/8	-	1 - 1	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/8	0/8	-		1 - 10	NA
TRICHLOROETHENE		UNF	0/8	0/8	-		1 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/3	0/3	-		1 - 1	NA
VINYL ACETATE		UNF	0/8	0/8	-		2 - 10	NA
VINYL CHLORIDE		UNF	0/8	0/8	-		1 - 10	NA
XYLENES, TOTAL		UNF	0/8	0/8	-		1 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/5	0/5	-		10 - 20	NA
1,2-DICHLOROBENZENE		UNF	0/5	0/5	-		10 - 20	NA
1,3-DICHLOROBENZENE		UNF	0/8	0/8	-		1 - 20	NA
1,4-DICHLOROBENZENE		UNF	0/8	0/8	-		1 - 20	NA
2,4,5-TRICHLOROPHENOL		UNF	0/5	0/5	-		50 - 100	NA
2,4,6-TRICHLOROPHENOL		UNF	0/5	0/5	-		10 - 20	NA
2,4-DICHLOROPHENOL		UNF	0/5	0/5	-		10 - 20	NA
2,4-DIMETHYLPHENOL		UNF	0/5	0/5	-		10 - 20	NA
2,4-DINITROPHENOL		UNF	0/5	0/5	-		50 - 100	NA
2,4-DINITROTOLUENE		UNF	0/5	0/5	-		10 - 20	NA
2,6-DINITROTOLUENE		UNF	0/5	0/5	-		10 - 20	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/3	0/3	-		10 - 60	NA
2-CHLORONAPHTHALENE		UNF	0/5	0/5	-		10 - 20	NA
2-CHLOROPHENOL		UNF	0/5	0/5	-		10 - 20	NA
2-METHYLNAPHTHALENE		UNF	0/5	0/5	-		10 - 20	NA
2-METHYLPHENOL		UNF	0/5	0/5	-		10 - 20	NA
2-NITROANILINE		UNF	0/5	0/5	-		50 - 100	NA
2-NITROPHENOL		UNF	0/5	0/5	-		10 - 20	NA
3,3'-DICHLOROBENZIDINE		UNF	0/5	0/5	-		20 - 40	NA
3-NITROANILINE		UNF	0/5	0/5	-		50 - 100	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/5	0/5	-		50 - 100	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/5	0/5	-		10 - 20	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/5	0/5	-		10 - 20	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/5	0/5	-		10 - 20	NA
4-METHYLPHENOL		UNF	0/5	0/5	-		10 - 20	NA
4-NITROANILINE		UNF	0/5	0/5	-		50 - 100	NA
4-NITROPHENOL		UNF	0/5	0/5	-		50 - 100	NA
ACENAPHTHENE		UNF	0/5	0/5	-		10 - 20	NA
ACENAPHTHYLENE		UNF	0/5	0/5	-		10 - 20	NA
ANTHRACENE		UNF	0/5	0/5	-		10 - 20	NA

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TABLE E.1-5
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA IV

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(A)ANTHRACENE		UNF	0/5	0/5	-		10 - 20	NA
BENZO(A)PYRENE		UNF	0/5	0/5	-		10 - 20	NA
BENZO(B)FLUORANTHENE		UNF	0/5	0/5	-		10 - 20	NA
BENZO(G,H,I)PERYLENE		UNF	0/5	0/5	-		10 - 20	NA
BENZO(K)FLUORANTHENE		UNF	0/5	0/5	-		10 - 20	NA
BENZOIC ACID		UNF	0/5	0/5	-		50 - 100	NA
BENZYL ALCOHOL		UNF	0/5	0/5	-		10 - 20	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/5	0/5	-		10 - 20	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/5	0/5	-		10 - 20	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/5	0/5	-		10 - 20	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	1/5	1/5	-	350 - 350	10 - 20	NA
BUTYL BENZYL PHTHALATE		UNF	0/5	0/5	-		10 - 20	NA
CHRYSENE		UNF	0/5	0/5	-		10 - 20	NA
DI-N-BUTYL PHTHALATE		UNF	0/5	0/5	-		10 - 20	NA
DI-N-OCTYL PHTHALATE		UNF	0/5	0/5	-		10 - 20	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/5	0/5	-		10 - 20	NA
DIBENZOFURAN		UNF	0/5	0/5	-		10 - 20	NA
DIETHYL PHTHALATE		UNF	1/5	1/5	-	3 - 3	10 - 20	NA
DIMETHYL PHTHALATE		UNF	0/5	0/5	-		10 - 20	NA
FLUORANTHENE		UNF	0/5	0/5	-		10 - 20	NA
FLUORENE		UNF	0/5	0/5	-		10 - 20	NA
HEXACHLOROBENZENE		UNF	0/5	0/5	-		10 - 20	NA
HEXACHLOROBUTADIENE		UNF	0/5	0/5	-		10 - 20	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/5	0/5	-		10 - 20	NA
HEXACHLOROETHANE		UNF	0/5	0/5	-		10 - 20	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/5	0/5	-		10 - 20	NA
ISOPHORONE		UNF	0/5	0/5	-		10 - 20	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	1/5	1/5	-	8 - 8	10 - 20	NA
N-NITROSODIPHENYLAMINE		UNF	0/5	0/5	-		10 - 20	NA
NAPHTHALENE		UNF	0/5	0/5	-		10 - 20	NA
NITROBENZENE		UNF	0/5	0/5	-		10 - 20	NA
P-CHLOROANILINE		UNF	0/5	0/5	-		10 - 20	NA
PENTACHLOROPHENOL		UNF	0/5	0/5	-		50 - 100	NA
PHENANTHRENE		UNF	0/5	0/5	-		10 - 20	NA
PHENOL		UNF	0/5	0/5	-		10 - 20	NA
PYRENE		UNF	0/5	0/5	-		10 - 20	NA
TRIBUTYL PHOSPHATE		UNF	0/1	0/1	-		10 - 10	NA
4,4'-DDD		UNF	0/5	0/5	-		.1 - .2	NA
4,4'-DDE		UNF	0/5	0/5	-		.1 - .2	NA
4,4'-DDT		UNF	1/5	1/5	-	3 - 3	.1 - .2	NA
ALDRIN		UNF	0/5	0/5	-		.05 - .1	NA
ALPHA-BHC		UNF	0/5	0/5	-		.05 - .1	NA
ALPHA-CHLORDANE		UNF	0/5	0/5	-		.5 - 1	NA
AROCLOR-1016		UNF	0/5	0/5	-		.5 - 1	NA
AROCLOR-1221		UNF	0/5	0/5	-		.5 - 1	NA
AROCLOR-1232		UNF	0/5	0/5	-		.5 - 1	NA
AROCLOR-1242		UNF	0/5	0/5	-		.5 - 1	NA
AROCLOR-1248		UNF	0/5	0/5	-		.5 - 2.5	NA
AROCLOR-1254		UNF	0/5	0/5	-		1 - 2	NA
AROCLOR-1260		UNF	0/5	0/5	-		1 - 2	NA
BETA-BHC		UNF	0/5	0/5	-		.05 - .1	NA
DELTA-BHC		UNF	0/5	0/5	-		.05 - .1	NA
DIELDRIN		UNF	0/5	0/5	-		.1 - .2	NA

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TABLE E.1-5
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA IV

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ENDOSULFAN II		UNF	0/5	0/5	-		.1 - .2	NA
ENDOSULFAN SULFATE		UNF	0/5	0/5	-		.1 - .2	NA
ENDOSULFAN-I		UNF	0/5	0/5	-		.05 - .1	NA
ENDRIN		UNF	0/5	0/5	-		.1 - .2	NA
ENDRIN KETONE		UNF	0/5	0/5	-		.1 - .2	NA
GAMMA-BHC (LINDANE)		UNF	0/5	0/5	-		.05 - .1	NA
GAMMA-CHLORDANE		UNF	0/5	0/5	-		.5 - 1	NA
HEPTACHLOR		UNF	0/5	0/5	-		.05 - .1	NA
HEPTACHLOR EPOXIDE		UNF	0/5	0/5	-		.05 - .1	NA
METHOXYCHLOR		UNF	0/5	0/5	-		.5 - 1	NA
TOXAPHENE		UNF	0/5	0/5	-		1 - 2	NA
ALKALINITY AS CACO3		UNF	4/4	4/4	393	338 - 474		NA
AMMONIA	mg/L	UNF	2/8	0/8	-	.23 - .6	.03 - .1	4.34
CHLORIDE	mg/L	UNF	8/8	4/8	70.9	4.14 - 3230		45
FLUORIDE	mg/L	UNF	8/8	0/8	0.29	.2 - .68		1.3
NITRATE	mg/L	UNF	7/8	5/8	4.99	.072 - 554	.1 - .1	0.29
NITRATE, AS NITROGEN		UNF	3/3	3/3	0.39	.24 - 25.2		NA
NITRATE/NITRITE	mg/L	UNF	2/2	2/2	11.3	.3 - 22.4		0.07
PH		UNF	2/2	2/2	7.1	6.89 - 7.25		NA
PHENOLS	mg/L	UNF	1/8	0/8	-	.02 - .02	.005 - .02	0.03
PHOSPHATE		UNF	2/2	2/2	0.159	.159 - .16		NA
PHOSPHORUS		UNF	8/8	8/8	0.32	.06 - 7.13		NA
SPECIFIC CONDUCTIVITY		UNF	2/2	2/2	1484	978 - 1990		NA
SULFATE	mg/L	UNF	8/8	7/8	243	102 - 1287		136
SULFIDE		UNF	0/7	0/7	-		.5 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	2/2	2/2	1056	702 - 1410		452
TOTAL KJELDAHL NITROGEN	mg/L	UNF	4/4	0/4	0.235	.166 - 1.57		4.34
TOTAL ORGANIC CARBON	mg/L	UNF	7/8	0/8	2.3	1 - 5	.01 - .01	9
TOTAL ORGANIC HALIDES	mg/L	UNF	2/8	0/8	-	.015 - .024	.0063 - .01	0.126
TOTAL ORGANIC HALOGENS		UNF	1/3	1/3	-	.526 - .526	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	7/8	2/8	0.183	.166 - 1.34	.1 - .1	0.34
TRANS-1,2-DICHLOROETHENE		UNF	0/3	0/3	-		1 - 1	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000111

TABLE E.1-6
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	21/24	21/24	14	.8 - 3805		ND
URANIUM-238	pCi/L	UNF	31/31	31/31	12.8	.9 - 856		0.8
URANIUM, TOTAL	ug/L	FIL	24/26	24/26	25.1	1.7 - 2360	.1 - .1	1.4
URANIUM, TOTAL	ug/L	UNF	34/34	34/34	35.3	1.8 - 2550		1.3
URANIUM-234	pCi/L	FIL	20/24	20/24	7.7	.8 - 712	.7 - .7	0.6
URANIUM-234	pCi/L	UNF	31/31	31/31	5.7	.9 - 682		0.9
THORIUM-230	pCi/L	FIL	6/24	6/24	-	.29 - .5	.2 - 1	ND
THORIUM-230	pCi/L	UNF	11/31	5/31	-	.26 - 24.6	.2 - 1	1.3
RADIUM-226	pCi/L	FIL	3/24	3/24	-	1.9 - 10.1	1 - 1	0.9
RADIUM-226	pCi/L	UNF	13/30	13/30	-	1.1 - 16.1	1 - 1	0.9
URANIUM-235/236	pCi/L	FIL	11/24	11/24	-	.3 - 76.7	.2 - 1	ND
URANIUM-235/236	pCi/L	UNF	15/31	15/31	-	.208 - 25.1	.2 - 1	ND
THORIUM-232	pCi/L	FIL	2/24	2/24	-	.4 - 2.4	.2 - 1	ND
THORIUM-232	pCi/L	UNF	8/31	7/31	-	.3 - 11.5	.2 - 1	0.34
THORIUM, TOTAL	ug/L	FIL	9/16	9/16	1.5	.912 - 3.648	1.84 - 3	ND
THORIUM, TOTAL	ug/L	UNF	22/29	9/29	2	.7 - 104	.5 - 7	3.1
RADIUM-228	pCi/L	FIL	7/24	7/24	-	5.1 - 10.4	3 - 3	2.2
RADIUM-228	pCi/L	UNF	4/30	4/30	-	3.3 - 4	3 - 3	3
THORIUM-228	pCi/L	FIL	2/24	2/24	-	1.18 - 1.3	.2 - 1	0.1
THORIUM-228	pCi/L	UNF	10/31	2/31	-	.293 - 14	.2 - 1	1.5
NEPTUNIUM-237	pCi/L	FIL	0/7	0/7	-		.5 - 1	not tested
NEPTUNIUM-237	pCi/L	UNF	0/26	0/26	-		.5 - 1	0.25
PLUTONIUM-239/240	pCi/L	FIL	0/9	0/9	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/29	0/29	-		.5 - 1	ND
PLUTONIUM-238	pCi/L	FIL	0/9	0/9	-		.5 - 1	not tested
PLUTONIUM-238	pCi/L	UNF	0/29	0/29	-		.5 - 1	0.075
STRONTIUM-90	pCi/L	FIL	1/9	1/9	-	1.32 - 1.32	1 - 5	not tested
STRONTIUM-90	pCi/L	UNF	4/29	3/29	-	1.35 - 5.3	1 - 5	2
TECHNETIUM-99	pCi/L	FIL	10/24	8/24	-	15.8 - 488	15 - 30	30
TECHNETIUM-99	pCi/L	UNF	6/30	5/30	-	24.4 - 426	15 - 30	30
RUTHENIUM-106	pCi/L	FIL	0/7	0/7	-		150 - 150	not tested
RUTHENIUM-106	pCi/L	UNF	0/26	0/26	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/9	0/9	-		4 - 20	not tested
CESIUM-137	pCi/L	UNF	0/28	0/28	-		4 - 68	ND
GROSS ALPHA		FIL	13/17	13/17	14.2	5.8 - 3670	4.6 - 13.5	NA
GROSS ALPHA		UNF	19/23	19/23	29.5	.8 - 898	8.97 - 390	NA
GROSS BETA		FIL	16/17	16/17	52.1	5.4 - 1170	5.8 - 5.8	NA
GROSS BETA		UNF	20/23	20/23	65.7	5.2 - 1390	6.27 - 470	NA
URANIUM-235		UNF	3/8	3/8	-	1 - 4.8	1 - 1	NA
URANIUM-236		UNF	1/1	1/1	-	.6 - .6		NA
ALUMINUM	mg/L	FIL	9/29	4/29	-	.0144 - 1.59	.0114 - .5	0.123
ALUMINUM	mg/L	UNF	23/28	10/28	0.895	.0961 - 104	.0654 - .804	2.29
ANTIMONY	mg/L	FIL	3/28	3/28	-	.0538 - .0771	.005 - .0467	0.0272
ANTIMONY	mg/L	UNF	4/28	4/28	-	.0616 - .0786	.005 - 2.25	ND
ARSENIC	mg/L	FIL	12/30	1/30	-	.0012 - .191	.001 - .003	0.122
ARSENIC	mg/L	UNF	19/28	2/28	0.003	.0017 - .313	.001 - .01	0.0194
BARIUM	mg/L	FIL	28/30	1/30	0.072	.0166 - .486	.2 - .4	0.451
BARIUM	mg/L	UNF	26/28	20/28	0.089	.0318 - 2.09	.2 - .2	0.0454
BERYLLIUM	mg/L	FIL	1/28	1/28	-	.0022 - .0022	.0003 - .01	0.0018
BERYLLIUM	mg/L	UNF	1/28	1/28	-	.0022 - .0022	.0009 - .01	ND
BORON		FIL	1/2	1/2	-	.67 - .67	.0556 - .0556	NA
BORON		UNF	1/2	1/2	-	.62 - .62	.0556 - .0556	NA
CADMIUM	mg/L	FIL	4/30	3/30	-	.005 - .05	.001 - .005	0.006

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TABLE E.1-6
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CADMIUM	mg/L	UNF	3/28	3/28	-	.003 - .0038	.001 - .005	ND
CALCIUM	mg/L	FIL	30/30	21/30	144	42.8 - 1800		131
CALCIUM	mg/L	UNF	28/28	12/28	157	78 - 526		172
CHROMIUM	mg/L	FIL	9/30	5/30	-	.0066 - .3	.005 - .02	0.034
CHROMIUM	mg/L	UNF	12/28	12/28	-	.008 - .261	.002 - .0403	0.0046
COBALT	mg/L	FIL	8/28	8/28	-	.0063 - .017	.0052 - .025	ND
COBALT	mg/L	UNF	13/28	13/28	-	.0075 - .032	.005 - .025	ND
COPPER	mg/L	FIL	6/30	3/30	-	.005 - .06	.0024 - .025	0.019
COPPER	mg/L	UNF	9/28	7/28	-	.0221 - .199	.004 - .025	0.0294
CYANIDE	mg/L	FIL	1/20	1/20	-	.0295 - .0295	.002 - .02	ND
CYANIDE	mg/L	UNF	2/30	2/30	-	.0099 - .0303	.002 - .02	ND
IRON	mg/L	FIL	12/30	0/30	-	.05 - 14.2	.02 - .233	3058
IRON	mg/L	UNF	24/28	11/28	2.16	.285 - 340	.0466 - .477	6.35
LEAD	mg/L	FIL	3/30	0/30	-	.0013 - .002	.001 - .005	0.0087
LEAD	mg/L	UNF	12/28	12/28	-	.0023 - 1.15	.001 - .0178	0.0016
MAGNESIUM	mg/L	FIL	30/30	24/30	64.1	14 - 690		47.8
MAGNESIUM	mg/L	UNF	28/28	24/28	75	14.1 - 335		50.7
MANGANESE	mg/L	FIL	23/30	13/30	0.075	.009 - 35	.001 - .02	0.18
MANGANESE	mg/L	UNF	27/28	14/28	0.182	.015 - 11.1	.001 - .001	0.205
MERCURY	mg/L	FIL	2/30	2/30	-	.0002 - .0004	.0001 - .001	ND
MERCURY	mg/L	UNF	1/28	1/28	-	.0006 - .0006	.0001 - .0002	ND
MOLYBDENUM	mg/L	FIL	10/29	8/29	-	.0131 - 1.01	.005 - .049	0.017
MOLYBDENUM	mg/L	UNF	8/26	8/26	-	.0158 - .75	.0053 - .025	ND
NICKEL	mg/L	FIL	7/30	7/30	-	.0228 - .981	.005 - .03	0.022
NICKEL	mg/L	UNF	11/28	11/28	-	.0206 - .829	.005 - .0477	0.0072
OSMIUM		FIL	0/6	0/6	-		.05 - .128	NA
POTASSIUM	mg/L	FIL	27/30	2/30	2.33	1.25 - 100	.891 - 1.27	29.3
POTASSIUM	mg/L	UNF	27/28	4/28	3.35	.829 - 82	1 - 1	17.2
SELENIUM	mg/L	FIL	3/30	3/30	-	.0022 - .0058	.001 - .02	ND
SELENIUM	mg/L	UNF	2/28	2/28	-	.0022 - .0074	.001 - .02	ND
SILICON	mg/L	FIL	11/11	6/11	8.08	3.37 - 15		7.43
SILICON	mg/L	UNF	10/10	3/10	9.24	4.55 - 72.1		10.7
SILVER	mg/L	FIL	3/30	0/30	-	.01 - .0202	.001 - .05	0.04
SILVER	mg/L	UNF	7/28	5/28	-	.002 - .0201	.001 - .01	0.0031
SODIUM	mg/L	FIL	30/30	10/30	26.15	3.86 - 1300		38.3
SODIUM	mg/L	UNF	28/28	7/28	22.4	8.42 - 404		50
THALLIUM	mg/L	FIL	1/28	1/28	-	.001 - .001	.001 - .041	ND
THALLIUM	mg/L	UNF	1/28	1/28	-	.006 - .006	.001 - .01	ND
TIN		FIL	0/10	0/10	-		.03 - 2	NA
TIN		UNF	0/5	0/5	-		1 - 2	NA
VANADIUM	mg/L	FIL	3/29	2/29	-	.0043 - .0611	.0029 - .05	0.0195
VANADIUM	mg/L	UNF	9/28	9/28	-	.0088 - 3.25	.003 - .05	0.0051
ZINC	mg/L	FIL	8/28	3/28	-	.0087 - .0579	.004 - .0321	0.0443
ZINC	mg/L	UNF	12/28	2/28	-	.006 - 3380	.006 - .136	0.352
1,1,1,2-TETRACHLOROETHANE		UNF	0/14	0/14	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	2/33	2/33	-	3 - 8	1 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/33	0/33	-		1 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/33	0/33	-		1 - 10	NA
1,1-DICHLOROETHANE		UNF	3/33	3/33	-	2.3 - 48	1 - 10	NA
1,1-DICHLOROETHENE		UNF	2/33	2/33	-	2 - 5	1 - 10	NA
1,2-DICHLOROETHANE		UNF	0/33	0/33	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	3/33	3/33	-	8.5 - 60	1 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/33	0/33	-		1 - 10	NA

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TABLE E.1-6
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2-BUTANONE		UNF	1/33	1/33	-	5 - 5	2 - 10	NA
2-HEXANONE		UNF	0/33	0/33	-		2 - 15	NA
4-METHYL-2-PENTANONE		UNF	2/33	2/33	-	7 - 18	2 - 10	NA
ACETONE		UNF	1/33	1/33	-	6 - 6	2 - 33	NA
BENZENE		UNF	2/33	2/33	-	2 - 4	1 - 10	NA
BROMODICHLOROMETHANE		UNF	0/33	0/33	-		1 - 10	NA
BROMOFORM		UNF	0/33	0/33	-		1 - 10	NA
BROMOMETHANE		UNF	0/33	0/33	-		1 - 10	NA
CARBON DISULFIDE		UNF	0/33	0/33	-		1 - 10	NA
CARBON TETRACHLORIDE		UNF	0/33	0/33	-		1 - 10	NA
CHLOROBENZENE		UNF	0/33	0/33	-		1 - 10	NA
CHLOROETHANE		UNF	0/32	0/32	-		1 - 10	NA
CHLOROFORM		UNF	1/33	1/33	-	2 - 2	1 - 10	NA
CHLOROMETHANE		UNF	0/33	0/33	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/33	0/33	-		1 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/33	0/33	-		1 - 10	NA
ETHYLBENZENE		UNF	0/33	0/33	-		1 - 10	NA
ISOBUTYL ALCOHOL		UNF	0/6	0/6	-		3000 - 3000	NA
METHYLENE CHLORIDE		UNF	1/33	1/33	-	4 - 4	1 - 16	NA
STYRENE		UNF	1/33	1/33	-	3 - 3	1 - 10	NA
T-1,4-DICHLORO-2-BUTENE		UNF	0/5	0/5	-		20 - 100	NA
TETRACHLOROETHENE		UNF	1/33	1/33	-	170 - 170	1 - 10	NA
TOLUENE		UNF	1/33	1/33	-	10 - 10	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/33	0/33	-		1 - 10	NA
TRICHLOROETHENE		UNF	2/33	2/33	-	2 - 290	1 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/14	0/14	-		1 - 1	NA
VINYL ACETATE		UNF	0/30	0/30	-		2 - 10	NA
VINYL CHLORIDE		UNF	1/33	1/33	-	9 - 9	1 - 10	NA
XYLENES, TOTAL		UNF	1/33	1/33	-	6 - 6	1 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/30	0/30	-		4 - 20	NA
1,2-DICHLOROBENZENE		UNF	0/24	0/24	-		10 - 20	NA
1,3-DICHLOROBENZENE		UNF	0/30	0/30	-		4 - 20	NA
1,4-DICHLOROBENZENE		UNF	0/30	0/30	-		4 - 20	NA
2,4,5-TRICHLOROPHENOL		UNF	0/30	0/30	-		4 - 100	NA
2,4,6-TRICHLOROPHENOL		UNF	0/30	0/30	-		4 - 20	NA
2,4-DICHLOROPHENOL		UNF	0/30	0/30	-		4 - 20	NA
2,4-DIMETHYLPHENOL		UNF	0/30	0/30	-		4 - 20	NA
2,4-DINITROPHENOL		UNF	0/30	0/30	-		4 - 100	NA
2,4-DINITROTOLUENE		UNF	0/30	0/30	-		10 - 20	NA
2,6-DINITROTOLUENE		UNF	0/30	0/30	-		10 - 20	NA
2-BENZYL-4-CHLOROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/17	0/17	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/30	0/30	-		4 - 20	NA
2-CHLOROPHENOL		UNF	0/30	0/30	-		4 - 20	NA
2-METHYLNAPHTHALENE		UNF	0/28	0/28	-		4 - 20	NA
2-METHYLPHENOL		UNF	0/30	0/30	-		4 - 20	NA
2-NITROANILINE		UNF	0/30	0/30	-		15 - 100	NA
2-NITROPHENOL		UNF	0/30	0/30	-		4 - 20	NA
3,3'-DICHLOROBENZIDINE		UNF	0/30	0/30	-		10 - 40	NA
3-NITROANILINE		UNF	0/30	0/30	-		15 - 100	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/30	0/30	-		4 - 100	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/30	0/30	-		10 - 20	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/30	0/30	-		4 - 20	NA

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SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-CHLOROPHENYLPHENYL ETHER		UNF	0/30	0/30	-		10 - 20	NA
4-METHYLPHENOL		UNF	0/24	0/24	-		10 - 20	NA
4-NITROANILINE		UNF	0/30	0/30	-		15 - 100	NA
4-NITROPHENOL		UNF	1/30	1/30	-	3 - 3	4 - 100	NA
ACENAPHTHENE		UNF	0/28	0/28	-		4 - 20	NA
ACENAPHTHYLENE		UNF	0/30	0/30	-		4 - 20	NA
ANTHRACENE		UNF	0/30	0/30	-		4 - 20	NA
BENZO(A)ANTHRACENE		UNF	0/30	0/30	-		4 - 20	NA
BENZO(A)PYRENE		UNF	0/30	0/30	-		4 - 20	NA
BENZO(B)FLUORANTHENE		UNF	0/30	0/30	-		4 - 20	NA
BENZO(G,H,I)PERYLENE		UNF	0/30	0/30	-		4 - 20	NA
BENZO(K)FLUORANTHENE		UNF	0/30	0/30	-		4 - 20	NA
BENZOIC ACID		UNF	1/24	1/24	-	4 - 4	4 - 100	NA
BENZYL ALCOHOL		UNF	0/28	0/28	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/30	0/30	-		10 - 20	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/30	0/30	-		10 - 20	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/30	0/30	-		4 - 20	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	1/30	1/30	-	2 - 2	4 - 20	NA
BUTYL BENZYL PHTHALATE		UNF	2/30	2/30	-	3 - 3	4 - 20	NA
CARBAZOLE		UNF	0/9	0/9	-		10 - 20	NA
CHRYSENE		UNF	0/30	0/30	-		4 - 20	NA
CUMENE		UNF	0/16	0/16	-		1 - 5	NA
DI-N-BUTYL PHTHALATE		UNF	1/30	1/30	-	3 - 3	4 - 20	NA
DI-N-OCTYL PHTHALATE		UNF	0/28	0/28	-		4 - 20	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/29	0/29	-		4 - 20	NA
DIBENZOFURAN		UNF	0/30	0/30	-		4 - 20	NA
DIETHYL PHTHALATE		UNF	0/30	0/30	-		4 - 20	NA
DIMETHYL PHTHALATE		UNF	0/30	0/30	-		4 - 20	NA
FLUORANTHENE		UNF	0/30	0/30	-		4 - 20	NA
FLUORENE		UNF	0/30	0/30	-		4 - 20	NA
HEXACHLOROBENZENE		UNF	0/30	0/30	-		4 - 20	NA
HEXACHLOROBUTADIENE		UNF	0/30	0/30	-		4 - 20	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/30	0/30	-		4 - 20	NA
HEXACHLOROETHANE		UNF	0/30	0/30	-		4 - 20	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/30	0/30	-		4 - 20	NA
ISOPHORONE		UNF	0/30	0/30	-		4 - 20	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/30	0/30	-		4 - 20	NA
N-NITROSODIMETHYLAMINE		UNF	0/12	0/12	-		4 - 100	NA
N-NITROSODIPHENYLAMINE		UNF	0/30	0/30	-		4 - 20	NA
NAPHTHALENE		UNF	0/30	0/30	-		4 - 20	NA
NITROBENZENE		UNF	0/30	0/30	-		10 - 20	NA
O,O,O-TRIETHYLPHOSPHOROTHIOATE		UNF	0/6	0/6	-		4 - 20	NA
P-CHLOROANILINE		UNF	0/30	0/30	-		4 - 100	NA
PENTACHLOROPHENOL		UNF	1/30	1/30	-	7 - 7	4 - 20	NA
PHENANTHRENE		UNF	0/30	0/30	-		4 - 20	NA
PHENOL		UNF	0/30	0/30	-		4 - 20	NA
PYRENE		UNF	0/30	0/30	-		4 - 4	NA
PYRIDINE		UNF	0/13	0/13	-		10 - 10	NA
TRIBUTYL PHOSPHATE		UNF	1/6	1/6	-	320 - 320	.1 - 1	NA
4,4'-DDD		UNF	0/26	0/26	-		.1 - 1	NA
4,4'-DDE		UNF	0/26	0/26	-		.1 - 1	NA
4,4'-DDT		UNF	0/26	0/26	-		.05 - 1	NA
ALDRIN		UNF	0/26	0/26	-			

000115

TABLE E.1-6
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ALPHA-BHC		UNF	0/26	0/26	-		.05 - 1	NA
ALPHA-CHLORDANE		UNF	0/20	0/20	-		.05 - 2.5	NA
AROCLOR-1016		UNF	0/26	0/26	-		.2 - 2.5	NA
AROCLOR-1221		UNF	0/26	0/26	-		.2 - 10	NA
AROCLOR-1232		UNF	0/26	0/26	-		.2 - 2.5	NA
AROCLOR-1242		UNF	0/26	0/26	-		.2 - 2.5	NA
AROCLOR-1248		UNF	0/26	0/26	-		.2 - 2.5	NA
AROCLOR-1254		UNF	0/26	0/26	-		.2 - 5	NA
AROCLOR-1260		UNF	0/26	0/26	-		.2 - 5	NA
BETA-BHC		UNF	0/26	0/26	-		.05 - 1	NA
CHLORDANE		UNF	0/13	0/13	-		.2 - 1	NA
CHLOROBENZILATE		UNF	0/5	0/5	-		15 - 15	NA
DELTA-BHC		UNF	0/26	0/26	-		.05 - 1	NA
DIELDRIN		UNF	0/26	0/26	-		.05 - 1	NA
ENDOSULFAN II		UNF	0/26	0/26	-		.1 - 1	NA
ENDOSULFAN SULFATE		UNF	0/26	0/26	-		.1 - 1	NA
ENDOSULFAN-I		UNF	0/26	0/26	-		.05 - 1	NA
ENDRIN		UNF	0/26	0/26	-		.05 - 1	NA
ENDRIN ALDEHYDE		UNF	0/16	0/16	-		.1 - 1	NA
ENDRIN KETONE		UNF	0/20	0/20	-		.1 - .5	NA
GAMMA-BHC (LINDANE)		UNF	0/26	0/26	-		.05 - 1	NA
GAMMA-CHLORDANE		UNF	0/20	0/20	-		.05 - 2.5	NA
HEPTACHLOR		UNF	0/26	0/26	-		.05 - 1	NA
HEPTACHLOR EPOXIDE		UNF	0/26	0/26	-		.05 - 1	NA
METHOXYCHLOR		UNF	0/21	0/21	-		.2 - 2.5	NA
SULFOTEP		UNF	0/9	0/9	-		1 - 15	NA
TOXAPHENE		UNF	0/26	0/26	-		.2 - 5	NA
2,4,5-T		UNF	0/7	0/7	-		.1 - 5	NA
2,4,5-TP (SILVEX)		UNF	0/7	0/7	-		.025 - .5	NA
2,4-D		UNF	0/7	0/7	-		.05 - 1	NA
AZINPHOSMETHYL		UNF	0/9	0/9	-		.5 - 5	NA
DEMETON		UNF	0/9	0/9	-		.25 - 1	NA
DIAZINON		UNF	0/9	0/9	-		.25 - .5	NA
DIMETHOATE		UNF	0/9	0/9	-		1 - 15	NA
DISULFOTON		UNF	0/16	0/16	-		.25 - 15	NA
ETHION		UNF	0/9	0/9	-		.25 - .5	NA
FAMPHUR		UNF	0/9	0/9	-		1 - 15	NA
MALATHION		UNF	0/9	0/9	-		.25 - 1	NA
METHYL PARATHION		UNF	0/16	0/16	-		.05 - 15	NA
PARATHION		UNF	0/16	0/16	-		.05 - 15	NA
PHORATE		UNF	0/9	0/9	-		1 - 15	NA
THIONAZIN		UNF	0/9	0/9	-		1 - 15	NA
1,4-DIOXANE		UNF	0/6	0/6	-		1000 - 5000	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN		UNF	0/5	0/5	-		.69 - 5.9	NA
2,3,7,8-TETRACHLORODIBENZOFURAN		UNF	0/2	0/2	-		2.6 - 3.1	NA
HEPTACHLORODIBENZO-P-DIOXINS		UNF	0/3	0/3	-		.76 - 2.4	NA
HEPTACHLORODIBENZOFURANS		UNF	0/3	0/3	-		1.1 - 1.6	NA
HEXACHLORODIBENZO-P-DIOXINS		UNF	0/6	0/6	-		.67 - 2.8	NA
HEXACHLORODIBENZOFURANS		UNF	1/6	1/6	-	.32 - .32	.27 - 1.6	NA
OCTACHLORODIBENZO-P-DIOXIN		UNF	0/3	0/3	-		2.6 - 7.8	NA
OCTACHLORODIBENZOFURAN		UNF	0/3	0/3	-		1.8 - 6.5	NA
PENTACHLORODIBENZO-P-DIOXINS		UNF	0/6	0/6	-		.072 - 3.1	NA
PENTACHLORODIBENZOFURANS		UNF	1/6	1/6	-	.35 - .35	.088 - 1.5	NA

000116

TABLE E.1-6
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
TETRACHLORODIBENZO-P-DIOXINS		UNF	0/5	0/5	-		.19 - .44	NA
TETRACHLORODIBENZOFURANS		UNF	1/6	1/6	-	.12 - .12	.38 - .71	NA
ALKALINITY AS CACO3		UNF	28/29	28/29	400	150 - 652	440 - 440	NA
ALLYL CHLORIDE		UNF	0/14	0/14	-		5 - 5	NA
AMMONIA	mg/L	UNF	19/33	3/33	0.12	.06 - 220	.02 - .4	4.34
BICARBONATE		UNF	1/1	1/1	-	560 - 560		NA
BICARBONATE ALKALINITY		UNF	14/14	14/14	502	98 - 781		NA
CARBONATE ALKALINITY		UNF	1/15	1/15	-	66 - 66	1 - 3	NA
CHLORIDE	mg/L	UNF	32/34	15/34	29.5	.5 - 6300	8.2 - 13	45
FLUORIDE	mg/L	UNF	34/34	5/34	0.7	.19 - 6.76		1.3
NITRATE	mg/L	UNF	23/30	11/30	0.15	.04 - 197	.02 - .1	0.29
NITRATE, AS NITROGEN		UNF	13/19	13/19	0.05	.03 - 247	.02 - .1	NA
NITRATE/NITRITE	mg/L	UNF	10/20	9/20	0.09	.04 - 10000	.02 - 50	0.07
NITRITE, AS NITROGEN		UNF	2/14	2/14	-	.04 - 20.7	.02 - .02	NA
PH		UNF	17/17	17/17	7.26	6.7 - 8.89		NA
PHENOLS	mg/L	UNF	3/34	0/34	-	.005 - .019	.002 - .01	0.03
PHOSPHATE		UNF	0/2	0/2	-			NA
PHOSPHORUS		UNF	27/32	27/32	0.18	.02 - 2.63	.01 - .1	NA
SPECIFIC CONDUCTIVITY		UNF	17/17	17/17	1200	340 - 4820		NA
SULFATE	mg/L	UNF	34/34	21/34	184	13 - 1200		136
SULFIDE		FIL	0/1	0/1	-		1 - 1	NA
SULFIDE		UNF	3/19	3/19	-	1.28 - 7.87	.2 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	FIL	14/14	13/14	-	220 - 3530		433
TOTAL DISSOLVED SOLIDS	mg/L	UNF	18/18	17/18	790	268 - 3440		452
TOTAL KJELDAHL NITROGEN	mg/L	UNF	23/28	5/28	0.3	.1 - 260	.1 - .3	4.34
TOTAL ORGANIC CARBON	mg/L	UNF	24/30	14/30	8	1.74 - 33	1 - 1	9
TOTAL ORGANIC HALIDES	mg/L	UNF	13/34	4/34	-	.01 - .734	.01 - .05	0.126
TOTAL ORGANIC HALOGENS		UNF	10/18	10/18	0.018	.014 - .56	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	26/32	8/32	0.24	0 - 40	.1 - .3	0.34
TOTAL SOLIDS		UNF	14/14	14/14	908	230 - 3570		NA
TOTAL SUSPENDED SOLIDS		UNF	0/1	0/1	-		4 - 4	NA
1,2,3-TRICHLOROPROPANE		UNF	0/14	0/14	-		5 - 5	NA
1,2,4,5-TETRACHLOROBENZENE		UNF	0/10	0/10	-		4 - 20	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/14	0/14	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/14	0/14	-		2 - 2	NA
1,3,5-TRINITROBENZENE		UNF	0/10	0/10	-		10 - 20	NA
1,3-DINITROBENZENE		UNF	0/10	0/10	-		10 - 20	NA
1,4-NAPHTHOQUINONE		UNF	0/10	0/10	-		10 - 15	NA
1-NAPHTHYLAMINE		UNF	0/10	0/10	-		15 - 240	NA
2,3,4,6-TETRACHLOROPHENOL		UNF	1/10	1/10	-	4.2 - 4.2	4 - 10	NA
2,6-DICHLOROPHENOL		UNF	0/10	0/10	-		4 - 20	NA
2-ACETYLAMINOFLUORENE		UNF	0/10	0/10	-		10 - 20	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/14	0/14	-		5 - 5	NA
2-NAPHTHYLAMINE		UNF	0/10	0/10	-		4 - 340	NA
2-PICOLINE		UNF	0/10	0/10	-		15 - 70	NA
3,3'-DIMETHYLBENZIDINE		UNF	0/10	0/10	-		15 - 80	NA
3-CHLOROPROPENE		UNF	0/5	0/5	-		5 - 50	NA
3-METHYLCHOLANTHRENE		UNF	0/10	0/10	-		15 - 30	NA
3-METHYLPHENOL		UNF	0/13	0/13	-		4 - 4	NA
4-AMINOBIPHENYL		UNF	0/10	0/10	-		15 - 100	NA
4-NITROQUINOLINE-1-OXIDE		UNF	0/10	0/10	-		10 - 20	NA
5-NITRO-O-TOLUIDINE		UNF	0/10	0/10	-		15 - 20	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE		UNF	0/10	0/10	-		15 - 40	NA

000117

TABLE E.1-6
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA V

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
A,A-DIMETHYLPHENETHYLAMINE		UNF	0/10	0/10	-		10 - 20	NA
ACETONITRILE		UNF	0/6	0/6	-		200 - 2000	NA
ACETOPHENONE		UNF	0/10	0/10	-		10 - 15	NA
ACROLEIN		UNF	0/14	0/14	-		50 - 50	NA
ACROLEIN		UNF	0/14	0/14	-		50 - 50	NA
ACRYLONITRILE		UNF	0/14	0/14	-		50 - 50	NA
ANILINE		UNF	0/10	0/10	-		4 - 10	NA
ARAMITE		UNF	0/10	0/10	-		10 - 15	NA
DIALLATE		UNF	0/10	0/10	-		10 - 15	NA
DIBROMOMETHANE		UNF	0/9	0/9	-		1 - 10	NA
DICHLORODIFLUOROMETHANE		UNF	0/14	0/14	-		10 - 10	NA
DINOSEB		UNF	0/7	0/7	-		.5 - 20	NA
DIPHENYLAMINE		UNF	0/13	0/13	-		15 - 15	NA
ETHYL CYANIDE		UNF	0/14	0/14	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/14	0/14	-		5 - 5	NA
ETHYL METHANESULFONATE		UNF	0/10	0/10	-		10 - 20	NA
HEXACHLOROPHENE		UNF	0/10	0/10	-		4 - 1000	NA
HEXACHLOROPROPENE		UNF	0/10	0/10	-		4 - 20	NA
IODOMETHANE		UNF	0/14	0/14	-		5 - 5	NA
ISODRIN		UNF	0/10	0/10	-		.05 - 4	NA
ISOSAFROLE		UNF	0/10	0/10	-		10 - 20	NA
KEPONE		UNF	0/10	0/10	-		.1 - 4	NA
METHACRYLONITRILE		UNF	0/14	0/14	-		5 - 5	NA
METHAPYRILENE		UNF	0/10	0/10	-		15 - 40	NA
METHYL METHACRYLATE		UNF	0/14	0/14	-		5 - 5	NA
METHYL METHANESULFONATE		UNF	0/10	0/10	-		10 - 20	NA
N-NITROSODI-N-BUTYLAMINE		UNF	0/10	0/10	-		4 - 40	NA
N-NITROSODIETHYLAMINE		UNF	1/10	1/10	-	4 - 4	4 - 10	NA
N-NITROSOMETHYLETHYLAMINE		UNF	0/10	0/10	-		4 - 20	NA
N-NITROSOMORPHOLINE		UNF	0/10	0/10	-		10 - 15	NA
N-NITROSOPIPERIDINE		UNF	0/10	0/10	-		10 - 20	NA
N-NITROSOPYRROLIDINE		UNF	0/10	0/10	-		10 - 15	NA
O-TOLUIDINE		UNF	0/10	0/10	-		10 - 20	NA
P-DIMETHYLAMINOAZOBENZENE		UNF	0/10	0/10	-		15 - 60	NA
P-PHENYLENEDIAMINE		UNF	0/10	0/10	-		15 - 50	NA
PENTACHLOROBENZENE		UNF	0/10	0/10	-		4 - 20	NA
PENTACHLOROETHANE		UNF	0/14	0/14	-		5 - 5	NA
PENTACHLORONITROBENZENE		UNF	0/10	0/10	-		4 - 20	NA
PHENACETIN		UNF	0/10	0/10	-		4 - 10	NA
PRONAMIDE		UNF	0/10	0/10	-		15 - 30	NA
SAFROLE		UNF	0/10	0/10	-		10 - 20	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/17	0/17	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/14	0/14	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

6161
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TABLE E.1-7
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VI

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	5/5	5/5	3.7	1.1 - 46.4		ND
URANIUM-238	pCi/L	UNF	3/6	3/6	14.2	3.28 - 15.2		0.8
URANIUM, TOTAL	ug/L	FIL	6/6	6/6	16.4	4.1 - 138		1.4
URANIUM, TOTAL	ug/L	UNF	9/9	9/9	23.4	7.7 - 168		1.3
URANIUM-234	pCi/L	FIL	5/5	5/5	4.4	1.6 - 47.8		0.6
URANIUM-234	pCi/L	UNF	3/6	3/6	12.7	3.63 - 15.7		0.9
THORIUM-230	pCi/L	FIL	2/6	2/6	-	.727 - 1.41	.2 - .3	ND
THORIUM-230	pCi/L	UNF	5/6	2/6	0.85	.6 - 3.44		1.3
RADIUM-226	pCi/L	FIL	0/6	0/6	-		.09 - 1	0.9
RADIUM-226	pCi/L	UNF	4/6	4/6	3	2.6 - 4.5	1 - 1	0.9
URANIUM-235/236	pCi/L	FIL	3/5	3/5	0.236	.236 - 2.6	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	2/6	2/6	-	.8 - 1.2	.2 - .2	ND
THORIUM-232	pCi/L	FIL	1/6	1/6	-	1.167 - 1.167	.2 - .2	ND
THORIUM-232	pCi/L	UNF	2/6	2/6	-	.4727 - 2.84	.2 - .2	0.34
THORIUM, TOTAL	ug/L	FIL	2/3	2/3	0.912	.912 - 10.6	1.28 - 1.28	ND
THORIUM, TOTAL	ug/L	UNF	6/6	5/6	5.47	1.8241 - 25.6		3.1
RADIUM-228	pCi/L	FIL	1/6	1/6	-	4.7 - 4.7	.033 - 3	2.2
RADIUM-228	pCi/L	UNF	1/6	1/6	-	5.1 - 5.1	3 - 3	3
THORIUM-228	pCi/L	FIL	1/6	1/6	-	1 - 1	-.014 - .2	0.1
THORIUM-228	pCi/L	UNF	4/6	1/6	0.59	.488 - 3.4	.2 - .2	1.5
NEPTUNIUM-237	pCi/L	FIL	1/2	1/2	0.54	.954 - .954	.2508 - .2508	not tested
NEPTUNIUM-237	pCi/L	UNF	1/4	1/4	-	.6258 - .6258	1 - 1	0.25
PLUTONIUM-239/240	pCi/L	FIL	1/2	1/2	0.54	1 - 1	.1564 - .1564	ND
PLUTONIUM-239/240	pCi/L	UNF	0/5	0/5	-		.5 - 1	ND
PLUTONIUM-238	pCi/L	FIL	1/2	1/2	0.5	1 - 1	0 - 0	not tested
PLUTONIUM-238	pCi/L	UNF	0/5	0/5	-		.5 - 1	0.075
STRONTIUM-90	pCi/L	FIL	0/3	0/3	-		-.115 - 1	not tested
STRONTIUM-90	pCi/L	UNF	0/5	0/5	-		1 - 5	2
TECHNETIUM-99	pCi/L	FIL	2/5	1/5	-	27.7 - 63.1	-1.82 - 15	30
TECHNETIUM-99	pCi/L	UNF	2/5	2/5	-	56.5 - 60.8	15 - 30	30
RUTHENIUM-106	pCi/L	FIL	0/2	0/2	-		110 - 130	not tested
RUTHENIUM-106	pCi/L	UNF	0/4	0/4	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	1/2	1/2	13.3	20 - 20	13 - 13	not tested
CESIUM-137	pCi/L	UNF	1/5	1/5	-	4.9 - 4.9	9.9 - 20	ND
GROSS ALPHA		FIL	5/6	5/6	17.2	1.42 - 58.3	4.2 - 4.2	NA
GROSS ALPHA		UNF	5/6	5/6	64.1	11.1 - 486	270 - 270	NA
GROSS BETA		FIL	5/6	5/6	18	12.2 - 51.9	5.2 - 5.2	NA
GROSS BETA		UNF	4/6	4/6	110.7	26.2 - 730	22.5 - 780	NA
ALUMINUM	mg/L	FIL	4/7	3/7	0.092	.0917 - 1.49	.06 - .06	0.123
ALUMINUM	mg/L	UNF	7/7	5/7	9.79	.0893 - 470		2.29
ANTIMONY	mg/L	FIL	0/7	0/7	-		.005 - .03	0.0272
ANTIMONY	mg/L	UNF	0/7	0/7	-		.005 - .111	ND
ARSENIC	mg/L	FIL	3/7	0/7	-	.0022 - .0035	.002 - .002	0.122
ARSENIC	mg/L	UNF	1/7	0/7	-	.002 - .002	.001 - .002	0.0194
BARIUM	mg/L	FIL	7/7	0/7	0.082	.0531 - .127		0.451
BARIUM	mg/L	UNF	7/7	7/7	0.144	.0649 - 3.35		0.0454
BERYLLIUM	mg/L	FIL	0/7	0/7	-		.0003 - .002	0.0018
BERYLLIUM	mg/L	UNF	2/7	2/7	-	.0011 - .0231	.0004 - .002	ND
CADMIUM	mg/L	FIL	1/7	0/7	-	.0033 - .0033	.0012 - .005	0.006
CADMIUM	mg/L	UNF	2/7	2/7	-	.0054 - .0065	.0012 - .006	ND
CALCIUM	mg/L	FIL	7/7	0/7	112	103 - 130		131
CALCIUM	mg/L	UNF	7/7	2/7	137	120 - 4580		172
CHROMIUM	mg/L	FIL	1/7	0/7	-	.0252 - .0252	.0031 - .01	0.034

000119

TABLE E.1-7
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VI

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHROMIUM	mg/L	UNF	6/7	6/7	0.031	.0173 - .82	.0097 - .0097	0.0046
COBALT	mg/L	FIL	0/7	0/7	-		.0034 - .01	ND
COBALT	mg/L	UNF	1/7	1/7	-	.489 - .489	.0065 - .0186	ND
COPPER	mg/L	FIL	0/7	0/7	-		.0024 - .01	0.019
COPPER	mg/L	UNF	7/7	2/7	0.016	.0103 - 1.03		0.0294
CYANIDE	mg/L	FIL	0/3	0/3	-		.01 - .01	ND
CYANIDE	mg/L	UNF	1/9	1/9	-	.0022 - .0022	.002 - .01	ND
IRON	mg/L	FIL	3/7	0/7	-	.0592 - 1.61	.02 - .0474	3058
IRON	mg/L	UNF	7/7	5/7	14.1	.0385 - 1110		6.35
LEAD	mg/L	FIL	3/7	0/7	-	.001 - .0053	.001 - .002	0.0087
LEAD	mg/L	UNF	4/7	4/7	0.004	.0036 - .0107	.001 - .002	0.0016
MAGNESIUM	mg/L	FIL	7/7	1/7	34.2	23.4 - 49.3		47.8
MAGNESIUM	mg/L	UNF	7/7	4/7	52.2	30.7 - 1530		50.7
MANGANESE	mg/L	FIL	6/7	3/7	0.078	.0758 - 1.47	.0044 - .0044	0.18
MANGANESE	mg/L	UNF	7/7	7/7	0.786	.232 - 24.3		0.205
MERCURY	mg/L	FIL	0/7	0/7	-		.0002 - .0002	ND
MERCURY	mg/L	UNF	1/7	1/7	-	.0004 - .0004	.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/5	0/5	-		.01 - .02	0.017
MOLYBDENUM	mg/L	UNF	0/4	0/4	-		.01 - .02	ND
NICKEL	mg/L	FIL	2/7	1/7	-	.0093 - .0256	.007 - .02	0.022
NICKEL	mg/L	UNF	5/7	5/7	0.021	.0146 - 1.47	.02 - .02	0.0072
POTASSIUM	mg/L	FIL	7/7	0/7	1.32	.737 - 4.23		29.3
POTASSIUM	mg/L	UNF	7/7	1/7	4.43	1.06 - 48.1		17.2
SELENIUM	mg/L	FIL	1/7	1/7	-	.0024 - .0024	.001 - .002	ND
SELENIUM	mg/L	UNF	1/7	1/7	-	.0016 - .0016	.001 - .01	ND
SILICON	mg/L	FIL	2/2	1/2	7.64	7.4 - 7.88		7.43
SILICON	mg/L	UNF	1/1	1/1	-	27 - 27		10.7
SILVER	mg/L	FIL	1/7	0/7	-	.0179 - .0179	.0029 - .01	0.04
SILVER	mg/L	UNF	2/7	2/7	-	.0215 - .0216	.0029 - .016	0.0031
SODIUM	mg/L	FIL	7/7	1/7	20	6.67 - 42.3		38.3
SODIUM	mg/L	UNF	7/7	0/7	16.6	7 - 31.2		50
THALLIUM	mg/L	FIL	0/7	0/7	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/7	0/7	-		.001 - .002	ND
VANADIUM	mg/L	FIL	2/7	0/7	-	.0029 - .0143	.0029 - .01	0.0195
VANADIUM	mg/L	UNF	7/7	7/7	0.018	.0086 - .699		0.0051
ZINC	mg/L	FIL	2/7	0/7	-	.006 - .01	.004 - .036	0.0443
ZINC	mg/L	UNF	5/7	1/7	0.05	.023 - 2.91	.0103 - .0177	0.352
1,1,1-TRICHLOROETHANE		UNF	2/9	2/9	-	28 - 82	5 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/9	0/9	-		5 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/9	0/9	-		5 - 10	NA
1,1-DICHLOROETHANE		UNF	6/9	6/9	3	2 - 520	5 - 10	NA
1,1-DICHLOROETHENE		UNF	2/9	2/9	-	3 - 14	5 - 10	NA
1,2-DICHLOROETHANE		UNF	0/9	0/9	-		5 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	5/9	5/9	2.5	.6 - 150	5 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/9	0/9	-		5 - 10	NA
2-BUTANONE		UNF	1/9	1/9	-	20 - 20	10 - 10	NA
2-HEXANONE		UNF	0/9	0/9	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/9	0/9	-		10 - 10	NA
ACETONE		UNF	1/9	1/9	-	120 - 120	10 - 10	NA
BENZENE		UNF	0/9	0/9	-		5 - 10	NA
BROMODICHLOROMETHANE		UNF	0/9	0/9	-		5 - 10	NA
BROMOFORM		UNF	0/9	0/9	-		5 - 10	NA
BROMOMETHANE		UNF	0/9	0/9	-		10 - 10	NA

1919
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TABLE E.1-7

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VI

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBON DISULFIDE		UNF	0/9	0/9	-		5 - 10	NA
CARBON TETRACHLORIDE		UNF	0/9	0/9	-		5 - 10	NA
CHLOROBENZENE		UNF	1/9	1/9	-	1 - 1	5 - 10	NA
CHLOROETHANE		UNF	2/9	2/9	-	8 - 24	10 - 10	NA
CHLOROFORM		UNF	0/9	0/9	-		5 - 10	NA
CHLOROMETHANE		UNF	1/9	1/9	-	.6 - .6	10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/9	0/9	-		5 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/9	0/9	-		5 - 10	NA
ETHYLBENZENE		UNF	0/9	0/9	-		5 - 10	NA
METHYLENE CHLORIDE		UNF	2/9	2/9	-	3 - 19	5 - 10	NA
STYRENE		UNF	0/9	0/9	-		5 - 10	NA
TETRACHLOROETHENE		UNF	1/9	1/9	-	4 - 4	5 - 10	NA
TOLUENE		UNF	1/9	1/9	-	1 - 1	5 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/9	0/9	-		5 - 10	NA
TRICHLOROETHENE		UNF	2/9	2/9	-	1 - 1	5 - 10	NA
VINYL ACETATE		UNF	0/8	0/8	-		10 - 10	NA
VINYL CHLORIDE		UNF	0/9	0/9	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/9	0/9	-		5 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
2,4,6-TRICHLOROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2,4-DINITROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
2,4-DINITROTOLUENE		UNF	0/9	0/9	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/9	0/9	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/9	0/9	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/9	0/9	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
2-NITROANILINE		UNF	0/9	0/9	-		25 - 50	NA
2-NITROPHENOL		UNF	0/9	0/9	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/9	0/9	-		10 - 20	NA
3-NITROANILINE		UNF	0/9	0/9	-		25 - 50	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/9	0/9	-		25 - 50	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/9	0/9	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/9	0/9	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/9	0/9	-		10 - 10	NA
4-NITROANILINE		UNF	0/9	0/9	-		25 - 50	NA
4-NITROPHENOL		UNF	0/9	0/9	-		25 - 50	NA
ACENAPHTHENE		UNF	0/9	0/9	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/9	0/9	-		10 - 10	NA
ANTHRACENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/9	0/9	-		10 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/9	0/9	-		10 - 10	NA
BENZOIC ACID		UNF	0/7	0/7	-		50 - 50	NA

000121

TABLE E.1-7
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VI

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZYL ALCOHOL		UNF	0/7	0/7	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/9	0/9	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/9	0/9	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/9	0/9	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	1/9	1/9	-	.4 - .4	10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
CARBAZOLE		UNF	0/2	0/2	-		10 - 10	NA
CHRYSENE		UNF	0/9	0/9	-		10 - 10	NA
DI-N-BUTYL PHTHALATE		UNF	1/9	1/9	-	.4 - .4	10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/9	0/9	-		10 - 10	NA
DIBENZOFURAN		UNF	0/9	0/9	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	1/9	1/9	-	.6 - .6	10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/9	0/9	-		10 - 10	NA
FLUORANTHENE		UNF	0/9	0/9	-		10 - 10	NA
FLUORENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/9	0/9	-		10 - 25	NA
HEXACHLOROBUTADIENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/9	0/9	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/9	0/9	-		10 - 10	NA
ISOPHORONE		UNF	0/9	0/9	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/9	0/9	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/9	0/9	-		10 - 10	NA
NAPHTHALENE		UNF	0/9	0/9	-		10 - 10	NA
NITROBENZENE		UNF	0/9	0/9	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/9	0/9	-		10 - 10	NA
PENTACHLOROPHENOL		UNF	0/9	0/9	-		25 - 51	NA
PHENANTHRENE		UNF	0/9	0/9	-		10 - 10	NA
PHENOL		UNF	0/9	0/9	-		10 - 10	NA
PYRENE		UNF	0/9	0/9	-		10 - 10	NA
TRIBUTYL PHOSPHATE		UNF	0/1	0/1	-		10 - 10	NA
4,4'-DDD		UNF	0/7	0/7	-		.1 - .2	NA
4,4'-DDE		UNF	0/7	0/7	-		.1 - .2	NA
4,4'-DDT		UNF	0/7	0/7	-		.1 - .2	NA
ALDRIN		UNF	0/7	0/7	-		.05 - .1	NA
ALPHA-BHC		UNF	0/7	0/7	-		.05 - .1	NA
ALPHA-CHLORDANE		UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1016		UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1221		UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1232		UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1242		UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1248		UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1254		UNF	0/7	0/7	-		1 - 2	NA
AROCLOR-1260		UNF	0/7	0/7	-		1 - 2	NA
BETA-BHC		UNF	0/7	0/7	-		.05 - .1	NA
DELTA-BHC		UNF	0/7	0/7	-		.05 - .1	NA
DIELDRIN		UNF	0/7	0/7	-		.1 - .2	NA
ENDOSULFAN II		UNF	0/7	0/7	-		.1 - .2	NA
ENDOSULFAN SULFATE		UNF	0/7	0/7	-		.1 - .2	NA
ENDOSULFAN-I		UNF	0/7	0/7	-		.05 - .1	NA
ENDRIN		UNF	0/7	0/7	-		.1 - .2	NA
ENDRIN KETONE		UNF	0/7	0/7	-		.1 - .2	NA

000122

TABLE E.1-7

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VI

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
GAMMA-BHC (LINDANE)		UNF	0/7	0/7	-		.05 - .1	NA
GAMMA-CHLORDANE		UNF	0/7	0/7	-		.5 - 1	NA
HEPTACHLOR		UNF	0/7	0/7	-		.05 - .1	NA
HEPTACHLOR EPOXIDE		UNF	0/7	0/7	-		.05 - .1	NA
METHOXYCHLOR		UNF	0/7	0/7	-		.5 - 1	NA
TOXAPHENE		UNF	0/7	0/7	-		1 - 2	NA
AZINPHOSMETHYL		UNF	0/7	0/7	-		2.5 - 2.5	NA
DEMETON		UNF	0/7	0/7	-		2 - 2	NA
DIAZINON		UNF	0/7	0/7	-		1 - 1	NA
DISULFOTON		UNF	0/7	0/7	-		1 - 1	NA
ETHION		UNF	0/7	0/7	-		1 - 1	NA
MALATHION		UNF	0/7	0/7	-		1 - 1	NA
METHYL PARATHION		UNF	0/7	0/7	-		1 - 1	NA
PARATHION		UNF	0/7	0/7	-		1 - 1	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-			NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-			NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		25 - 25	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		25 - 25	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN		UNF	0/1	0/1	-		25 - 25	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		25 - 25	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		10 - 10	NA
2,3,7,8-TETRACHLORODIBENZOFURAN		UNF	0/1	0/1	-		10 - 10	NA
HEPTACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		25 - 25	NA
HEPTACHLORODIBENZOFURANS		UNF	0/1	0/1	-		25 - 25	NA
HEXACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		25 - 25	NA
HEXACHLORODIBENZOFURANS		UNF	0/1	0/1	-			NA
OCTACHLORODIBENZO-P-DIOXIN		UNF	0/1	0/1	-		50 - 50	NA
OCTACHLORODIBENZOFURAN		UNF	0/1	0/1	-		50 - 50	NA
PENTACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		25 - 25	NA
PENTACHLORODIBENZOFURANS		UNF	0/1	0/1	-		25 - 25	NA
TETRACHLORODIBENZO-P-DIOXINS		UNF	0/1	0/1	-		10 - 10	NA
TETRACHLORODIBENZOFURANS		UNF	0/1	0/1	-		10 - 10	NA
ALKALINITY AS CACO3		UNF	4/4	4/4	358	340 - 410		NA
AMMONIA	mg/L	UNF	1/5	0/5	-	.16 - .16	.05 - .1	4.34
CHLORIDE	mg/L	UNF	5/5	0/5	10	3.5 - 35		45
FLUORIDE	mg/L	UNF	5/5	0/5	0.4	.3 - .6		1.3
NITRATE	mg/L	UNF	1/7	0/7	-	.13 - .13	.1 - .1	0.29
NITRATE/NITRITE	mg/L	UNF	1/4	0/4	-	.06 - .06	.05 - .05	0.07
PHENOLS	mg/L	UNF	2/4	0/4	0.002	.002 - .007	.002 - .002	0.03
PHOSPHORUS		UNF	5/5	5/5	1.9	.22 - 7		NA
SULFATE	mg/L	UNF	5/5	0/5	68	18 - 77		136
SULFIDE		UNF	0/3	0/3	-		1 - 1	NA
TOTAL KJELDAHL NITROGEN	mg/L	UNF	2/2	0/2	0.42	.24 - .6		4.34
TOTAL ORGANIC CARBON	mg/L	UNF	4/4	3/4	19.5	5 - 30		9
TOTAL ORGANIC HALIDES	mg/L	UNF	4/4	1/4	0.03	.03 - .45		0.126
TOTAL ORGANIC NITROGEN	mg/L	UNF	2/2	1/2	0.34	.24 - .44		0.34

000123

TABLE E.1-7
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VI

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

6161

000124

TABLE E.1-8
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VII

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/3	3/3	2.7	.416 - 11.8		ND
URANIUM-238	pCi/L	UNF	6/6	6/6	3.5	1.8 - 11.81		0.8
URANIUM, TOTAL	ug/L	FIL	2/3	2/3	8.3	8.3 - 39.6	1 - 1	1.4
URANIUM, TOTAL	ug/L	UNF	6/6	5/6	7.7	1 - 30.4		1.3
URANIUM-234	pCi/L	FIL	3/3	2/3	2.4	.391 - 12		0.6
URANIUM-234	pCi/L	UNF	6/6	6/6	3.3	1.4 - 11.02		0.9
THORIUM-230	pCi/L	FIL	2/3	2/3	0.25	.251 - .4	.41 - .41	ND
THORIUM-230	pCi/L	UNF	4/6	3/6	1.33	1.29 - 3.04	.2 - .308	1.3
RADIUM-226	pCi/L	FIL	0/3	0/3	-		1 - 1	0.9
RADIUM-226	pCi/L	UNF	1/6	1/6	-	1.21 - 1.21	1 - 1	0.9
URANIUM-235/236	pCi/L	FIL	1/3	1/3	-	.6 - .6	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	2/6	2/6	-	.212 - .7	.2 - 1	ND
THORIUM-232	pCi/L	FIL	0/3	0/3	-		.2 - 1.03	ND
THORIUM-232	pCi/L	UNF	3/6	3/6	0.6	.7423 - 2.6	.2 - 1	0.34
THORIUM, TOTAL	ug/L	FIL	0/2	0/2	-		.5 - 9.48	ND
THORIUM, TOTAL	ug/L	UNF	4/6	4/6	6.9	6.83 - 23.9	1.55 - 4	3.1
RADIUM-228	pCi/L	FIL	0/3	0/3	-		3 - 3	2.2
RADIUM-228	pCi/L	UNF	1/6	1/6	-	3.68 - 3.68	3 - 3	3
THORIUM-228	pCi/L	FIL	0/3	0/3	-		.2 - 1.03	0.1
THORIUM-228	pCi/L	UNF	3/6	1/6	0.6	.78 - 2.37	.24 - 1	1.5
NEPTUNIUM-237	pCi/L	FIL	0/2	0/2	-		.5 - .5	not tested
NEPTUNIUM-237	pCi/L	UNF	0/6	0/6	-		.5 - 1	0.25
PLUTONIUM-239/240	pCi/L	FIL	0/2	0/2	-		.5 - .5	ND
PLUTONIUM-239/240	pCi/L	UNF	0/6	0/6	-		.5 - 1	ND
PLUTONIUM-238	pCi/L	FIL	0/2	0/2	-		.5 - .5	not tested
PLUTONIUM-238	pCi/L	UNF	0/6	0/6	-		.5 - 1	0.075
STRONTIUM-90	pCi/L	FIL	0/2	0/2	-		1 - 1	not tested
STRONTIUM-90	pCi/L	UNF	1/6	1/6	-	3.45 - 3.45	1 - 5	2
TECHNETIUM-99	pCi/L	FIL	0/3	0/3	-		15 - 15.1	30
TECHNETIUM-99	pCi/L	UNF	0/6	0/6	-		15 - 30	30
RUTHENIUM-106	pCi/L	FIL	0/2	0/2	-		150 - 153	not tested
RUTHENIUM-106	pCi/L	UNF	0/6	0/6	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/2	0/2	-		15.9 - 16	not tested
CESIUM-137	pCi/L	UNF	0/6	0/6	-		8.7 - 18.7	ND
GROSS ALPHA		FIL	1/2	1/2	-	7.6 - 7.6	13.5 - 13.5	NA
GROSS ALPHA		UNF	2/6	2/6	-	27.12 - 42.8	10.2 - 30.3	NA
GROSS BETA		FIL	1/2	1/2	-	14.1 - 14.1	10.2 - 10.2	NA
GROSS BETA		UNF	3/6	3/6	13.3	15.3 - 31.6	8.53 - 22.8	NA
URANIUM-235		UNF	1/1	1/1	-	.015 - .015		NA
URANIUM-236		UNF	1/1	1/1	-	.002 - .002		NA
ALUMINUM	mg/L	FIL	0/3	0/3	-		.0711 - .252	0.123
ALUMINUM	mg/L	UNF	4/6	4/6	10.9	8.6 - 49.8	.0293 - .0454	2.29
ANTIMONY	mg/L	FIL	0/3	0/3	-		.0037 - .045	0.0272
ANTIMONY	mg/L	UNF	0/6	0/6	-		.0014 - .0587	ND
ARSENIC	mg/L	FIL	0/3	0/3	-		.001 - .002	0.122
ARSENIC	mg/L	UNF	3/6	0/6	0.002	.0038 - .0054	.001 - .002	0.0194
BARIUM	mg/L	FIL	3/3	0/3	0.097	.0781 - .126		0.451
BARIUM	mg/L	UNF	6/6	6/6	0.135	.0829 - .217		0.0454
BERYLLIUM	mg/L	FIL	0/3	0/3	-		.001 - .0028	0.0018
BERYLLIUM	mg/L	UNF	1/6	1/6	-	.0019 - .0019	.001 - .002	ND
CADMIUM	mg/L	FIL	0/3	0/3	-		.002 - .005	0.006
CADMIUM	mg/L	UNF	0/6	0/6	-		.002 - .0031	ND
CALCIUM	mg/L	FIL	3/3	1/3	127	118 - 138		131

000125

TABLE E.1-8
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VII

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	UNF	6/6	3/6	226	120 - 781		172
CHROMIUM	mg/L	FIL	0/3	0/3	-		.004 - .01	0.034
CHROMIUM	mg/L	UNF	4/6	4/6	0.009	.0054 - .0323	.004 - .004	0.0046
COBALT	mg/L	FIL	0/3	0/3	-		.003 - .01	ND
COBALT	mg/L	UNF	1/6	1/6	-	.0094 - .0094	.003 - .0163	ND
COPPER	mg/L	FIL	0/3	0/3	-		.002 - .01	0.019
COPPER	mg/L	UNF	1/6	1/6	-	.328 - .328	.002 - .0201	0.0294
CYANIDE	mg/L	FIL	0/3	0/3	-		.01 - .02	ND
CYANIDE	mg/L	UNF	0/6	0/6	-		.001 - .01	ND
IRON	mg/L	FIL	1/3	0/3	-	.509 - .509	.02 - .0316	3058
IRON	mg/L	UNF	5/6	4/6	20.6	.608 - 94.8	1.55 - 1.55	6.35
LEAD	mg/L	FIL	0/3	0/3	-		.001 - .002	0.0087
LEAD	mg/L	UNF	3/6	3/6	0.006	.0105 - .017	.001 - .002	0.0016
MAGNESIUM	mg/L	FIL	3/3	2/3	55.5	44.9 - 56.6		47.8
MAGNESIUM	mg/L	UNF	6/6	5/6	84.6	44.5 - 325		50.7
MANGANESE	mg/L	FIL	3/3	1/3	0.17	.0319 - .418		0.18
MANGANESE	mg/L	UNF	6/6	4/6	0.57	.099 - 1.29		0.205
MERCURY	mg/L	FIL	0/3	0/3	-		.0002 - .0002	ND
MERCURY	mg/L	UNF	0/6	0/6	-		.0001 - .0002	ND
MOLYBDENUM	mg/L	FIL	1/3	0/3	-	.0051 - .0051	.007 - .02	0.017
MOLYBDENUM	mg/L	UNF	2/6	2/6	-	.0062 - .0142	.0061 - .025	ND
NICKEL	mg/L	FIL	2/3	0/3	-	.0037 - .0118	.02 - .02	0.022
NICKEL	mg/L	UNF	3/6	3/6	0.019	.029 - .042	.003 - .019	0.0072
POTASSIUM	mg/L	FIL	1/3	0/3	-	.753 - .753	.434 - .654	29.3
POTASSIUM	mg/L	UNF	6/6	0/6	3.38	.773 - 12		17.2
SELENIUM	mg/L	FIL	0/3	0/3	-		.001 - .002	ND
SELENIUM	mg/L	UNF	0/6	0/6	-		.001 - .002	ND
SILICON	mg/L	FIL	3/3	0/3	5.37	5.28 - 5.68		7.43
SILICON	mg/L	UNF	4/4	4/4	28.7	17.9 - 71.3		10.7
SILVER	mg/L	FIL	0/3	0/3	-		.002 - .01	0.04
SILVER	mg/L	UNF	0/6	0/6	-		.002 - .01	0.0031
SODIUM	mg/L	FIL	3/3	1/3	29.8	20.8 - 157		38.3
SODIUM	mg/L	UNF	6/6	3/6	41	13.6 - 156		50
THALLIUM	mg/L	FIL	0/3	0/3	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/6	0/6	-		.001 - .01	ND
VANADIUM	mg/L	FIL	0/3	0/3	-		.0081 - .0118	0.0195
VANADIUM	mg/L	UNF	3/6	3/6	0.016	.0274 - .0376	.004 - .008	0.0051
ZINC	mg/L	FIL	1/3	0/3	-	.0035 - .0035	.0021 - .005	0.0443
ZINC	mg/L	UNF	4/6	0/6	0.065	.0642 - .284	.006 - .011	0.352
1,1,1,2-TETRACHLOROETHANE		UNF	0/1	0/1	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
1,1-DICHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
1,1-DICHLOROETHENE		UNF	0/6	0/6	-		10 - 10	NA
1,2-DICHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/6	0/6	-		10 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/6	0/6	-		10 - 10	NA
2-BUTANONE		UNF	0/6	0/6	-		10 - 10	NA
2-HEXANONE		UNF	0/6	0/6	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/6	0/6	-		10 - 10	NA
ACETONE		UNF	0/6	0/6	-		10 - 10	NA
BENZENE		UNF	0/6	0/6	-		10 - 10	NA

000126

TABLE E.1-8

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VII

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BROMODICHLOROMETHANE		UNF	0/6	0/6	-		10 - 10	NA
BROMOFORM		UNF	0/6	0/6	-		10 - 10	NA
BROMOMETHANE		UNF	0/6	0/6	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/6	0/6	-		10 - 10	NA
CARBON TETRACHLORIDE		UNF	0/6	0/6	-		10 - 10	NA
CHLOROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
CHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
CHLOROFORM		UNF	0/6	0/6	-		10 - 10	NA
CHLOROMETHANE		UNF	0/6	0/6	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/6	0/6	-		10 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/6	0/6	-		10 - 10	NA
ETHYLBENZENE		UNF	0/6	0/6	-		10 - 10	NA
METHYLENE CHLORIDE		UNF	0/6	0/6	-		10 - 10	NA
STYRENE		UNF	0/6	0/6	-		10 - 10	NA
TETRACHLOROETHENE		UNF	0/6	0/6	-		10 - 10	NA
TOLUENE		UNF	0/6	0/6	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/6	0/6	-		10 - 10	NA
TRICHLOROETHENE		UNF	0/6	0/6	-		10 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/1	0/1	-		1 - 1	NA
VINYL ACETATE		UNF	0/4	0/4	-		10 - 10	NA
VINYL CHLORIDE		UNF	0/6	0/6	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/6	0/6	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/6	0/6	-		25 - 25	NA
2,4,6-TRICHLOROPHENOL		UNF	0/6	0/6	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/6	0/6	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/6	0/6	-		10 - 10	NA
2,4-DINITROPHENOL		UNF	0/6	0/6	-		25 - 25	NA
2,4-DINITROTOLUENE		UNF	0/6	0/6	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/6	0/6	-		10 - 10	NA
2-BENZYL-4-CHLOROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/3	0/3	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/6	0/6	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/6	0/6	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/6	0/6	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/6	0/6	-		10 - 10	NA
2-NITROANILINE		UNF	0/6	0/6	-		25 - 25	NA
2-NITROPHENOL		UNF	0/6	0/6	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/6	0/6	-		10 - 10	NA
3-NITROANILINE		UNF	0/6	0/6	-		25 - 25	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/6	0/6	-		25 - 25	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/6	0/6	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/6	0/6	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/6	0/6	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/6	0/6	-		10 - 10	NA
4-NITROANILINE		UNF	0/6	0/6	-		25 - 25	NA
4-NITROPHENOL		UNF	0/6	0/6	-		25 - 25	NA
ACENAPHTHENE		UNF	0/6	0/6	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/6	0/6	-		10 - 10	NA
ANTHRACENE		UNF	0/6	0/6	-		10 - 10	NA

000127

TABLE E.1-8
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VII

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(A)ANTHRACENE		UNF	0/6	0/6	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/6	0/6	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/6	0/6	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/6	0/6	-		10 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/6	0/6	-		10 - 10	NA
BENZOIC ACID		UNF	0/6	0/6	-		50 - 50	NA
BENZYL ALCOHOL		UNF	0/6	0/6	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/6	0/6	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/6	0/6	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/6	0/6	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	2/6	2/6	-	1 - 2	10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/6	0/6	-		10 - 10	NA
CARBAZOLE		UNF	0/6	0/6	-		10 - 10	NA
CHRYSENE		UNF	0/6	0/6	-		10 - 10	NA
CUMENE		UNF	0/1	0/1	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	0/6	0/6	-		10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/6	0/6	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/6	0/6	-		10 - 10	NA
DIBENZOFURAN		UNF	0/6	0/6	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	0/6	0/6	-		10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/6	0/6	-		10 - 10	NA
FLUORANTHENE		UNF	0/6	0/6	-		10 - 10	NA
FLUORENE		UNF	0/6	0/6	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/6	0/6	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/6	0/6	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/6	0/6	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/6	0/6	-		10 - 10	NA
ISOPHORONE		UNF	0/6	0/6	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/6	0/6	-		10 - 10	NA
N-NITROSODIMETHYLAMINE		UNF	0/2	0/2	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/6	0/6	-		10 - 10	NA
NAPHTHALENE		UNF	0/6	0/6	-		10 - 10	NA
NITROBENZENE		UNF	0/6	0/6	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/6	0/6	-		25 - 25	NA
PENTACHLOROPHENOL		UNF	0/6	0/6	-		10 - 10	NA
PHENANTHRENE		UNF	0/6	0/6	-		10 - 10	NA
PHENOL		UNF	0/6	0/6	-		10 - 10	NA
PYRENE		UNF	0/2	0/2	-		10 - 10	NA
TRIBUTYL PHOSPHATE		UNF	0/6	0/6	-		.1 - .1	NA
4,4'-DDD		UNF	0/6	0/6	-		.1 - .1	NA
4,4'-DDE		UNF	0/6	0/6	-		.1 - .1	NA
4,4'-DDT		UNF	0/6	0/6	-		.05 - .05	NA
ALDRIN		UNF	0/6	0/6	-		.05 - .05	NA
ALPHA-BHC		UNF	0/6	0/6	-		.05 - .05	NA
ALPHA-CHLORDANE		UNF	0/6	0/6	-		1 - 1	NA
AROCLOR-1016		UNF	0/6	0/6	-		2 - 2	NA
AROCLOR-1221		UNF	0/6	0/6	-		1 - 1	NA
AROCLOR-1232		UNF	0/6	0/6	-		1 - 1	NA
AROCLOR-1242		UNF	0/6	0/6	-		1 - 1	NA
AROCLOR-1248		UNF	0/6	0/6	-		1 - 1	NA
AROCLOR-1254		UNF	0/6	0/6	-		1 - 1	NA
AROCLOR-1260		UNF	0/6	0/6	-		1 - 1	NA

000128

TABLE E.1-8

SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VII

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BETA-BHC		UNF	0/6	0/6	-		.05 - .05	NA
DELTA-BHC		UNF	0/6	0/6	-		.05 - .05	NA
DIELDRIN		UNF	0/6	0/6	-		.1 - .1	NA
ENDOSULFAN II		UNF	0/6	0/6	-		.1 - .1	NA
ENDOSULFAN SULFATE		UNF	0/6	0/6	-		.1 - .1	NA
ENDOSULFAN-I		UNF	0/6	0/6	-		.05 - .05	NA
ENDRIN		UNF	0/6	0/6	-		.1 - .1	NA
ENDRIN ALDEHYDE		UNF	0/6	0/6	-		.1 - .1	NA
ENDRIN KETONE		UNF	0/6	0/6	-		.1 - .1	NA
GAMMA-BHC (LINDANE)		UNF	0/6	0/6	-		.05 - .05	NA
GAMMA-CHLORDANE		UNF	0/6	0/6	-		.05 - .05	NA
HEPTACHLOR		UNF	0/6	0/6	-		.05 - .05	NA
HEPTACHLOR EPOXIDE		UNF	0/6	0/6	-		.05 - .05	NA
METHOXYCHLOR		UNF	0/6	0/6	-		.5 - .5	NA
TOXAPHENE		UNF	0/6	0/6	-		5 - 5	NA
ALKALINITY AS CACO3		UNF	6/6	6/6	356	250 - 450		NA
ALLYL CHLORIDE		UNF	0/1	0/1	-		5 - 5	NA
AMMONIA	mg/L	UNF	2/6	0/6	-	.14 - .15	.1 - .1	4.34
BICARBONATE ALKALINITY		UNF	2/2	2/2	385	320 - 450		NA
CARBONATE ALKALINITY		UNF	0/2	0/2	-		3 - 30	NA
CHLORIDE	mg/L	UNF	6/6	5/6	134	44.07 - 573.8		45
FLUORIDE	mg/L	UNF	6/6	0/6	0.285	.2 - .5		1.3
NITRATE	mg/L	UNF	0/6	0/6	-		.02 - .02	0.29
NITRATE, AS NITROGEN		UNF	2/3	2/3	0.02	.02 - .08	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	0/3	0/3	-		.02 - .03	0.07
NITRITE, AS NITROGEN		UNF	0/1	0/1	-		.02 - .02	NA
PH		UNF	3/3	3/3	7.8	6.97 - 7.9		NA
PHENOLS	mg/L	UNF	0/6	0/6	-		.01 - .01	0.03
PHOSPHORUS		UNF	5/6	5/6	0.46	.06 - 4.13	.02 - .02	NA
SPECIFIC CONDUCTIVITY		UNF	3/3	3/3	1360	1100 - 1600		NA
SULFATE	mg/L	UNF	6/6	2/6	100.6	57.4 - 147.5		136
SULFIDE		UNF	1/6	1/6	-	1.35 - 1.35	.5 - .5	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	3/3	3/3	664	536 - 732		452
TOTAL KJELDAHL NITROGEN	mg/L	UNF	5/6	0/6	0.24	.13 - .5	.1 - .1	4.34
TOTAL ORGANIC CARBON	mg/L	UNF	6/6	0/6	1.31	1.04 - 1.65		9
TOTAL ORGANIC HALIDES	mg/L	UNF	5/6	0/6	0.029	.0179 - .0668	.01 - .01	0.126
TOTAL ORGANIC HALOGENS		UNF	2/3	2/3	0.021	.021 - .023	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	5/6	2/6	0.165	.13 - 1.2	.1 - .1	0.34
TOTAL SOLIDS		UNF	2/2	2/2	795	690 - 900		NA
1,2,3-TRICHLOROPROPANE		UNF	0/1	0/1	-		5 - 5	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/1	0/1	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/1	0/1	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/1	0/1	-		5 - 5	NA
ACROLEIN		UNF	0/1	0/1	-		50 - 50	NA
ACROLEIN		UNF	0/1	0/1	-		50 - 50	NA
ACRYLONITRILE		UNF	0/1	0/1	-		50 - 50	NA
DICHLORODIFLUOROMETHANE		UNF	0/1	0/1	-		10 - 10	NA
ETHYL CYANIDE		UNF	0/1	0/1	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/1	0/1	-		5 - 5	NA
IODOMETHANE		UNF	0/1	0/1	-		5 - 5	NA
METHACRYLONITRILE		UNF	0/1	0/1	-		5 - 5	NA
METHYL METHACRYLATE		UNF	0/1	0/1	-		5 - 5	NA
PENTACHLOROETHANE		UNF	0/1	0/1	-		5 - 5	NA

000129

TABLE E.1-8
SUMMARY STATISTICS FOR FEMP TYPE 1 WELLS IN PERCHED GROUNDWATER CONTAMINATION AREA VII

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
TRANS-1,2-DICHLOROETHENE		UNF	0/3	0/3	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/1	0/1	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

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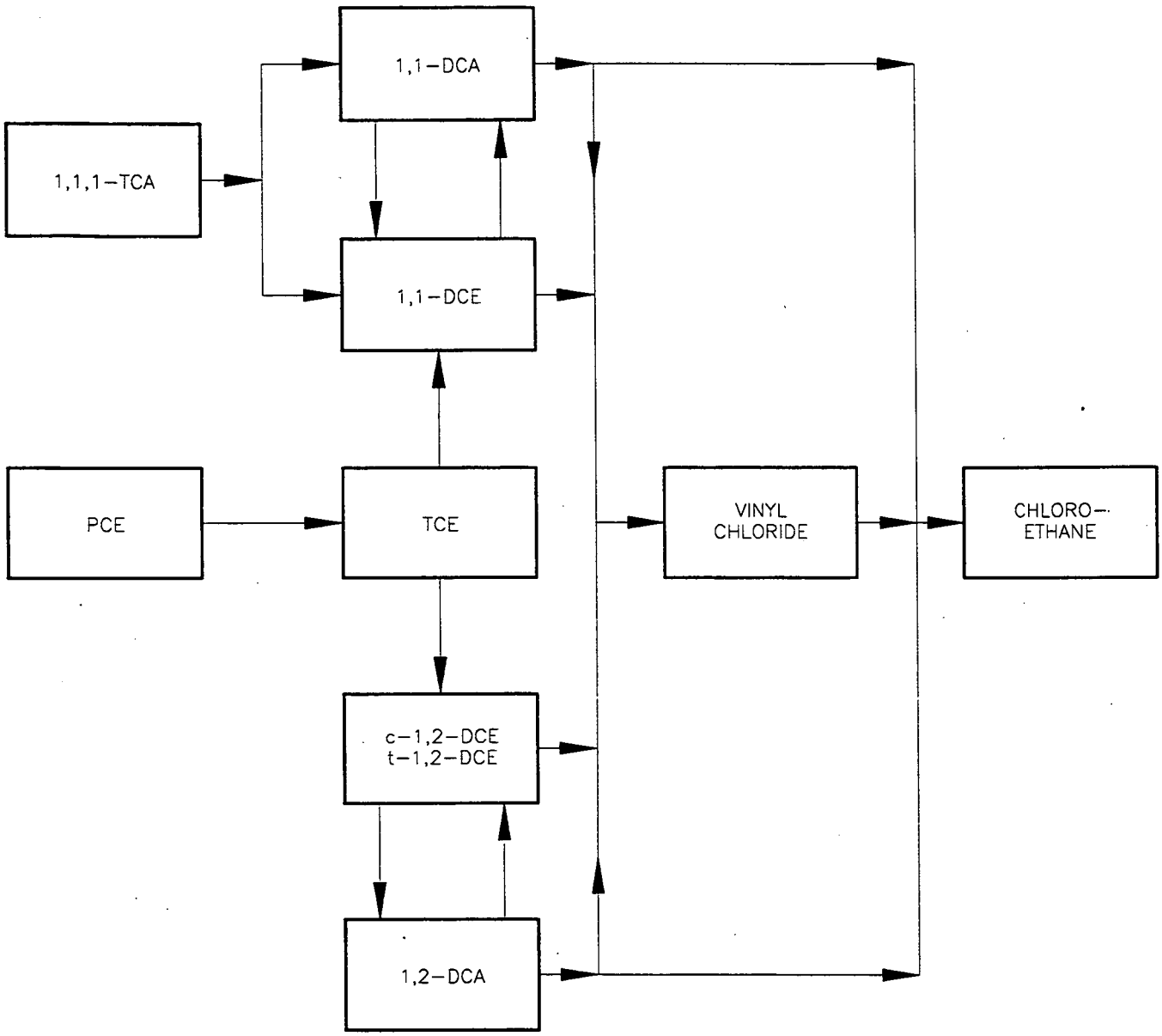

LEGEND:

PCE:	TETRACHLOROETHENE
TCE:	TRICHLOROETHENE
1,1-TCA:	1,1,1-TRICHLOROETHANE
1,1-DCA:	1,1-DICHLOROETHANE
1,1-DCE:	1,1-DICHLOROETHENE
c-1,2-DCE:	CIS-1,2-DICHLOROETHENE
t-1,2-DCE:	TRANS-1,2-DICHLOROETHENE
1,2-DCA:	1,2-DICHLOROETHANE

NOTES:

SOURCE: DRAGUN, J, 1988, THE SOIL CHEMISTRY OF HAZARDOUS MATERIALS, HAZARDOUS MATERIALS CONTROL RESEARCH INSTITUTE, SILVER SPRING, MARYLAND.

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FIGURE E.1-1. TRANSFORMATION PATHWAYS FOR VARIOUS CHLORINATED VOLATILE HYDROCARBONS IN SOIL SYSTEMS

E-2 Great Miami Aquifer

E.2.0 GREAT MIAMI AQUIFER

E.2.1 RADIOLOGICAL PARAMETERS

E.2.1.1 Uranium isotopes

Plates E-77 through E-78, E-85 through E-86, E-87 through E-88, and E-89 through E-90 are isoconcentration maps of uranium (total uranium, uranium-238, -234, and -235/236, respectively) in Type 2 and Type 3, and Type 4 wells. The maps are based on results from unfiltered samples from the 1993 data set. In natural uranium, uranium-238 accounts for about 99.3 weight percent of the total uranium. In depleted uranium, the uranium-238 concentration is even greater. In natural uranium, the uranium-234 activity is approximately equal to that of the uranium-238. Because most of the material processed at the FEMP contained either natural or depleted uranium, the isoconcentration maps for uranium-238 and -234 should be relatively consistent with that of total uranium. A comparison of the isoconcentration maps for uranium-238, -234, and total uranium shows this to be true. For a discussion of total uranium, see Section 4.8.1.

In natural uranium, uranium-235 has an activity approximately 1/20 that of uranium-238. This lower activity concentration makes the uranium-235 more difficult to detect and quantify. A comparison of the isoconcentration of uranium-235 with those of uranium-238 or total uranium shows that the uranium-235 isoconcentration map still identifies the areas of peak contaminant concentrations near the sources; however, due to its lower relative concentration, the areal extent of the uranium-235 appears to be smaller. Because the uranium-235 cannot be separated from the uranium-238 via chemical means, the presence of uranium-238 in groundwater infers the presence of uranium-235, even if the uranium-235 concentration is too low to quantify by analytical means.

Thorium-230

Thorium-230 (Th-230) behaves chemically like thorium-232 and -228, but it is otherwise unrelated to these isotopes. Thorium-230 is a progeny of uranium-238 and, as such, can be found at the FEMP as a constituent in raffinate that remains after the extraction of uranium from pitchblende ores and uranium concentrates.

Thorium-230 in unfiltered samples has a 95th percentile background value of 0.89 pCi/L and background values that range from 0.18 to 2.5 pCi/L (Table E.0-2). Thorium-230 in filtered samples

has a 95th percentile background value of 0.29 pCi/L and background values that range from 0.1 to 0.29 pCi/L (Table E.0-2).

Plate E-91 is an isoconcentration map of thorium-230 concentrations in unfiltered groundwater samples from Type 2 wells. Thorium-230 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 10 of 158 wells (6 percent) and had a maximum concentration of 2.85 pCi/L (Table E.2-1). These concentrations are comparable to the maximum background value of 2.5 pCi/L. Thorium-230 was detected in unfiltered samples from Type 3 and Type 4 wells at above-background concentrations less frequently than from Type 2 wells (Tables E.2-2 and E.2-3). Thorium-230 was detected at a higher maximum concentration in the Type 2 than in the Type 3 and 4 wells. As is typical of most radiological and inorganic parameters at the FEMP, thorium-230 was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of thorium-230 greater than two times background were detected in unfiltered samples from isolated Type 2 wells in a few areas. Thorium-230 was detected in Well 2429 (2.8 pCi/L) in the Plant 6 plume and in Well 2943 (2.1 pCi/L) in South Plume A. Thorium-230 was also detected in Well 2395 (2.9 pCi/L) east of the Paddys Run Road Site (PRRS) plume and South Plume B. This sample is an estimated value and may not represent contamination. These concentrations are comparable to the maximum background value of 2.5 pCi/L. Thorium-230 was not detected at activity concentrations greater than two times background in Type 3 and Type 4 unfiltered samples.

There were five isolated detections of thorium-230 greater than three times background in filtered samples from Type 2 wells. Thorium-230 was detected in filtered samples in Well 21033 (1.6 pCi/L) in South Plume A. Thorium-230 was also detected in South Plume C in Well 2556 (3.1 pCi/L) and in Well 2395 (2.2 pCi/L) east of the Paddys Run Road Site (PRRS) plume and South Plume B. Two wells in the PRRS plume also had elevated thorium-230 concentrations (Well 2553 and Well 2129, 2.0 and 1.3 pCi/L, respectively).

Three isolated wells had thorium-230 concentrations greater than three times background in filtered samples from Type 3 and Type 4 wells. Thorium-230 was detected in Well 3678 (2.0 pCi/L) in the waste storage area A plume, Well 3094 (1.5 pCi/L) in South Plume C, and Well 3126 (2.5 pCi/L) in the PRRS plume.

Elevated concentrations of thorium-230 in unfiltered and filtered samples were detected in Type 2 and Type 3 wells; however, these were isolated detections and many were comparable to the maximum background concentrations. Considering the low solubility of thorium (see Section 4.8.1) and the relatively few isolated detections above background, thorium-230 is not considered a major contaminant at the FEMP.

Radium-226

Radium-226 (Ra-226) behaves chemically like radium-228 but is otherwise unrelated to it. Radium-226 is a progeny of uranium-238 and is found at the FEMP as a constituent in raffinate that remains after the extraction of uranium. Radium-226 also occurs naturally in the Great Miami Aquifer.

Radium-226 in unfiltered samples has a 95th percentile background value of 1.5 pCi/L and background values that range from 0.071 to 2.0 pCi/L. Radium-226 in filtered samples has a 95th percentile background value of 1.9 pCi/L and background values that range from 0.20 to 2.0 pCi/L (Table E.0-2).

Plate E-92 is an isoconcentration map of radium-226 concentrations in unfiltered groundwater samples from Type 2 wells. Radium-226 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 12 of 158 wells (8 percent) and had a maximum concentration of 14.9 pCi/L (Table E.2-1). Radium-226 was detected in unfiltered samples from Type 3 and Type 4 wells at above-background concentrations less frequently than Type 2 wells (Tables E.2-2 and E.2-3). Radium-226 was detected at a higher maximum concentration in the Type 2 wells than in the Types 3 and 4 wells. As is typical of most radiological and inorganic parameters at the FEMP, radium-226 was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of radium-226 greater than three times background were detected in unfiltered samples from two isolated Type 2 wells; in Well 2108 (12.3 pCi/L) in the waste storage area B plume and Well 2390 (14.9 pCi/L) in South Plume B. In the unfiltered samples, radium-226 was detected at concentrations greater than three times background in Well 3107 (7.5 pCi/L) located in the waste storage area B plume.

There was only one isolated detection of radium-226 that was greater than two times background in filtered samples from Type 2 wells. Well 2648 located in the waste storage area A plume had an activity concentration value of 4.1 pCi/L. Radium-226 was not detected above two times background in filtered samples from Type 3 and Type 4 wells.

Elevated concentrations of radium-226 in unfiltered and filtered groundwater samples were detected in Type 2, Type 3, and Type 4 wells; however, there were few isolated detections which were greater than three times background. Radium-226 is not considered a major contaminant at the FEMP.

E.2.1.2 Thorium Decay Series

Total Thorium

Isoconcentration maps of total thorium concentrations in unfiltered and filtered groundwater samples from Type 2 wells are presented in Plates E-94 and E-96. Plates E-95 and E-97 are isoconcentration maps of total thorium in unfiltered and filtered samples, respectively from Type 3 and Type 4 wells.

Total thorium is a measurement of the quantity of thorium in a sample without distinguishing between thorium's three principal isotopes, thorium-232, -230, and -228. Thorium-230 and -228 have very high activities (rates of radioactive decay) relative to thorium-232. Total thorium is largely a measurement of thorium-232 (Plate E-93), because thorium-230 and -228 are only a small weight fraction of total thorium anywhere at the FEMP. Discrepancies between the total thorium maps (Plates E-94, E-95, E-96, and E-97) and the thorium-232 map (Plate E-93) result from differences in the detection limits for each analysis and differences in the number of wells sampled for each analysis.

Thorium-232

Thorium-232 (Th-232) occurs naturally in the environment and also entered the site as material to be processed, but it is not a decay product of either the uranium-238 or actinium decay series.

Thorium-232 in unfiltered samples has a 95th percentile background value of 0.23 pCi/L, and background values that range from 0.1 to 0.77 pCi/L. Thorium-232 in filtered samples has a 95th percentile background value of 0.3 pCi/L and background values that range from 0.1 to 0.3 pCi/L (Table E.0-2).

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Plate E-93 is a contour map of thorium-232 activity concentrations in unfiltered groundwater samples from Type 2 wells. Thorium-232 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 13 of 158 wells (8 percent) and had a maximum concentration of 2.7 pCi/L (Table E.2-1). Thorium-232 was detected in unfiltered samples from Types 3 and 4 wells at above-background concentrations less frequently than Type 2 wells (Table E.2-2 and E.2-3). Thorium-232 was detected at a higher maximum concentration in the Type 2 wells than in the Types 3 and 4 wells. As is typical of most radiological and inorganic parameters at the FEMP, thorium-232 was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of thorium-232 greater than 1 pCi/L were detected in unfiltered samples from isolated Type 2 wells in a few areas. thorium-232 was detected in Well 2024 (1.2 pCi/L) in the waste storage area A plume; Well 2045 (1.1 pCi/L) in South Plume A; Wells 2065 and 2551 (1.8 and 2.7 pCi/L, respectively) in South Plume B; and Well 2558 (1.3 pCi/L) in South Plume C. Wells 2091 and 2395 (1.2 and 1.6 pCi/L, respectively) also had elevated concentrations of thorium-232 greater than 1 pCi/L. These wells are not associated with a known contaminant plume and may be attributable to natural background variability. Thorium-232 was also detected in Well 4091 (2.4 pCi/L) at elevated concentrations.

There were three isolated detections of thorium-232 greater than 1 pCi/L in filtered samples from Type 2 wells. Thorium-232 was detected in filtered samples from Well 2024 (1.2 pCi/L) in the waste storage area A plume; Well 2551 (2.7 pCi/L) in South Plume B; and Well 2558 (1.3 pCi/L) in South Plume C. Thorium-232 was detected in Type 4 wells at concentrations greater than 1 pCi/L in Well 4102 (1.2 pCi/L) in the waste storage area B plume and in Well 4091 (2.4 pCi/L), which is not associated with a known contaminant plume.

Elevated concentrations of thorium-232 in unfiltered and filtered samples were detected in Type 2 and Type 4 wells; however, detections were isolated and only a few were greater than 1.0 pCi/L. Detections less than 1.0 pCi/L are near the detection limit, have a high uncertainty, and may be representative of the natural variability in background concentrations. Considering the low solubility of thorium (see Section 4.8.1) and the relatively few isolated detections, thorium-232 is not considered a major contaminant at the FEMP.

Radium-228

Radium-228 (Ra-228) behaves chemically like radium-226 but is otherwise unrelated to it. Radium-228 is a progeny of thorium-232 and as such can be found at the FEMP as a constituent in raffinate that remains after the extraction of thorium-232 or as an ingrowth from thorium-232. Radium-228 occurs naturally in the Great Miami Aquifer.

Radium-228 in unfiltered samples has a 95th percentile background value of 3.6 pCi/L and background values that range from 1.0 to 52 pCi/L (Table E.0-2). Radium-228 was not detected in filtered background samples; consequently, any detection of radium-228 is considered an above-background detection.

Plate E-98 is a contour map of radium-228 activity concentrations in unfiltered groundwater samples from Type 2 wells. Radium-228 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 8 of 158 wells (5 percent) and had a maximum concentration of 5.3 pCi/L (Table E.2-1). Radium-228 was detected in unfiltered samples from Types 3 wells at above-background concentrations more frequently than Type 2 wells (Table E.2-2 and E.2-3). However, radium-228 was detected at a higher maximum concentration in the Type 2 wells than in the Type 3. Radium-228 was not detected above-background in the Type 4 wells. As is typical of most radiological and inorganic parameters at the FEMP, radium-228 was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of radium-228 greater than two times background were not detected in unfiltered samples from Type 2 wells. Radium-228 was detected at concentrations greater than 5 pCi/L in unfiltered samples in Well 3094 (7.1 pCi/L) in South Plume C. Radium-228 was not detected in elevated concentrations in other unfiltered samples from Type 3 wells.

There was one isolated detection of radium-228 at an elevated concentration in filtered samples from Type 2 wells. Radium-228 was detected in Well 2393 (5.0 pCi/L in the PRRS plume). Radium-228 was not detected in elevated concentrations in filtered samples from Type 3 and Type 4 wells.

Elevated concentrations of radium-228 were detected in filtered samples from Type 2 wells and unfiltered samples from Type 3 wells; however, these were isolated detections and radium-228 is not considered a major contaminant at the FEMP.

Thorium-228

Thorium-228 (thorium-228) is a progeny of thorium-232 and as such can be found at the FEMP as a constituent in raffinate that remains after the extraction of thorium-232. Thorium-228 occurs naturally in the Great Miami Aquifer.

Thorium-228 in unfiltered samples has a 95th percentile background value of 0.77 pCi/L and background values that range from 0.075 to 2.9 pCi/L; thorium-228 in filtered samples was determined to have a 95th percentile background value of 0.4 pCi/L and background values that range from 0.2 to 0.4 pCi/L (Table E.0-2).

Plate E-99 is a contour map of thorium-228 activity concentrations in unfiltered groundwater samples from Type 2 wells. Thorium-228 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 10 of 158 wells (6 percent) and had a maximum concentration of 1.97 pCi/L (Table E.2-1). This is lower than the maximum background value of 2.9 pCi/L. Thorium-228 was detected in unfiltered samples from Types 3 wells at above-background concentrations less frequently than Type 2 wells (Table E.2-2 and E.2-3). Thorium-228 was not detected above background in Type 4 wells. Thorium-228 was detected at a higher maximum concentration in the Type 3 wells than in the Type 2 wells. As is typical of most radiological and inorganic parameters at the FEMP, thorium-228 was generally detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of thorium-228 greater than two times background were detected in unfiltered samples from isolated Type 2 wells in a few areas. Thorium-228 was detected in Well 2033 (1.7 pCi/L) in the waste storage area B plume and in Well 2065 (1.7 pCi/L) in South Plume B. Thorium-228 was also detected in Wells 2554, 2556, and 2561 (1.7, 1.9, and 2.0 pCi/L, respectively) in South Plume C. Two isolated detections of thorium-228 greater than two times background occurred in Well 2555 (1.7 pCi/L) and Well 2395 (1.7 pCi/L); however, these wells are not associated with a known contaminant plume and therefore may be attributable to natural background variability. These concentrations are all lower than the maximum background value of 2.9 pCi/L. Elevated concentrations of thorium-228 were not detected in the unfiltered samples from Type 3 wells.

There were several isolated detections of thorium-228 greater than twice background in filtered samples from Type 2 wells. Thorium-228 was detected in Well 2553 (1.8 pCi/L) in South Plume B, in Wells 2554, 2556, and 2561 (1.6, 2.1, and 1.7 pCi/L, respectively), in South Plume C, and in Well 2129 (2.6 pCi/L) in the PRRS plume. Additionally, thorium-228 was detected in Well 2555 (2.0 pCi/L); however, this well is not associated with a known contaminant plume and thus may be attributable to natural background variability.

Thorium-228 was detected in four wells at concentrations greater than 1 pCi/L in filtered samples from Type 3 wells: Well 3678 (1.2 pCi/L) in the waste storage area A plume, Wells 3396 and 3126 (8.6 and 1.7 pCi/L, respectively) in South Plume B, and Well 3094 (1.5 pCi/L) in South Plume C.

Elevated concentrations of thorium-228 in unfiltered and filtered samples were detected in Type 2 and Type 3 wells; detections were isolated and many were below the maximum background values. Considering the low solubility of thorium (see Section 4.8.1) and the relatively few isolated detections greater than two times background, thorium-228 is not a major contaminant at the FEMP.

E.2.1.3 Fission Products

Strontium-90

Strontium-90 (Sr-90) is a fission product created through the nuclear fission of uranium-235. Strontium-90 does not occur in nature and its presence in the environment is due to human activities. Strontium-90 has entered the environment world wide as a byproduct of atmospheric release of fission products (such as from atmospheric weapons testing) and entered the FEMP as a contaminant in reactor uranium that was sent to the FEMP for recycle.

Strontium-90 in unfiltered samples has a 95th percentile background value of 0.65 pCi/L and background values that range from 0.65 to 4.8 pCi/L (Table E.0-2). Strontium-90 was not detected in filtered background samples; consequently any detection of strontium-90 is considered an above-background detection.

Plate E-100 is a contour map of strontium-90 activity concentrations in unfiltered groundwater samples from Type 2 wells. Strontium-90 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 11 of 137 wells (8 percent) and had a maximum concentration of 32.3 pCi/L (Table E.2-1). Strontium-90 was detected in unfiltered samples from Types 3 and 4 wells

at above-background concentrations less frequently than Type 2 wells (Tables E.2-2 and E.2-3). Strontium-90 was detected at a higher maximum concentration in the Type 2 wells than in the Type 3 and 4 wells. As is typical of most radiological and inorganic parameters at the FEMP, strontium-90 was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of strontium-90 greater than two times background were detected in unfiltered samples from isolated Type 2 wells in a few areas. Strontium-90 was detected in several wells in the waste storage area A plume. The maximum detection in the unfiltered Type 2 wells was in the waste storage area A plume in Well 2649 (7.6 pCi/L). Strontium-90 was also detected in three wells in the South Plume B: Wells 2899, 2128, and 2554 at activity concentrations of 1.40, 17.40, and 5.0 pCi/L, respectively. Strontium-90 was detected at concentrations greater than two times background in unfiltered samples from one Type 3 well (Well 3106, 2.10 pCi/L). Many of these results are comparable with the maximum background value of 4.8 pCi/L.

Strontium-90 was detected in three wells with concentrations greater than 1 pCi/L in filtered samples from Type 2 wells: Well 2954 (1.17 pCi/L), Well 2017 (5.69 pCi/L), and Well 2899 (1.40 pCi/L) located in South Plume B. Strontium-90 was detected at elevated concentrations in filtered samples from Type 4 Well 41066 (2.5 pCi/L) but not detected in filtered samples from Type 3 wells.

Isolated detections of elevated concentrations of strontium-90 in unfiltered and filtered samples were detected in Type 2, Type 3, and Type 4 wells. Considering the relatively few isolated detections that are greater than twice background, strontium-90 is not considered a major contaminant at the FEMP.

Technetium-99

Technetium-99 (Tc-99) is a fission product created in the nuclear fission of uranium-235. It does not occur in nature and its presence in the environment is due to human activities. Technetium-99 has entered the environment world wide as a byproduct of atmospheric release of fission products (such as from atmospheric weapons testing) and entered the FEMP as a contaminant in reactor uranium that was sent to the FEMP for recovery. Technetium-99 is a byproduct in the raffinates that remained at the FEMP after uranium was extracted in the refining process.

Technetium-99 in unfiltered samples has a 95th percentile background value of 22 pCi/L and background values that range from 22 to 26 pCi/L (Table E.0-2). Technetium-99 was not detected in

filtered background samples; consequently, any detection of technetium-99 is considered an above-background detection.

Plate E-101 is a contour map of technetium-99 activity concentrations in unfiltered groundwater samples from Type 2 wells. Technetium-99 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 12 of 140 wells (9 percent) and had a maximum concentration of 2110 pCi/L (Table E.2-1). Technetium-99 was detected in unfiltered samples from Type 3 wells at above-background concentrations less frequently than Type 2 wells (Table E.2-2 and E.2-3). Technetium-99 was not detected in Type 4 wells. Technetium-99 was detected at a higher maximum concentration in the Type 2 wells than in the Type 3 and 4 wells. As is typical of most radiological and inorganic parameters at the FEMP, technetium-99 was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of technetium-99 were detected in unfiltered samples from Type 2 wells, but are limited to a small area below the waste pits. Detections as high as 2110 pCi/L (Well 2019) were measured in groundwater in the waste storage area A plume. Other above-background detections of technetium-99 were measured but none were greater than two times background. Technetium-99 was not detected at elevated concentrations greater than two times background in unfiltered samples in Type 3 wells and was not detected above-background in Type 4 wells.

An elevated concentration of technetium-99 greater than 50 pCi/L in filtered samples from Type 2 wells was detected in Well 2643 (204 pCi/L). There were no detections greater than 50 pCi/L in filtered samples from Type 3 wells.

Elevated concentrations of technetium-99 were detected in the Great Miami Aquifer below the waste storage area in unfiltered groundwater samples from Type 2 wells; elevated concentrations in this area are part of the waste storage area A plume. Isolated detections of technetium-99 at above-background concentrations were also detected in South Plume B. Elevated concentrations are due to past site activities.

Cesium-137

Like strontium-90, cesium-137 (Cs-137) is a by-product of fission and is present in the raffinates that remained at the FEMP after uranium was extracted in the refining process.

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Cesium-137 in unfiltered samples has a 95th percentile background value of 5.8 pCi/L and background values that range from 5.8 to 6.7 pCi/L (Table E.0-2). Cesium-137 was not detected in filtered background samples; consequently, any detection of cesium-137 is considered an above-background detection.

Cesium-137 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 1 of 137 wells (Table E.2-1). Cesium-137 was not detected in filtered samples from Type 2 wells or in Type 2, Type 3 and Type 4 filtered and unfiltered samples.

Cesium-137 was detected in Type 2 Well 2064 (20 pCi/L) in the Plant 6 plume in an unfiltered sample. Considering the few isolated detection, cesium-137 is not considered a major contaminant at the FEMP.

Ruthenium-106

Like strontium-90 and cesium-137, ruthenium-106 (Ru-106) is a by-product of fission and is present in the raffinates that remain at the FEMP after uranium was extracted in the refining process. Ruthenium-106 is a fission product created in controlled nuclear fission when uranium-235 isotopes split; as such it does not occur in nature and its presence in the environment is due to human activities. Ruthenium-106 has entered the environment world wide as a byproduct of atmospheric release of fission products (such as from atmospheric weapons testing) and entered the FEMP as a contaminant in reactor returns that were sent to the FEMP to extract recoverable uranium. Ruthenium-106 was not detected in samples collected to determine its background value and the background concentration term for ruthenium-106 is assumed to be zero. In the 1993 data set, ruthenium-106 was not detected in any well.

E.2.1.4 Activation Products

Plutonium

During the period 1987 through 1993, 184 samples from Type 2, 3, and 4 wells were analyzed for isotopic plutonium (Pu) under the RI/FS program.

The tables of plutonium-238 and plutonium-239/-240 concentrations in groundwater each show positive detections of plutonium at levels less than 1.0 pCi/L for most of the data (Table E.2-1, E.2-2, and E.2-3).

Plutonium-239/240 was detected in the following wells in filtered and unfiltered samples: Well 2398 (1.4 pCi/L), Well 2426 (0.90 pCi/L), Well 2051 (1.0 pCi/L), Well 3070 (0.6 pCi/L), and Well 3398 (0.6 pCi/L). Plutonium was not detected in Type 4 wells.

Plutonium-238 was detected in the following wells in filtered and unfiltered samples: Well 2947 (0.89 pCi/L), Well 2385 (0.6370 pCi/L), Well 3398 (2.7 pCi/L), Well 3733 (0.5 pCi/L), Well 3821 (0.65 pCi/L), and Well 3423 (0.64 pCi/L).

Neptunium-237

Neptunium-237 (Np-237) in unfiltered samples has a 95th percentile background value of 0.25 pCi/L and background values that range from 0.25 to 0.62 pCi/L (Table E.0-2). Neptunium-237 in filtered samples has a 95th percentile background value of 0.12 pCi/L determined from one sample.

Neptunium-237 was detected in unfiltered samples from Type 2 wells at above-background concentrations in 1 of 123 wells (<1 percent). Neptunium-237 was also detected in filtered samples from Type 2 wells at above-background concentrations in 2 of 51 wells (4 percent). Neptunium-237 was detected less frequently in Type 3 wells and was not detected in Type 4 wells.

One isolated well had a detection of neptunium-237 above background in unfiltered samples from Type 2 wells. Well 2945 had a detected concentration of 0.7963 pCi/L. This is comparable to the maximum background value of 0.62 pCi/L. Neptunium-237 was not detected in Type 3 and Type 4 unfiltered samples.

Two isolated detections of neptunium-237 were detected at concentrations above-background in Type 2 Wells 2032 and 2106 (0.7383 and 2.5 pCi/L) from filtered samples. Neptunium-237 was also detected in a filtered sample from Type 3 Well 3128 at an activity concentration of 3.25 pCi/L.

Elevated concentrations of neptunium-237 in unfiltered and filtered samples were detected in Type 2 and Type 3 wells; however, these were isolated detections and neptunium-237 is not considered a major contaminant at the FEMP.

E.2.2 INORGANIC PARAMETERS

E.2.2.1 Aluminum

Aluminum in unfiltered samples has a 95th percentile background concentration of 0.225 mg/L and background values that range from 0.06 to 0.225 mg/L (Table E.0-2). Aluminum in filtered samples has a 95th percentile background concentration of 0.175 mg/L and background values that range from 0.062 to 0.175 mg/L.

Plate E-102 is a contour map of aluminum concentrations in unfiltered groundwater samples from Type 2 wells. Aluminum was detected in unfiltered samples from Type 2 wells at above-background concentrations in 33 of 133 wells (25 percent) and had a maximum concentration of 92 mg/L (Table E.2-1). Aluminum was detected in unfiltered samples from Type 3 and Type 4 wells at above-background concentrations less frequently than from Type 2 wells (Tables E.2-2 and E.2-3). Aluminum was detected at a higher maximum concentration in the Type 4 wells than the Type 3 wells. As is typical of most inorganic parameters at the FEMP, aluminum was detected less frequently and at lower concentrations in filtered samples than in unfiltered samples.

Elevated concentrations of aluminum were detected in unfiltered samples from Type 2 wells in each plume except the Plant 6 plume. Only one isolated detection of aluminum at an above-background concentration was found in South Plume C (2.590 mg/L in Well 2558). Elevated concentrations of aluminum were detected in multiple adjacent Type 3 and Type 4 wells in the waste storage area A plume and South Plume B. Isolated detections were found in Well 3016 in South Plume B (0.993 mg/L) and in Well 3091 along S.R. 128 (2.340 mg/L).

There were three isolated detections of aluminum at above-background concentrations in filtered samples from Type 2 wells. These wells are located in South Plume B near the PRRS, which is a known source of aluminum (ERM 1992), in the waste storage area B plume, and in South Plume A. Only the concentration in the well near the PRRS is greater than two times background. Concentrations above background were detected in filtered samples from isolated Type 3 and Type 4 wells outside of well-defined FEMP plumes, north and east of the site. These detections are less than 4 times background. One detection in Well 3899 (1.440 mg/L) northeast of the PRRS is above 8 times background.

Aluminum is naturally occurring in clays and other alumina-silicates in the Great Miami Aquifer and slightly elevated concentrations of aluminum in unfiltered samples in the Great Miami Aquifer are interpreted to represent variability in background concentrations. This is supported by the fact that aluminum was not detected consistently in areas of expected site contamination, except in the vicinity of the PRRS. In filtered samples, aluminum was rarely detected, and then only slightly above background, indicating that aluminum is not a major dissolved contaminant at the FEMP.

E.2.2.2 Antimony

Antimony was not detected in filtered and unfiltered samples collected to determine background; consequently, any detection of antimony is potentially an above-background value (Table E.0-2).

Plate E-103 is a contour map of antimony concentrations in unfiltered groundwater samples from Type 2 wells. Antimony was detected in unfiltered samples from Type 2 wells in two of 133 wells (1.5 percent) and had a maximum concentration of 0.005 mg/L in Well 2944 in South Plume A (Table E.2-1). The other detection was 0.003 mg/L in Well 2949 in the waste storage area A plume. Antimony was detected once (0.072 mg/L) in 77 unfiltered samples from Type 3 Well 3128 near the PRRS (Table E.2-2). Antimony was not detected in 21 unfiltered samples from Type 4 wells (Table E.2-3).

Antimony was detected in filtered samples from Type 2 wells at above-background concentrations in one of 135 wells at a concentration of 0.044 mg/L in an isolated well upgradient of the site. Antimony was also detected in filtered samples from one of 74 Type 3 wells (0.061 mg/L in Well 3128 near the PRRS) and none of the 20 Type 4 wells (the detection of 0.066 mg/L in Well 4013 in the waste storage area A plume is not considered representative of the Great Miami Aquifer).

The low number and the low concentrations of detections of antimony in filtered and unfiltered samples of groundwater from Type 2, 3, and 4 wells do not suggest that antimony is a major contaminant at the FEMP.

E.2.2.3 Arsenic

Arsenic in unfiltered samples has a 95th percentile background concentration of 0.0294 mg/L and background values that range from 0.0011 to 0.0294 mg/L (Table E.0-2). Arsenic in filtered samples

has a 95th percentile background concentration of 0.26 mg/L and background values that range from 0.002 to 0.55 mg/L.

Plate E-104 is a contour map of arsenic concentrations in unfiltered groundwater samples from Type 2 wells. Arsenic was detected in unfiltered samples from Type 2 wells at above-background concentrations in nine of 134 wells (7 percent) and had a maximum concentration of 0.35 mg/L (Table E.2-1). The majority of these detections, including the maximum concentration, were found in multiple adjacent wells in South Plume B. Arsenic was detected at above-background concentrations in unfiltered samples from three of 78 Type 3 wells (Table E.2-2). There were no detections of arsenic at above-background concentrations in 22 Type 4 wells (Table E.2-3). The maximum concentration in the Type 3 wells was 0.234 mg/L in South Plume B.

One Type 2 well (2679) and two Type 3 wells (3066 and 3679) upgradient of the site had elevated detections of arsenic in unfiltered samples of groundwater from the Great Miami Aquifer. The concentrations ranged from approximately background 0.029 mg/L in Well 3066 to 0.148 mg/L in Well 3679, a concentration greater than five times background. Due to their location upgradient of the site, the elevated concentrations of arsenic are more likely due to variability in naturally occurring arsenic concentrations than to site activities.

One detection of arsenic in an unfiltered sample from a Type 3 well was also greater than five times background; however, the data from this well (3009) are not considered indicative of Great Miami Aquifer conditions.

There were no detections of arsenic at above-background concentrations in filtered samples of groundwater from Type 2, 3, and 4 wells.

The lack of elevated concentrations of arsenic in filtered samples of groundwater from the Great Miami Aquifer and the data from unfiltered samples suggest that arsenic is only a major groundwater contaminant in the area of the PRRS, a known source of arsenic (ERM 1992).

E.2.2.4 Barium

Barium in unfiltered samples has a 95th percentile background concentration of 0.768 mg/L and background values that range from 0.0368 to 0.768 mg/L (Table E.0-2). Barium in filtered samples

has a 95th percentile background concentration of 0.669 mg/L and background values that range from 0.021 to 0.82 mg/L.

Plate E-105 is a contour map of barium concentrations in unfiltered groundwater samples from Type 2 wells. Barium was detected in unfiltered samples from Type 2 wells at above-background concentrations in two of 134 wells and had a maximum concentration of 8.69 mg/L (Table E.2-1). These detections, including the maximum concentration, were found in the vicinity of the PRRS plume. These detections can be attributed to the PRRS area (ERM 1992). A third detection (1.590 mg/L in Well 2754) was in an isolated well upgradient of the site and is not considered indicative of Great Miami Aquifer conditions. Barium was not detected in unfiltered samples from Type 3 and 4 wells at above-background concentrations (Tables E.2-2 and E.2-3).

Barium was detected in filtered samples from Type 2 wells at above-background concentrations in one of 147 wells at a concentration of 0.82 mg/L northwest of the site. Barium was not detected in filtered samples from Type 3 and 4 wells.

The low number and the locations of elevated concentrations of barium in filtered and unfiltered samples of groundwater from the Great Miami Aquifer suggest that barium is only a major groundwater contaminant in the area of the PRRS, a known source of barium (ERM 1992).

E.2.2.5 Beryllium

Beryllium in filtered samples has a 95th percentile background concentration of 0.0022 mg/L and background values that range from 0.001 to 0.0023 mg/L (Table E.0-2). Beryllium was not detected in unfiltered samples collected to determine background; consequently, any detection of beryllium is potentially an above-background value.

Plate E-106 is a contour map of beryllium concentrations in unfiltered groundwater samples from Type 2 wells. Beryllium was detected in unfiltered samples from Type 2 wells in 1 of 133 wells at a concentration of 0.0015 mg/L (Well 2128 in the PRRS plume) (Table E.2-1). Well 2754, presented on the isoconcentration map upgradient of the site, is not considered indicative of Great Miami Aquifer conditions. Beryllium was detected in unfiltered samples from Type 3 wells in 1 of 78 wells at a concentration of 0.178 mg/L (Well 3128) (Table E.2-2). A concentration of 0.125 mg/L was detected in Well 3009; however, data from this well is not considered indicative of Great Miami

Aquifer conditions. Beryllium was not detected in unfiltered samples from Type 4 wells (Table E.2-3).

Elevated concentrations of beryllium were not detected in filtered samples from Type 2 or Type 4 wells. Beryllium was detected in filtered samples from Type 3 wells at above-background concentrations in 1 of 75 wells at a concentration of 0.174 mg/L (Well 3128). Well 3128 is located in the PRRS plume. One concentration of 0.131 mg/L in Well 3009 is not considered indicative of Great Miami Aquifer conditions.

Elevated concentrations of beryllium were detected in filtered and unfiltered samples only from Wells 2128 and 3128 in the vicinity of the PRRS plume. The absence of elevated detections of beryllium in groundwater samples suggests that beryllium is not a major contaminant at the FEMP.

E.2.2.6 Cadmium

Cadmium in unfiltered samples has a 95th percentile background concentration of 0.0135 mg/L and background values that range from 0.0022 to 0.0135 mg/L (Table E.0-2). Cadmium in filtered samples has a 95th percentile background concentration of 0.006 mg/L and background values that range from 0.002 to 0.01 mg/L.

Plate E-107 is a contour map of cadmium concentrations in unfiltered groundwater samples from Type 2 wells. Cadmium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 5 of 134 wells and had a maximum concentration of 0.046 mg/L in Well 2420 (Table E.2-1). The detection of cadmium of 0.127 mg/L in Well 2754 presented on the isoconcentration map upgradient of the site is not considered indicative of Great Miami Aquifer conditions. Cadmium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 3 of 77 wells and had a maximum concentration of 0.211 mg/L in Well 3128 in the vicinity of the PRRS plume (Table E.2-2). Cadmium was not detected in unfiltered samples from Type 4 wells at above-background concentrations (Table E.2-3).

Cadmium was detected in filtered samples from Type 2 wells at above-background concentrations in 8 of 147 wells and had a maximum concentration of 0.033 mg/L in Well 2420 east of the production area. The detection of cadmium of 0.0345 mg/L in Well 2754 in the far northeast of the site is not considered indicative of Great Miami Aquifer conditions, and although presented on the

isoconcentration map, was not included in the data statistics. Cadmium was detected in filtered samples from Type 3 wells at above-background concentrations in 2 of 80 wells with a maximum concentration of 0.203 mg/L in Well 3128 in the PRRS area. There were no detections above background in filtered samples from Type 4 wells.

The low number, and the locations of elevated concentrations of cadmium in filtered and unfiltered samples of groundwater from the Great Miami Aquifer suggest that cadmium is not a major groundwater contaminant at the FEMP.

E.2.2.7 Calcium

Calcium in unfiltered samples has a 95th percentile background concentration of 159 mg/L and background values that range from 78 to 162 mg/L (Table E.0-2). Calcium in filtered samples has a 95th percentile background concentration of 136 mg/L and background values that range from 63.6 to 181 mg/L.

Plate E-108 is a contour map of calcium concentrations in filtered groundwater samples from Type 2 wells. Plate E-109 is a contour map of calcium concentrations in filtered groundwater samples from Type 3 and Type 4 wells.

Calcium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 25 of 134 wells (19 percent) and had a maximum concentration of 411 mg/L in Well 2128 near the PRRS plume (Table E.2-1). The PRRS is a known source of calcium (ERM 1992).

Calcium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 9 of 78 wells (12 percent) and had a maximum concentration of 308 mg/L in Well 3027 in the waste storage area A plume (Table E.2-2). Calcium was detected in unfiltered samples from Type 4 wells at above-background concentrations in 2 of 22 wells (9 percent) and had concentrations of 190.0 mg/L in Well 41217 and 174.0 mg/L in Well 4426 (Table E.2-3). Both wells are east of the production area. The elevated detection of calcium in Well 4013 (248 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Calcium was detected in filtered samples from Type 2 wells at above-background concentrations in 34 of 147 wells (23 percent) and had a maximum concentration of 334 mg/L in Well 2388 in the

Plant 6 plume. One area of elevated calcium concentrations is apparent in the Plant 6 plume on the isoconcentration map for Type 2 wells (Plate E-108). A large area of elevated calcium concentrations is also present in the waste storage area A plume. Another area of multiple high concentrations of calcium is in South Plume A.

Calcium was detected in filtered samples from Type 3 wells at above-background concentrations in 8 of 81 wells (10 percent) with a maximum concentration of 332 mg/L in Well 3037 in Waste Storage Area A Plume. Calcium was detected in filtered samples from Type 4 wells at above-background concentrations in 3 of 22 wells (14 percent) with a maximum concentration of 176.0 mg/L in Well 4426 in the Plant 6 plume. Elevated concentrations of calcium primarily occur within the waste storage area A plume. The elevated detection of calcium in Well 4013 (248.0 mg/L) presented in the waste storage area A plume on the isoconcentration map is not considered indicative of Great Miami Aquifer conditions and is not included in the data statistics.

Although calcium is naturally occurring in carbonate minerals of the aquifer, plumes of elevated concentrations of calcium indicate that site activities have apparently affected the calcium concentration in the Great Miami Aquifer in the areas discussed above. The elevated concentrations of calcium in the PRRS plume are attributable to the PRRS area (ERM 1992).

E.2.2.8 Chromium

Chromium in unfiltered samples has a 95th percentile background concentration of 0.0211 mg/L and background values that range from 0.0067 to 0.0211 mg/L (Table E.0-2). Chromium in filtered samples has a 95th percentile background concentration of 0.03 mg/L and background values that range from 0.008 to 0.0441 mg/L.

Plate E-110 is a contour map of chromium concentrations in unfiltered groundwater samples from Type 2 wells. Chromium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 9 of 135 wells (7 percent) and had a maximum concentration of 1.110 mg/L in Well 2624 in South Plume B (Table E.2-1). Elevated concentrations of chromium were detected in two adjacent Type 2 wells in South Plume A. The elevated detection of chromium upgradient of the site (7.71 mg/L in Well 2754) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Chromium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 2 of 78 wells (3 percent) with concentrations of 0.029 mg/L in Well 3899 and 0.405 mg/L in Well 3128 in the PRRS plume (Table E.2-2). Chromium was detected in unfiltered samples from Type 4 wells at above-background concentrations in 2 of 22 wells (9 percent) and had concentrations of 0.024 mg/L in Well 4125 in the PRRS plume and 0.142 mg/L in Well 41066 in the waste storage area A plume (Table E.2-3). The elevated detection of chromium in Well 3009 (0.262 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Chromium was detected in filtered samples from Type 2 wells at above-background concentrations in 11 of 147 wells (7 percent) and had a maximum concentration of 0.208 mg/L in Well 2129 in the PRRS plume. The maximum concentration detected in filtered samples from Type 2 wells in the FEMP area was 0.048 mg/L in Well 2053 in the waste storage area B plume.

Chromium was detected in filtered samples from Type 3 wells at above-background concentrations in 6 of 80 wells (8 percent) with a maximum concentration of 0.397 mg/L in Well 3128 near the PRRS. Chromium in Type 4 wells was detected in filtered samples in one well at background (Well 4023 northeast of the site) and slightly above background (Well 4125 in the vicinity of the PRRS).

Elevated concentrations of chromium were detected in filtered and unfiltered groundwater samples in the PRRS plume. This contamination is attributable to the PRRS area, a known source of chromium (ERM 1992). The two adjacent wells with elevated chromium concentrations in South Plume A may indicate that site activities have affected Great Miami Aquifer chromium concentrations in that area. The limited number and low concentrations of chromium in groundwater samples from other areas of the site suggests that chromium is not a major contaminant at the FEMP.

E.2.2.9 Cobalt

Cobalt in unfiltered samples has a 95th percentile background concentration of 0.0086 mg/L (Table E.0-2). This value is based on one detection of 0.0086 mg/L. Cobalt was not detected in filtered samples collected to determine background; consequently, any detection of cobalt in filtered samples is potentially an above-background value.

Plate E-111 is a contour map of cobalt concentrations in unfiltered groundwater samples from Type 2 wells. Cobalt was detected in unfiltered samples from Type 2 wells at above-background

concentrations in 6 of 133 wells (5 percent) and had a maximum concentration of 0.168 mg/L in Well 2548 in South Plume B (Table E.2-1). This detection was one of three in South Plume B; however, these three elevated concentrations were also within the PRRS plume. There were no detections within South Plume B which were not in the PRRS plume, indicating that the contamination may be attributable to the PRRS area.

Two detections of elevated cobalt in unfiltered samples from Type 2 wells are in the Plant 6 plume. One additional detection of 0.009 mg/L (Well 2733) is approximately 1600 feet east of South Plume B. One high detection of 0.305 mg/L in Well 2754 is not considered indicative of Great Miami River Aquifer conditions and although presented on the isoconcentration map, is not included in the data statistics.

Cobalt was detected in unfiltered samples from Type 3 wells at above-background concentrations in 3 of 78 wells (4 percent) with a maximum concentration of 0.528 mg/L in Well 3128 in the South Plume B (Table E.2-2). This detection was also in the PRRS plume. The other two detections which are only slightly above background are within the waste storage area A plume. Cobalt was not detected in unfiltered samples from Type 4 wells at above-background concentrations (Table E.2-3). The elevated detections of cobalt in Wells 3009 (0.262 mg/L), 4013 (0.0129 mg/L), and 41240 (0.0694 mg/L) presented on the isoconcentration map are not considered indicative of Great Miami Aquifer conditions and were not included in the data statistics.

Cobalt was detected in filtered samples from Type 2 wells in 5 of 136 wells (4 percent) and had a maximum concentration of 0.0138 mg/L in Well 2388. Four of these detections, including the maximum concentration, were within the Plant 6 plume. The fifth detection (0.011 mg/L) was in Well 2423 just northeast of the waste storage area A plume.

Cobalt was detected in filtered samples from Type 3 wells in 4 of 75 wells (5 percent) with a maximum concentration of 0.516 mg/L in Well 3128 in South Plume B. This well is also in the PRRS Plume. No other detections were within the South Plume B. Two elevated detections were within the Plant 6 Plume and one elevated detection of 0.007 mg/L was almost 1600 feet east of South Plume B. The single elevated concentration of cobalt detected in filtered samples from Type 4 wells was a concentration of 0.0089 mg/L in Well 4013 which is not considered indicative of Great Miami Aquifer conditions, and therefore was not included in the data statistics.

Two potential plumes of slightly elevated concentrations of cobalt were detected in filtered and unfiltered groundwater samples in the Plant 6 and PRRS Plumes. Cobalt contamination at the site may be attributable both to the FEMP and to the PRRS area. Elevated concentrations in the Plant 6 plume suggest that contamination in this area is due to site activities at the FEMP, but elevated concentrations in the PRRS plume may be associated with the PRRS.

E.2.2.10 Copper

Copper in unfiltered samples has a 95th percentile background concentration of 0.0354 mg/L and background values that range from 0.0113 to 0.0354 mg/L (Table E.0-2). Copper in filtered samples has a 95th percentile background concentration of 0.083 mg/L and background values that range from 0.01 to 0.176 mg/L.

Plate E-112 is a contour map of copper concentrations in filtered groundwater samples from Type 2 wells. Copper was detected in filtered samples from Type 2 wells at above-background concentrations in 2 of 147 wells (14 percent) (Table E.2-1). A copper concentration of 0.27 mg/L was detected in Well 2036, located over 3500 feet west of any known plume or potential source of contamination. A copper concentration of 0.12 mg/L was detected in Well 2121, located too far east of the eastern edge of the site to be located on the isoconcentration map.

Copper was detected in filtered samples from Type 3 wells at above-background concentrations in 1 of 80 wells with a concentration of 0.186 mg/L in Well 3128 in South Plume B (Table E.2-2). Since there were no other detections within South Plume B and this well is also in the PRRS plume, the data suggest that any potential copper contamination would be associated with the PRRS area known as a source of copper (ERM 1992). Copper was not detected in filtered samples from Type 4 wells at above-background concentrations (Table E.2-3).

An elevated detection of copper found in a filtered sample from Well 3009 (0.318 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Copper was detected in unfiltered samples from Type 2 wells at above-background concentrations in 6 of 134 (4 percent) wells and had a maximum concentration of 0.694 mg/L in Well 2548 in South Plume B. Four elevated detections of copper, including the maximum, were found in South Plume B. However, three of these detections were also in the PRRS plume and the fourth is just north of the

PRRS plume. No other concentrations of copper were elevated in wells in South Plume B, suggesting that any copper contamination is associated with the PRRS area. One isolated detection of copper (0.176 mg/L in Well 2021) in unfiltered samples was found in the waste storage area A plume.

An elevated detection of copper found in an unfiltered sample from Well 2754 (0.726 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Copper was detected in unfiltered samples from Type 3 wells at above-background concentrations in 2 of 78 wells with concentrations of 0.06 mg/L in Well 3689 and 0.190 in Well 3128. Although both wells are in South Plume B, they are also within the PRRS plume and as no other detections of copper in South Plume B but outside the PRRS plume were elevated, the data suggest that any copper contamination is associated with the PRRS area, a known source of copper (ERM 1992). Copper was not detected in unfiltered samples from Type 4 wells.

Since there was only one elevated concentration of copper in the groundwater which was within the site boundaries and not attributable to the PRRS plume, the data does not suggest that copper is a major contaminant at the FEMP.

E.2.2.11 Cyanide

Cyanide was not detected in filtered or unfiltered samples collected to determine background; consequently, any detection of cyanide is potentially an above-background value (Table E.0-2).

Plate E-113 is a contour map of cyanide concentrations in unfiltered groundwater samples from Type 2 wells. Cyanide was detected in unfiltered samples from Type 2 wells at above-background concentrations in 2 of 137 wells with concentrations of 0.044 mg/L in Well 2022 and 0.04 mg/L in Well 2071 (Table E.2-1). Well 2022 is within the waste storage area A plume; however, Well 2071 is more than 1600 feet northeast of the nearest plume or potential source of contamination.

Cyanide was detected in an unfiltered sample from a Type 3 well (Well 3009, 0.36 mg/L). Data from this well are not considered indicative of Great Miami River Aquifer conditions and although presented on the isoconcentration map, are not included in the data statistics (Table E.2-2). Cyanide was not detected in unfiltered samples from Type 4 wells at above-background concentrations (Table E.2-3).

Cyanide was detected in filtered samples from Type 2 wells in 3 of 108 wells and had a maximum concentration of 0.07 mg/L in Well 2046. Well 2046 falls within South Plume A. The other two elevated detections of cyanide were found in Wells 2550 (0.023 mg/L) and 2002 (0.055 mg/L) in South Plume B.

Cyanide was detected in filtered samples from Type 3 wells at above-background concentrations only in Well 3009 (0.354 mg/L). Data from this well are not considered indicative of Great Miami River Aquifer conditions and are not included in the data statistics (Table E.2-2). Cyanide was not detected in filtered samples from Type 4 wells (Table E.2-3).

Because cyanide was not detected in filtered or unfiltered samples from Type 3 or 4 wells and is only present in isolated occurrences in Type 2 wells, cyanide is not considered a major contaminant at the FEMP.

E.2.2.12 Iron

Iron in unfiltered samples has a 95th percentile background concentration of 5.72 mg/L and background values that range from 0.312 to 5.5 mg/L (Table E.0-2). Iron in filtered samples has a 95th percentile background concentration of 4.14 mg/L and background values that range from 0.007 to 5.42 mg/L.

Plate E-114 is a contour map of iron concentrations in unfiltered groundwater samples from Type 2 wells. Plate E-115 is a contour map of iron concentrations in unfiltered groundwater samples from Types 3 and 4 wells.

Iron was detected in unfiltered samples from Type 2 wells at above-background concentrations in 22 of 134 wells (16 percent) with a maximum concentration of 913 mg/L in Well 2548 in South Plume B (Table E.2-1). The highest concentrations of iron were found in South Plume B, where concentration data indicate a plume due to the PRRS (ERM 1992). A second area of elevated iron concentrations is located in the waste storage area A plume. Two elevated detections of iron were found in South Plume A (Well 2047, 13.8 mg/L and Well 2944, 15.1 mg/L). One isolated above-background detection of iron (10.6 mg/L in Well 2094) is in South Plume C and another (8.52 mg/L in Well 2679) is located north and upgradient of the waste storage area A plume. The elevated

detection of iron in Well 2754 (611 mg/L) presented on the isoconcentration map is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Iron was detected in unfiltered samples from Type 3 wells at above-background concentrations in 13 of 76 wells (17 percent) and had a maximum concentration of 78.9 mg/L in Well 3024 in the waste storage area A plume (Table E.2-2). This high detection is within an apparently large plume of elevated iron concentrations on the north edge of the site. Iron was detected in unfiltered samples from Type 4 wells at above-background concentrations in 4 of 22 wells (18 percent) and had a maximum concentration of 16.9 mg/L in Well 41066 (Table E.2-3). There are also two elevated concentrations in Wells 3066 and 3679 northwest of the waste storage area A plume and two slightly elevated concentrations in Wells 41217 and 4426 east of the waste storage area A plume. One isolated elevated concentration of iron was found in Well 3091 more than 2400 feet east of the nearest plume or potential source of contamination. Two elevated detections were within the waste storage area B plume (6.39 mg/L in Well 3008 and 21.8 mg/L in Well 3018). One isolated detection of elevated iron concentration was within the PRRS plume (46.1 mg/L in Well 3689).

Iron was detected in filtered samples from Type 3 wells at above-background concentrations in 11 of 80 wells (14 percent) and had a maximum concentration of 22 mg/L in Well 3066 northwest and upgradient of the waste storage area A plume. Iron was detected in filtered samples from Type 4 wells at above-background concentrations in 4 of 22 wells (18 percent) and had a maximum concentration of 15.9 mg/L in Well 41066 in the waste storage area A plume. Two slightly elevated concentrations (7.5 mg/L in Well 4426 and 5.14 mg/L in Well 4064) were detected in the Plant 6 plume.

The large area of elevated concentrations of iron found in both filtered and unfiltered data from Types 3 and 4 wells in the waste storage area A plume and upgradient of this plume may represent water with a high iron concentration flowing out of the Shandon Trough. The higher concentrations in the Operable Unit 1 waste pit area and Operable Unit 2 solid waste landfill may represent the same area of high iron concentrations as is presented in these areas in the Type 2 well data. These data may indicate elevated iron concentrations which are due to past site activities at the FEMP; however, the extent and pattern of high iron values on the north edge of the site are probably a natural part of groundwater that flows into the Great Miami Aquifer from the Shandon Trough, and subsequently flows east as a component of the Great Miami Aquifer.

Data from unfiltered samples of groundwater from Type 2 wells suggest that the groundwater in South Plume B may also have high iron concentrations. This is attributable to the PRRS area (ERM 1992).

E.2.2.13 Lead

Lead in unfiltered samples has a 95th percentile background concentration of 0.002 mg/L. Background for lead was determined on one sample with a value of 0.002 (Table E.0-2). Lead in filtered samples has a 95th percentile background concentration of 0.009 mg/L and background values that range from 0.0016 to 0.029 mg/L.

Plate E-116 is a contour map of lead concentrations in unfiltered groundwater samples from Type 2 wells. Plate E-117 is a contour map of lead concentrations in unfiltered groundwater samples from Types 3 and 4 wells. Lead was detected in unfiltered samples from Type 2 wells at above-background concentrations in 29 of 134 wells (22 percent) and had a maximum concentration of 0.244 mg/L in Well 2548 in South Plume B (Table E.2-1). Elevated concentrations of lead were detected in wells in the waste storage area A and B plumes, and South Plumes A and B. The elevated detection of lead in Well 2754 (0.262 mg/L) presented on the isoconcentration map is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Lead was detected in unfiltered samples from Type 3 wells at above-background concentrations in 14 of 78 wells (18 percent) with a maximum concentration of 0.295 mg/L in Well 3128 in South Plume B (Table E.2-2). Lead was detected in unfiltered samples from Type 4 wells at above-background concentrations in 4 of 22 wells (6 percent) with concentrations of 0.013 mg/L (Well 41066) in the waste storage area A plume and 0.003 mg/L (Well 4015) in South Plume B (Table E.2-3).

Lead was detected in filtered samples from Type 2 wells at above-background concentrations in 3 of 147 wells (2 percent) and had a maximum concentration of 0.0132 mg/L in Well 2900 in South Plume B. The other two isolated detections above background were only slightly elevated and were found in the Plant 6 Plume and east of the waste storage area B plume.

Lead was detected in filtered samples from Type 3 wells at above-background concentrations in 2 of 80 wells (2 percent) and had a maximum concentration of 0.3 mg/L in Well 3128 in South Plume B. The other well with an elevated concentration of lead was Well 3070 east of South Plume B

(0.065 mg/L). An elevated detection of lead in a filtered sample from Well 3009 (0.075 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Lead was detected in filtered samples from Type 4 wells at above-background concentrations in 1 of 22 wells with a concentration of 0.0132 mg/L in Well 41066 in the waste storage area A plume.

The elevated concentrations of lead in filtered and unfiltered samples of groundwater from Type 2, 3, and 4 wells were isolated and do not indicate that site activities have had a major impact on lead concentrations in the Great Miami Aquifer.

E.2.2.14 Magnesium

Magnesium in unfiltered samples has a 95th percentile background concentration of 38.5 mg/L and background values that range from 20.1 to 39 mg/L (Table E.0-2). Magnesium in filtered samples has a 95th percentile background concentration of 37.8 mg/L and background values that range from 15.7 to 46 mg/L.

Plate E-118 is a contour map of magnesium concentrations in unfiltered groundwater samples from Type 2 wells. Plate E-119 is a contour map of magnesium concentrations in unfiltered groundwater samples from Types 3 and 4 wells.

Magnesium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 29 of 134 wells (22 percent) and had a maximum concentration of 507 mg/L in Well 2548. The highest concentration of magnesium was 507 mg/L in Well 2548, which is located within the PRRS plume (Plate E-118). Concentrations of magnesium at above-background concentrations were also detected in the waste storage area A plume (six wells with a maximum concentration of 154 mg/L in Well 2028), the Plant 6 plume (five wells with a maximum of 56.8 mg/L), South Plume A (2 wells with a maximum of 60.2 mg/L), South Plume B (10 wells with a maximum of 507 mg/L, and the waste storage area B plume (Well 2047 with a concentration of 60 mg/L).

Magnesium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 10 of 78 wells (13 percent) and had a maximum concentration of 76.6 mg/L in Well 3027 in the waste storage area A plume (Table E.2-2). Magnesium was detected in unfiltered samples from

Type 4 wells at above-background concentrations in 4 of 22 wells (18 percent) and had a maximum concentration of 66 mg/L in Well 41217 east of the waste storage area A plume (Table E.2-3).

The highest concentrations of magnesium in unfiltered samples from Type 3 and 4 wells were detected in the waste storage area A plume or east of this plume. One elevated concentration in Well 3066 (56.4 mg/L) was detected upgradient of the production facility and two elevated concentrations were detected in wells east of the waste storage area A plume. One additional detection was measured in Well 4426 within the Plant 6 Plume (55.4 mg/L).

Magnesium was detected in filtered samples from Type 2 wells at above-background concentrations in 24 of 147 wells and had a maximum concentration of 158 mg/L in Well 2028 in the waste storage area A plume. Other areas with elevated detections of magnesium in filtered samples from Type 2 wells were within the Plant 6 plume, South Plumes A and B, and in several wells outside of any of the six known contaminant plumes.

Magnesium was detected in filtered samples from Type 3 wells at above-background concentrations in 8 of 81 wells and had a maximum concentration of 75.4 mg/L. A large area of elevated concentrations of magnesium was found within the waste storage area A plume. Elevated concentrations of magnesium were also detected in filtered samples from two upgradient Type 3 wells (Wells 3066 and 3679).

Magnesium was detected in filtered samples from Type 4 wells at above-background concentrations in 4 of 22 wells and had a maximum concentration of 55.7 mg/L in Well 4426 in the Plant 6 plume.

The large area of elevated concentrations of magnesium found in both filtered and unfiltered data from Types 3 and 4 wells in the waste storage area A plume and upgradient of this plume may represent water with a high magnesium concentration flowing out of the Shandon Trough. The higher concentrations in the Operable Unit 1 waste pit area and Operable Unit 2 solid waste landfill may represent the same area of high magnesium concentrations as is presented in these areas in the Type 2 well data. These data may indicate elevated magnesium concentrations which are due to past site activities at the FEMP; however, the extent and pattern of high magnesium values on the north edge of the site are probably a natural part of groundwater that flows into the Great Miami Aquifer from the Shandon Trough, and subsequently flows east as a component of the Great Miami Aquifer.

Elevated concentrations of magnesium in filtered and unfiltered samples of groundwater from Type 2 wells in South Plumes A and B suggest that site activities have affected groundwater in the Great Miami Aquifer in isolated areas. A plume of higher concentrations of magnesium is present over the PRRS, suggesting that site activities there may have also affected magnesium concentrations in the Great Miami Aquifer.

E.2.2.15 Manganese

Manganese in unfiltered samples has a 95th percentile background concentration of 0.904 mg/L and background values that range from 0.0043 to 0.904 mg/L (Table E.0-2). Manganese in filtered samples has a 95th percentile background concentration of 0.78 mg/L and background values that range from 0.002 to 0.916 mg/L.

Plate E-120 is a contour map of manganese concentrations in unfiltered groundwater samples from Type 2 wells. No contour map for manganese concentrations in unfiltered groundwater samples from Types 3 and 4 wells was generated because the majority of the wells exhibited concentrations below background values.

Manganese was detected in unfiltered samples from Type 2 wells at above-background concentrations in 11 of 134 wells (8 percent) and had a maximum concentration of 139 mg/L in Well 2548 (Table E.2-1), which is located within South Plume B (Plate E-120). Several high concentrations of manganese were detected in South Plume B; however, all elevated detections in South Plume B were also within the PRRS plume, a known source of manganese (ERM 1992). Elevated concentrations of manganese were detected in two adjacent wells in the Plant 6 plume (1.080 mg/L in Well 2388 and 2.660 mg/L in Well 2064). The elevated detection of manganese in Well 2754 (12.40 mg/L) presented on the isoconcentration map is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Elevated concentrations of manganese were also detected in isolated wells in waste storage area B and South Plume A.

Manganese was detected in unfiltered samples from Type 3 wells at above-background concentrations in 4 of 78 wells (5 percent) and had a maximum concentration of 2.4 mg/L in Well 3010 in the waste storage area A plume (Table E.2-2). In unfiltered samples from Type 4 wells, manganese was detected at above-background concentrations in 2 of 22 wells (9 percent) with concentrations of

0.929 mg/L in Well 4016 and 0.904 mg/L in Well 4096 (Table E.2-3). Well 4096 is within the South Plume A and Well 4096 is west of South Plume A.

Manganese was detected in filtered samples from Type 2 wells at above-background concentrations in 5 wells and had a maximum concentration of 1.580 mg/L in Well 2127 in South Plume C. There were also isolated detections in the Plant 6 plume and the waste storage area A plume. The elevated detection of manganese in Well 2754 (1.420 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Manganese was detected in filtered samples from Type 3 wells at above-background concentrations in 2 of 80 wells with concentrations of 1.65 mg/L in Well 3027 and 0.795 mg/L in Well 3821 in the waste storage area A plume. Manganese was detected in filtered samples from Type 4 wells at above-background concentrations in 2 of 22 wells (9 percent) with concentrations of 1.110 mg/L in Well 4016 and 0.916 mg/L in Well 4096 (Table E.2-3). Well 4096 is within the South Plume A and Well 4096 is west of South Plume A.

The elevated concentrations of manganese in unfiltered samples of groundwater from Type 2 wells were near background and isolated and do not indicate that site activities have had a major impact on manganese concentrations in the Great Miami Aquifer with the exception of those wells within the PRRS plume south of the FEMP. This contaminant plume is attributable to the PRRS (ERM 1992). The elevated concentrations of manganese in filtered and unfiltered samples of groundwater from Type 3 and 4 wells indicate that site activities may have affected manganese concentrations in the Great Miami Aquifer in the waste storage area A plume and South Plume A. However, these concentrations are less than three times background and may only represent the variability of background.

E.2.2.16 Mercury

Mercury was not detected in unfiltered samples collected to determine background; consequently, any detection of mercury is potentially an above-background value (Table E.0-2). Mercury in filtered samples has a 95th percentile background concentration of 0.0004 mg/L and background values that range from 0.0002 to 0.001 mg/L. No contour maps of mercury concentrations in filtered or unfiltered groundwater samples from Type 2, 3, or 4 wells were generated, because concentrations were near background and isolated.

000161

All detections of mercury in unfiltered samples were within South Plume B. Mercury was detected in unfiltered samples from Type 2 wells in 2 of 137 wells with concentrations of 0.006 mg/L in Well 2636 and 0.004 mg/L in Well 2548 (Table E.2-1). Mercury was detected in one unfiltered sample from 78 Type 3 wells at a concentration of 0.0049 mg/L in Well 3128 (Table E.2-2). An elevated detection of mercury in Well 3009 (0.0077 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Mercury was detected in one unfiltered sample from 22 Type 4 wells at a concentration of 0.0002 mg/L in Well 4125 (Table E.2-3).

Mercury was not detected at above-background concentrations in filtered samples from Type 2 wells. Mercury was detected in two filtered samples from Type 3 wells at an above-background concentration of 0.0052 mg/L in Well 3128 (Table E.2-2), located in South Plume B. An elevated detection of mercury in Well 3009 (0.0139 mg/L) is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Mercury was not detected at above-background concentrations in filtered samples from Type 4 wells.

All elevated concentrations of mercury in groundwater samples from the Great Miami Aquifer were in South Plume B. These wells are also located within the PRRS plume and may be attributable to site activities at the PRRS. The absence of elevated concentrations of mercury in groundwater samples at the FEMP indicates that site activities have not had an impact on mercury concentrations in the Great Miami Aquifer.

E.2.2.17 Molybdenum

Molybdenum was not detected in unfiltered samples collected to determine background; consequently, any detection of molybdenum is potentially an above-background value (Table E.0-2). Molybdenum in filtered samples has a 95th percentile background concentration of 0.025 mg/L and background values that ranged from 0.004 to 0.04 mg/L (Table E.0-2).

Plate E-121 is a contour map of molybdenum concentrations in unfiltered groundwater samples from Type 2 wells. Molybdenum was detected in unfiltered samples from Type 2 wells in 6 of 72 wells (8 percent) and had a maximum concentration of 0.435 mg/L in Well 2649 (Table E.2-1) which is located within the waste storage area A plume. One isolated detection was found in waste storage

area B plume (0.007 mg/L in Well 2935) and one isolated detection was found in the Plant 6 plume (0.014 mg/L in Well 2067). The other three detections were found in South Plume B.

Molybdenum was detected in one unfiltered sample from Type 3 wells at a concentration of 0.0154 mg/L in Well 3037 which is located within the waste storage area A plume (Table E.2-2). Molybdenum was also detected in only one unfiltered sample from Type 4 wells at a concentration of 0.01 mg/L in Well 4125 (Table E.2-3). Well 4125 is located in South Plume B.

Molybdenum was detected in filtered samples from Type 2 wells at above-background concentrations in 2 of 130 wells at concentrations of 0.327 mg/L in Well 2649 in the waste storage area A plume and 0.049 mg/L in Well 2014 in South Plume B. Molybdenum was not detected at above-background concentrations in filtered samples from Types 3 or 4 wells (Tables E.2-2 and E.2-3).

Molybdenum was detected infrequently in the Type 2, 3, and 4 wells in the Great Miami Aquifer. Detections of molybdenum occurred in isolated wells and nearby wells did not have elevated levels of molybdenum. The data suggests that Molybdenum is not a major contaminant at the FEMP.

E.2.2.18 Nickel

Nickel in unfiltered samples has a 95th percentile background concentration of 0.0514 mg/L based on one background value (Table E.0-2). Nickel in filtered samples has a 95th percentile background concentration of 0.023 mg/L and background values that range from 0.012 to 0.0279 mg/L.

Plate E-122 is a contour map of nickel concentrations in unfiltered groundwater samples from Type 2 wells. Nickel was detected in unfiltered samples from Type 2 wells at above-background concentrations in 5 of 134 wells (4 percent) with the highest concentrations in South Plume B (Table E.2-1). The maximum concentration in this area was 0.621 mg/L in Well 2624. Other elevated concentrations were found only in isolated wells and only at concentrations slightly above background. An elevated concentration in Well 2754 (3.93 mg/L) presented on the isoconcentration map as upgradient of the site is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Nickel was detected in one unfiltered sample from Type 3 wells at an above-background concentration of 0.547 mg/L in Well 3128 in South Plume B (Table E.2-2). An elevated concentration in Well 3009

(0.131 mg/L) presented on the isoconcentration map is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Nickel was detected in one unfiltered sample from 22 Type 4 wells at an above-background concentration of 0.117 mg/L in Well 41066 in the waste storage area A plume (Table E.2-3).

Nickel was detected in filtered samples from Type 2 wells at above-background concentrations in 9 of 147 wells (7 percent) and had a maximum concentration of 0.135 mg/L in Well 2560 which is located in South Plume C (Table E.2-1). Elevated concentrations of nickel were also detected in the waste storage area A and B plumes, South Plume B, and several isolated wells east of any known contaminant plumes. A detection of 0.589 mg/L in Well 2754 upgradient of the site is not considered indicative of Great Miami Aquifer conditions. Nickel was detected in filtered samples from Type 3 wells at above-background concentrations in 2 of 80 wells at concentrations of 0.518 mg/L in Well 3128 in South Plume B and 0.029 mg/L in Well 3004 in the waste storage area A plume. The detection of 0.137 mg/L in Well 3009 is not considered indicative of Great Miami Aquifer conditions. Nickel was not detected in filtered samples from Type 4 wells at above-background concentrations.

The elevated concentrations of nickel in unfiltered samples of groundwater from Types 2 wells were near background and isolated and do not indicate that site activities have had an impact on nickel concentrations in the Great Miami Aquifer, with the exception of those wells within the PRRS plume south of the FEMP.

The elevated concentrations of nickel detected in filtered and unfiltered samples in South Plume B were within the PRRS plume. The data indicate that the elevated concentrations are due to activities of the PRRS (ERM 1992). Other elevated concentrations of nickel are isolated and only slightly above background, suggesting that nickel is not a major contaminant at the FEMP.

E.2.2.19 Potassium

Potassium in unfiltered samples has a 95th percentile background concentration of 1.96 mg/L and background values that range from 0.648 to 1.96 mg/L (Table E.0-2). Potassium in filtered samples has a 95th percentile background concentration of 3.32 mg/L and background values that range from 0.664 to 4.03 mg/L.

Plate E-123 is a contour map of potassium concentrations in unfiltered groundwater samples from Type 2 wells. Plate E-124 is a contour map of potassium concentrations in unfiltered groundwater samples from Types 3 and 4 wells.

Potassium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 99 of 134 wells (74 percent) and had a maximum concentration of 182 mg/L in Well 2094 which is located within South Plume B (Plate E-123). An area of high concentrations (greater than 30 times background) is present across the PRRS in South Plume B. A second area of high concentrations of potassium is present in the waste storage area A plume.

Isolated occurrences of high concentrations are present in the Plant 6 plume and South Plume B. The high concentration in Well 2754 (21.9 mg/L) is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics.

Potassium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 52 of 77 wells (67 percent) and had a maximum concentration of 268 mg/L in Well 3094 in South Plume B (Table E.2-2). A second area of high concentrations of potassium is present in the waste storage area A plume. The maximum concentration in this area was 19.0 mg/L in Well 3055.

Potassium was detected in unfiltered samples from Type 4 wells at above-background concentrations in 4 of 22 wells (18 percent) and had a maximum concentration of 2.7 mg/L in Well 4014 in South Plume B (Table E.2-3). The other three elevated concentrations were found in isolated wells in the waste storage area A plume and South Plume B.

Potassium was detected in filtered samples from Type 2 wells at above-background concentrations in 24 of 147 wells (18 percent) and had a maximum concentration of 178 mg/L in Well 2094 in South Plume C. Other areas with elevated potassium concentrations in multiple adjacent wells are in South Plume B and the waste storage area A plume.

Potassium was detected in filtered samples from Type 3 wells at above-background concentrations in 7 of 87 wells (9 percent) and had a maximum concentration of 225 mg/L in Well 3094 in South Plume B. Other detections above background were present in the waste storage area A plume and

between the waste storage area B plume and the Plant 6 plume. Potassium was not detected in filtered samples from Type 4 wells at above-background concentrations.

Both filtered and unfiltered samples of groundwater from Type 2 wells indicate a large plume of elevated potassium concentrations near the PRRS. Only a limited number of isolated detections above background are within South Plume B and not within the PRRS plume, suggesting that activities at the PRRS area affected the groundwater in this area. Another plume of high potassium concentrations is present in filtered and unfiltered samples from Type 2, 3, and 4 wells in the waste storage area A plume. The high concentrations of potassium in this area appear to be a result of past site activities at the FEMP.

E.2.2.20 Selenium

Selenium in unfiltered samples has a 95th percentile background concentration of 0.00075 mg/L based on one detection in samples collected to determine background (Table E.0-2). Selenium in filtered samples has a 95th percentile background concentration of 0.004 mg/L and background values that range from 0.00105 to 0.006 mg/L.

Plate E-125 is a contour map of selenium concentrations in unfiltered groundwater samples from Type 2 wells. Selenium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 26 of 134 wells (20 percent) and had a maximum concentration of 0.011 mg/L in Well 2417 in the Plant 6 plume (Table E.2-1). The elevated concentration of 0.0563 mg/L in Well 2754 upgradient of the site is not considered indicative of Great Miami Aquifer conditions and was not used in the data statistics. Elevated detections of selenium are present in each of the site plumes; however, the majority of the elevated concentrations of selenium were at or just above the detection limit. Two wells in South Plume A (0.007 mg/L in Well 2385 and 0.003 mg/L in Well 2045) and two wells east of any known contaminant plume (0.007 mg/L in Well 2733 and 0.003 mg/L in Well 2092) were the only concentrations that notably exceeded the detection limit for selenium.

Selenium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 13 of 77 wells (18 percent) and had a maximum concentration of 0.234 mg/L in Well 3128 in South Plume B (Table E.2-2). The only other high detection of selenium was in Well 3009 which is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics.

Isolated detections of selenium at or just above the detection limit are present within the waste storage area A and B plumes and South Plumes A and C. Selenium was detected in unfiltered samples from Type 4 wells at above-background concentrations in 4 of 22 wells and had a maximum concentration of 0.0028 mg/L in Well 41217 (Table E.2-3).

Selenium was detected in filtered samples from Type 2 wells at above-background concentrations in 3 of 147 wells and had a maximum concentration of 0.011 mg/L in Well 2417 near the sewage treatment plant. Isolated detections of selenium at above-background concentrations are present within waste storage area A plume and South Plumes A and B. Selenium was detected in filtered samples from Type 3 wells at above-background concentrations in 1 of 80 wells and had a maximum concentration of 0.246 mg/L in Well 3128 in South Plume B. Selenium was not detected in filtered samples from Type 4 wells at above-background concentrations.

Selenium was detected infrequently at concentrations above the detection limit in Type 2, 3, and 4 wells in the Great Miami Aquifer. Detections of high concentrations of selenium occurred in isolated wells and nearby wells did not have elevated levels of selenium. The data suggest that selenium is not a major contaminant at the FEMP.

E.2.2.21 Silicon

Silicon in unfiltered samples has a 95th percentile background concentration of 5.81 mg/L based on one detection from samples collected to determine background (Table E.0-2). Silicon in filtered samples has a 95th percentile background concentration of 3.46 mg/L and background values that range from 2.6 to 3.46 mg/L. No contour map for silicon concentrations in groundwater samples from Types 2, 3 or 4 wells is included in this report.

Silicon was detected in unfiltered samples from Type 2 wells at above-background concentrations in 7 of 25 wells (28 percent) and had a maximum concentration of 12.8 mg/L in Well 2944 within South Plume A (Table E.2-1). Detections of silicon at above-background concentrations were also present in multiple adjacent wells in the waste storage area A plume. The data for silicon concentrations in unfiltered samples from Type 3 and 4 wells is very limited. Silicon was detected in unfiltered samples from Type 3 wells at above-background concentrations in 1 of 4 wells (8.83 mg/L in Well 3027) in the waste storage area A plume (Table E.2-2). Silicon was not detected above background in one unfiltered sample collected from a Type 4 well (Table E.2-3).

Silicon was detected in filtered samples from Type 2 wells at above-background concentrations in 76 of 96 wells (79 percent) and had a maximum concentration of 63.4 mg/L in Well 2097, east of any known contaminant plume. Of the 76 detections above background, only Well 2097 and wells in South Plume C had concentrations of silicon greater than two times background.

Silicon was detected in filtered samples from Type 3 wells at above-background concentrations in 26 of 46 wells (57 percent) and had a maximum concentration of 10.9 mg/L in Well 3094 in South Plume C. This was the only detection above two-times-background in filtered samples from Type 3 wells in South Plume C. Two other detections of silicon were greater than two times background. One well in the waste storage area A plume (Well 3027) had a concentration of 8.7 mg/L and one well north of the waste storage area A plume (3678) had a concentration of 7.3 mg/L. Other detections of silicon in filtered samples from Type 3 wells were only slightly above background.

Silicon was detected in filtered samples from Type 4 wells at above-background concentrations in 5 of 6 wells and had a maximum concentration less than two times background (6.43 mg/L in Well 4010) in the waste storage area A plume. Other scattered detections of above-background concentrations were present in Type 4 wells, but were only slightly above background concentrations.

The data for silicon concentrations in unfiltered samples from the Great Miami Aquifer are limited, making it difficult to draw any conclusions on concentration trends. The data from filtered and unfiltered samples from Type 2 wells suggest plumes of silicon in South Plumes A, B, and C, in the waste storage area A plume, and in the Plant 6 plume. However, these elevated concentrations are only approximately two times background or less. Only the elevated concentrations of silicon in South Plume C are greater than two times background. These detections are within the PRRS plume. The data from filtered samples in Type 3 and 4 wells indicates only three isolated wells with concentrations greater than two times background. These data indicate that silicon does not occur at high concentrations in the Great Miami Aquifer, except in isolated occurrences, and is not a major contaminant at the FEMP.

E.2.2.22 Silver

Silver in unfiltered samples has a 95th percentile background concentration of 0.0117 mg/L based on one detection in 16 samples collected to determine background. Silver in filtered samples has a 95th

percentile background concentration of 0.0138 mg/L and background values that range from 0.0031 to 0.034 mg/L (Table E.0-2).

Plate E-126 is a contour map of silver concentrations in unfiltered groundwater samples from Type 2 wells. Silver was not detected in unfiltered samples from 135 Type 2 wells at above-background concentrations (Table E.2-1). Silver was detected in unfiltered samples from Type 3 wells at above-background concentrations in 2 of 78 wells at concentrations of 0.0799 mg/L in Well 3128 in South Plume B and 0.071 mg/L in Well 3005 in the waste storage area A plume (Table E.2-2). An elevated detection in Well 3009 is not considered indicative of the Great Miami Aquifer and was not included in the data statistics.

Silver was detected in unfiltered samples from Type 4 wells at above-background concentrations in 1 of 22 wells at a concentration of 0.023 mg/L in Well 4125 in South Plume B (Table E.2-3). This well is within the PRRS plume.

Silver was detected in filtered samples from Type 2 wells at above-background concentrations in 9 of 147 wells (6 percent) and had a maximum concentration of 0.12 mg/L in Well 2129 in South Plume B. Well 2129 is also in the PRRS plume, as are all the other Type 2 wells with elevated concentrations of silver in filtered samples.

Silver was detected in filtered samples from Type 3 wells at above-background concentrations in 2 of 78 wells and had a maximum concentration of 0.0857 mg/L in Well 3128 in the South Plume B. This well is within the PRRS plume. The other detection of silver at an above-background concentration was also within the PRRS plume. An elevated detection in Well 3009 is not considered indicative of the Great Miami Aquifer and was not included in the data statistics. Silver was detected in filtered samples from Type 4 wells at above-background concentrations in 1 of 22 wells at a concentration of 0.0232 mg/L in Well 4125, within the PRRS plume.

Elevated concentrations of silver in groundwater samples from the Great Miami Aquifer, with only one exception, were all found in the PRRS plume. This suggests that observed impacts on the silver concentrations in the Great Miami Aquifer are a result of site activities at the PRRS.

E.2.2.23 Sodium

Sodium in unfiltered samples has a 95th percentile background concentration of 47.2 mg/L and background values that range from 3.08 to 50.4 mg/L (Table E.0-2). Sodium in filtered samples has a 95th percentile background concentration of 55 mg/L and background values that range from 1.96 to 101 mg/L.

Plate E-127 is a contour map of sodium concentrations in unfiltered groundwater samples from Type 2 wells. Plate E-128 is a contour map of sodium concentrations in unfiltered groundwater samples from Types 3 and 4 wells.

Sodium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 11 of 134 wells (9 percent) and had a maximum concentration of 130 mg/L in Well 2129 in South Plume B (Table E.2-1). The elevated detection of 183 mg/L in Well 2754 upgradient of the site is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Areas of elevated concentrations of sodium were found either South Plumes B and C and in the waste storage area A plume. All detections above background in South Plumes B and C were also in the PRRS plume.

Sodium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 8 of 78 wells (11 percent) and had a maximum concentration of 294 mg/L in Well 3066 in the Shandon Trough upgradient of the FEMP (Table E.2-2). All wells exhibiting detections of sodium above background concentrations in unfiltered samples from Type 3 wells were within, just upgradient or just to the east of the waste storage area A plume.

Sodium was detected in unfiltered samples from Type 4 wells at above-background concentrations in 1 of 24 wells (5 percent) at a concentration of 74.6 mg/L in Well 4424. This well is east of the waste storage area A plume. An elevated concentration of 84.2 mg/L in Well 4013 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics (Table E.2-3).

Sodium was detected in filtered samples from Type 2 wells at above-background concentrations in 8 of 146 wells (5 percent) and had a maximum concentration of 118 mg/L in Well 2028 in the waste storage area A plume; four of the seven detections were in this plume. Other above-background

detections are one well in South Plume B, one in South Plume C, and one north of the waste storage area A plume.

Sodium was detected in filtered samples from Type 3 wells at above-background concentrations in 6 of 80 wells (8 percent) and had a maximum concentration of 321 mg/L in Well 3066 in the Shandon Trough upgradient of the FEMP. Sodium was detected in filtered samples from Type 4 wells at above-background concentrations in 1 of 22 wells at a concentration of 71.5 mg/L in Well 4424, east of the waste storage area A plume. An elevated concentration of 77.8 mg/L in Well 4013 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics (Table E.2-3). All wells exhibiting detections of sodium above background concentrations in filtered samples from Types 3 and 4 wells were within, just upgradient or just to the east of the waste storage area A plume.

The elevated concentrations of sodium in both filtered and unfiltered groundwater samples from Type 2 wells in South Plumes B and C are all within the PRRS plume. These elevated concentrations are attributable to the PRRS area (ERM 1992).

The large area of elevated concentrations of sodium found in both filtered and unfiltered data from Type 3 and 4 wells in the waste storage area A plume and upgradient of this plume may represent water with a high sodium concentration flowing out of the Shandon Trough and into the FEMP area. The concentrations in Type 2 wells of the Operable Unit 1 waste pit area and Operable Unit 2 solid waste landfill may represent the same area of high sodium concentrations as is presented in the Type 3 and 4 well data. These data may indicate elevated sodium concentrations which are due to past site activities at the FEMP; however, the extent and pattern of high sodium values on the north edge of the site are probably a natural part of the groundwater that flows into the Great Miami Aquifer from the Shandon Trough, and subsequently flows east as a component of the Great Miami Aquifer.

E.2.2.24 Thallium

Thallium was not detected in filtered or unfiltered samples collected to determine background; consequently, any detection of thallium is potentially an above-background concentration (Table E.0-2).

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Plate E-129 is a contour map of thallium concentrations in unfiltered groundwater samples from Type 2 wells. Thallium was detected in unfiltered samples from Type 2 wells in 1 of 133 wells at a concentration of 0.0011 mg/L in Well 2648, which is located in the waste storage area A plume (Table E.2-1).

Thallium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 1 of 77 wells at a concentration of 0.057 mg/L in Well 3128 in South Plume B (Table E.2-3). An elevated concentration of 0.0895 mg/L in Well 3009 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics. Thallium was not detected in groundwater samples from 21 Type 4 wells (Table E.2-3).

Thallium was detected in filtered samples from Type 2 wells at above-background concentrations in 1 of 135 wells at a concentration of 0.022 mg/L in Well 2034 in the waste storage area B plume. Thallium was detected in filtered samples from Type 3 wells at above-background concentrations in 1 of 74 wells at a concentration of 0.058 mg/L in Well 3128 in South Plume B (Table E.2-3). An elevated concentration of 0.094 mg/L in Well 3009 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics. Thallium was not detected in 20 Type 4 wells sampled (Table E.2-3).

Thallium was detected in only two isolated Type 2 wells and in only one Type 3 well, suggesting that thallium is not a major contaminant at the FEMP.

E.2.2.25 Vanadium

Vanadium in unfiltered samples has a 95th percentile background concentration of 0.0117 mg/L and background values that range from 0.0076 to 0.0117 mg/L (Table E.0-2). Vanadium in filtered samples has a 95th percentile background concentration of 0.0234 mg/L and background values that range from 0.01 to 0.0244 mg/L.

Plate E-130 is a contour map of vanadium concentrations in unfiltered groundwater samples from Type 2 wells. Vanadium was detected in unfiltered samples from Type 2 wells at above-background concentrations in 6 of 133 wells and had a maximum concentration of 0.251 mg/L in Well 2548 in South Plume B (Table E.2-1). An elevated concentration of 0.361 mg/L detected in Well 2754 is not considered representative of Great Miami Aquifer conditions and was not included in the data

statistics. One isolated detection at an above-background concentration was detected in South Plume A. The other four detections above background were in South Plume B.

Vanadium was detected in unfiltered samples from Type 3 wells at above-background concentrations in 1 of 76 wells at a concentration of 0.28 mg/L in Well 3128 in South Plume B (Table E.2-2). A detection above background in Well 3009 is not considered indicative of Great Miami Aquifer conditions and was not included in the data statistics. Vanadium was not detected in unfiltered samples from 22 Type 4 wells at above-background concentrations (Table E.2-3).

Vanadium was detected in filtered samples from Type 2 wells at above-background concentrations in 1 of 139 wells at a concentration of 0.0823 mg/L in Well 2129 in South Plume B. Vanadium was detected in filtered samples from Type 3 wells at above-background concentrations in 1 of 76 wells at a concentration of 0.282 mg/L in Well 3128 in South Plume B. Vanadium was not detected in the 21 Type 4 wells sampled (Table E.2-3).

The only detections of vanadium at above-background concentrations were in South Plume B, with the exception of one well in South Plume A. The detections in South Plume B were all also within the PRRS plume and may be a result of activities at the PRRS area. The data indicate that vanadium is not a major contaminant at the FEMP.

E.2.2.26 Zinc

Zinc in unfiltered samples has a 95th percentile background concentration of 0.021 mg/L and background values that range from 0.0087 to 0.021 mg/L (Table E.0-2). Zinc in filtered samples has a 95th percentile background concentration of 0.0568 mg/L and background values that range from 0.0068 to 0.133 mg/L.

Plate E-131 is a contour map of zinc concentrations in unfiltered groundwater samples from Type 2 wells. Zinc was detected in unfiltered samples from Type 2 wells at above-background concentrations in 23 of 134 wells (17 percent) and had a maximum concentration of 1.120 mg/L in Well 2548 in South Plume B (Table E.2-1). An elevated concentration of 1.18 mg/L in Well 2754 upgradient of the site is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics. Other isolated high detections of zinc were present in the waste storage area A plume, South Plumes A and B, and the Plant 6 plume.

Zinc was detected in unfiltered samples from Type 3 wells at above-background concentrations in 10 of 78 wells and had a maximum concentration of 0.126 mg/L in well 3126 in South Plume B (Table E.2-2). An elevated concentration of 0.282 mg/L in Well 3009 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics. Isolated detections above background were also present in the waste storage area A and B plumes, and three wells east of any known contaminant plumes.

Zinc was detected in unfiltered samples from Type 4 wells at above-background concentrations in 1 of 21 wells at a concentration of 0.0474 mg/L in Well 4015 in South Plume B. (Table E.2-3).

Zinc was detected in filtered samples from Type 2 wells at above-background concentrations in 2 of 138 wells at concentrations of 0.0976 mg/L in Well 2060 in South Plume B and 0.074 mg/L in Well 2118 in the Plant 6 plume. Zinc was detected in filtered samples from Type 3 wells at above-background concentrations in 1 of 75 wells at a concentration of 0.122 mg/L in Well 3128 in South Plume B (Table E.2-3). An elevated concentration of 0.311 mg/L in Well 3009 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics. Zinc was detected in filtered samples from Type 4 wells at above-background concentrations in 1 of 20 wells at a concentration of 0.0766 mg/L in Well 41066 in the waste storage area A plume.

Elevated concentrations of zinc were detected in both filtered and unfiltered samples from Type 3 wells in South Plume B. The elevated detections in the PRRS plume are probably attributable to the PRRS (ERM 1992). However, the elevated detections north of the PRRS plume are probably a result of site activities at the FEMP. The elevated concentrations of zinc in wells in South Plume A, waste storage area A and B plumes, and the Plant 6 plume may be a result of past site activities at the FEMP, but the detections are isolated and at low concentrations, suggesting that zinc is not a major contaminant at the FEMP.

E.2.3 ORGANIC PARAMETERS

E.2.3.1 Volatile Organic Compounds

VOCs are a class of organic compounds that include many solvents and agents used at the FEMP. VOCs are generally not present in nature at detectable concentrations and were not analyzed for in background samples; therefore, any positive detection of a VOC is considered to be an above-

background concentration. Tables E.2-1, E.2-2 and E.2-3 present summary statistics for individual VOCs detected in the Great Miami Aquifer.

Plates E-132 and E-133 are isoconcentration maps of total VOC concentrations in Type 2, and Type 3 and Type 4 wells, respectively, based on 1993 data. The concentration shown for each well is the maximum sum of individual VOC concentrations present in a groundwater sample from that well.

In the 1993 data from Type 2 wells (Plate E-132), total VOCs were detected in numerous wells south of the PRRS; the plume defined by these data is attributed to PRRS.

In unfiltered groundwater samples VOCs were detected in 60 of 149 Type 2 wells (40 percent). Elevated concentrations of VOCs were observed in all of the FEMP plumes. The maximum concentration was observed in Well 2544 (1095 μg/L), in South Plume B. The highest concentration of total VOCs in the waste storage area A plume is in Well 2649 (278 μg/L).

VOCs were detected in unfiltered groundwater samples in 28 of the 85 Type 3 wells (33 percent). The maximum concentration was observed in the Plant 6 plume in Well 3120 (300.8 μg/L). VOCs were also detected in 9 of 24 Type 4 wells; Well 4096 had the maximum concentration of 96.0 μg/L. The highest detection observed was in the waste storage area A plume in Well 4011 (38.9 μg/L).

Detections of total VOCs in the waste storage area A plume, the Plant 6 plume, South Plume A and South Plume B are believed to be isolated occurrences attributable to the FEMP. Many low-level detections less than 5 μg/L total VOC may be due to sample contamination.

E.2.3.2 Semivolatile Organic Compounds

Semivolatile organic compounds (semivolatiles) are a class of organic compounds characterized by high molecular weight and low vapor pressure, such as polynuclear aromatic hydrocarbons and phenols. Semivolatiles are in general not found naturally in groundwater at detectable concentrations and semivolatiles were not analyzed for in background samples; consequently, any detection is considered to potentially be an above-background concentration.

Semivolatiles were detected at low levels in unfiltered groundwater samples from Type 2, Type 3, and Type 4 wells. Tables E.2-1, E.2-2, and E.2-3 present summary statistics of analyses for

individual semivolatile organic compounds. The majority of the semivolatiles detected in unfiltered samples from the Great Miami Aquifer were phthalates, which are common laboratory and/or sampling contaminants. The maximum concentration of semivolatiles was observed in Well 2095 (172.0 μg/L) in South Plume B.

Because phthalates were not believed to be used at the FEMP, they are not considered to a be contaminant in the Great Miami aquifer.

E.2.3.3 Total Pesticides

Background samples collected from Type 2, 3, and 4 wells were not analyzed for pesticides and PCBs; therefore, any detection is considered to potentially be an above-background concentration.

Analysis of unfiltered groundwater samples detected pesticides in 2 of 78 Type 2 wells (3 percent). Well 2423 (2.75 μg/L) in the waste storage area A plume had the maximum concentration of total pesticides. The pesticides detected in the well were endosulfan-II and endosulfan sulfate at concentrations of 0.15 μg/L and 2.6 μg/L, respectively. Another isolated detection of total pesticides was observed in the waste storage area A plume in Well 2022 (0.18 μg/L).

Pesticides were detected in 1 of 28 Type 3 wells (4 percent). An isolated detection of total pesticides was measured in South Plume B in Well 3069 (0.041 μg/L). The pesticides detected in the groundwater from this well were dieldrin and endosulfan-I at concentrations of 0.016 μg/L and 0.025 μg/L, respectively.

Unfiltered groundwater samples from nine Type 4 wells at the FEMP were analyzed for pesticides; none were detected.

E.2.3.4 Total Dioxins and Furans

Background samples collected from Type 2, 3, and 4 wells were not analyzed for dioxins and furans; therefore, any detection is considered to potentially be an above-background concentration.

In unfiltered groundwater, elevated dioxins and furans concentrations were detected in 3 of 16 Type 2 wells (19 percent). The maximum concentration of total dioxins and furans was observed in the South Plume C in Well 2094 (2.9 nanograms/liter ng/L). Well 2094 is also located within the PRRS

plume. Two isolated elevated concentrations were observed in the waste storage area A plume in Well 2821 (0.7 ng/L) and Well 2037 (0.91 ng/L).

Total dioxins and furans were detected in 1 of 5 Type 3 wells sampled. Well 3037 had a concentration of 5.33 ng/L of total dioxins. This well is located in the waste storage area A plume and had detectable concentrations of pentachlorodibenzofurans, tetrachlorodibenzo-p-dioxins, and tetrachlorodibenzofurans (Table E.2-1).

Dioxins and furans were not detected in samples from one Type 4 well.

E.2.3.5 Total Herbicides

Unfiltered groundwater samples were collected from 16 Type 2, 12 Type 3, and 6 Type 4 wells at the FEMP; herbicides were not detected in any groundwater samples.

E.2.3.6 Organophosphorus Pesticides

Unfiltered groundwater samples were collected from 25 Type 2, 12 Type 3, and 6 Type 4 wells at the FEMP; organophosphorus pesticides were not detected in any groundwater samples.

E.2.4 GENERAL WATER QUALITY PARAMETERS

E.2.4.1 Alkalinity

Alkalinity is formally defined as the equivalent sum of bases that are titratable with strong acid (Stumm and Morgan 1981). Alkalinity in the Great Miami Aquifer was determined as total calcium carbonate. The alkalinity values in Type 2 wells ranged from 188 to 484 mg/L in the 1993 data set (Table E.2-1) Plate E-135 is a contour map of alkalinity in Type 2 wells based on the 1993 data set. On the basis of trends shown, there is an apparent increase in alkalinity in the waste storage area A plume, South Plume A, and the PRRS plume.

The alkalinity values in Type 3 wells ranged from 206 to 548 mg/L in the 1993 data set (Table E.2-2). The alkalinity values in Type 4 wells ranged from 230 to 482 mg/L (Table E.2-3). The data from Types 3 and 4 wells indicate that alkalinity is elevated along the northern edge of the Great Miami Aquifer. The extent and pattern of high alkalinity suggests that water with higher alkalinity is flowing out of the Shandon Trough. The groundwater from the Shandon Trough flows into the Great Miami Aquifer and flows east as a component of the Great Miami Aquifer.

E.2.4.2 Ammonia

Ammonia has a 95th percentile background concentration of 4.2 mg/L and background values that range from 0.045 to 12.6 mg/L (Table E.0-2). Plate E-136 is a contour map of ammonia concentrations in groundwater samples from Type 2 wells. Ammonia was detected in samples from 4 of 154 Type 2 wells at above-background concentrations based on the 1993 data set (Table E.2-1). Ammonia is present at elevated concentrations in two wells in the waste Storage Area A plume (17.0 mg/L in Well 2643 and 10.0 mg/L in Well 2022) and Well 2679 (6.24 mg/L) upgradient of the site.

Ammonia was detected in samples from Type 3 wells at above-background concentrations in 4 of 84 wells (5 percent) and had a maximum concentration of 25 mg/L in Well 3066 upgradient of the site (Table E.2-2). An elevated concentration of ammonia in Well 3009 is not considered indicative of the Great Miami Aquifer and was not included in the data statistics. Ammonia was detected in samples from Type 4 wells at above-background concentrations in 1 of 24 wells at a concentration of 4.56 mg/L in Well 4424 (Table E.2-3). Plate E-137 is a contour map of ammonia concentrations in Type 3 and 4 wells based on the 1993 data set.

The data indicate that groundwater upgradient of the site in the Shandon Trough has higher ammonia concentrations than the remainder of the Great Miami Aquifer. The extent and pattern of high concentrations suggest that water with high ammonia concentrations flows out of the Shandon Trough. The groundwater from the Shandon Trough flows into the Great Miami Aquifer and flows east as a component of the Great Miami Aquifer. However, the elevated concentrations of ammonia evident in groundwater samples from Type 2 wells in the waste storage Area A plume may be a result of site activities.

E.2.4.3 Chloride

Chloride has a 95th percentile background concentration of 73 mg/L and background values that ranged from 0.02 to 120 mg/L (Table E.0-2). Plate E-138 is a contour map of chloride concentrations in groundwater samples from Type 2 wells. Chloride was detected at above-background concentrations in samples from 12 of 156 Type 2 wells and had a maximum concentration of 340 mg/L in Well 2028 in the waste storage area A plume (Table E.2-1). Chloride is present at elevated concentrations in multiple adjacent wells in the waste storage area A plume.

Chloride was detected in samples from Type 3 wells at above-background concentrations in 9 of 84 wells and had a maximum concentration of 750 mg/L in Well 3066 upgradient of the site (Table E.2-2). Chloride was detected in samples from Type 4 wells at above-background concentrations in 3 of 24 wells and had a maximum concentration of 190 mg/L in Well 41217 (Table E.2-3). All three of these wells are northeast of the production area.

The data indicate that groundwater upgradient of the site in the Shandon Trough has higher chloride concentrations than the remainder of the Great Miami Aquifer. The extent and pattern of high concentrations suggest that water with high chloride concentrations flows out of the Shandon Trough. The groundwater from the Shandon Trough flows into the Great Miami Aquifer and flows east as a component of the Great Miami Aquifer. However, the elevated concentrations of chloride evident in groundwater samples from Type 2 wells in the waste storage area A plume may be a result of site activities.

E.2.4.4 Fluoride

Fluoride has a 95th percentile background concentration of 0.89 mg/L and background values that ranged from 0.1 to 1.9 mg/L (Table E.0-2). Fluoride was detected at above-background concentrations in samples from 3 of 155 Type 2 wells and had a maximum concentration of 1.36 mg/L in Well 2649 in the waste storage area A plume (Table E.2-1). The maximum concentration is less than two times background and is within the range of background values. Fluoride was not detected in samples from Type 3 or 4 wells at above-background concentrations (Tables E.2-2 and E.2-3).

The limited number above-background detections and the low concentrations indicate that fluoride concentrations in the Great Miami Aquifer have not been affected by past site activities.

E.2.4.5 Nitrate

Nitrate has a 95th percentile background concentration of 11.4 mg/L and background values that range from 0.014 to 24.9 mg/L (Table E.0-2). Plate E-139 is a contour map of nitrate concentrations in groundwater samples from Type 2 wells. Nitrate was detected in groundwater samples at above-background concentrations from 7 of 139 Type 2 wells and had a maximum concentration of 79.4 mg/L in Well 2028 in the waste storage area A plume (Table E.2-1), all seven elevated detections were in this plume.

Nitrate was not detected at above-background concentrations in samples from Type 3 or 4 wells (Tables E.2-2 and E.2-3). Plate E-140 is a contour map of nitrate concentrations in groundwater samples from Type 3 and 4 wells.

The elevated concentrations of nitrate in the waste storage area A plume suggest that past site activities at the FEMP have affected nitrate concentrations in the Great Miami Aquifer in this area.

E.2.4.6 pH

The pH of a water is defined as the negative log of the hydrogen ion concentration. The pH scale ranges from 0 to 14 standard pH units with 7 being a neutral pH value. Acidic waters have lower pH values and basic waters have higher pH values. The pH measurements were collected in the field with portable instruments during groundwater sample collection. No background value was determined for pH.

The pH values of groundwater samples from Type 2 wells ranged from 6.97 to 8.16 (Table E.2-1). There was only one pH value below 7 and two isolated pH values above 8. Plate E-141 is a contour map of pH values in unfiltered samples from Type 2 wells based on the 1993 data set. The pH values of groundwater samples from Type 3 wells ranged from 7.1 to 8.2 (Table E.2-2). There were three values of pH above 8 in samples from Type 3 wells which lie along Paddys Run. The pH values of groundwater samples from Type 4 wells ranged from 7.43 to 8.05 (Table E.2-3). There was only one measurement of pH above 8, which was east of any known contaminant plume.

The limited number of pH values above 8 or below 7 suggest that the pH of the Great Miami Aquifer has not been affected by past site activities at the FEMP. Only the slightly elevated pH values in groundwater samples from Type 3 wells along Paddys Run could be a result of past site activities.

E.2.4.7 Total Phenols

Total phenols have a 95th percentile background concentration of 0.03 mg/L and background values that ranged from 0.00575 to 0.091 mg/L (Table E.0-2). Plate E-142 is a contour map of total phenol concentrations in unfiltered groundwater samples from Type 2 wells.

Total phenols were detected at above-background concentrations in groundwater samples from 1 of 155 Type 2 wells at a concentration of 0.072 mg/L in Well 2383, which is west of any known

contaminant plume (Table E.2-1). This concentration is less than three times background and is within the range of background concentrations. Total phenols were detected in groundwater samples at above-background concentrations from 1 of 84 Type 3 wells at a concentration of 0.033 mg/L in Well 3018 in the waste storage area B plume (Table E.2-2). This concentration is only slightly above background. Total phenols were not detected at above-background concentrations in groundwater samples from 24 Type 4 wells (Table E.2-3).

The limited number of elevated detections of total phenols and the low concentrations do not indicate that the concentration of total phenols in the Great Miami Aquifer have been affected by past site activities at the FEMP.

E.2.4.8 Phosphorous

Phosphorous has a 95th percentile background concentration of 0.954 mg/L and background values that ranged from 0.01 to 3.08 mg/L (Table E.0-2). Plate E-143 is a contour map of phosphorus concentrations in unfiltered groundwater samples from Type 2 wells. Phosphorus was detected in groundwater samples at above-background concentrations from 14 of 156 Type 2 wells and had a maximum concentration of 170 mg/L in Well 2636 in South Plume B (Table E.2-1). The highest concentrations of phosphorus were found in multiple adjacent wells in South Plume B. All of these elevated concentrations of phosphorus were detected in wells which are in the PRRS plume. These elevated detections are attributed to the PRRS (PRRS 1992). Only isolated detections of phosphorus at much lower concentrations were found outside of the PRRS Plume.

Phosphorus was detected in groundwater samples from Type 3 wells at above-background concentrations in 4 of 85 wells and had a maximum concentration of 306.0 mg/L in Well 3092, east of any known contaminant plume (Table E.2-2). The elevated detection of phosphorus in Well 3009 is not considered representative of Great Miami Aquifer conditions and was not included in the data statistics. Phosphorus was not detected in groundwater samples from Type 4 wells at above-background concentrations (Table E.2-3).

The isoconcentration map does not indicate plumes of elevated phosphorus concentrations outside of the PRRS plume.

E.2.4.9 Specific Conductivity

Specific conductivity is a measure of the ability of a solution to conduct an electric current and it is directly related to the waters ionic content. It is a relative measure of total dissolved solids in the water. Specific conductivity is reported in units of reciprocal ohms per centimeter (μmhos/cm). Specific conductivity measurements in Type 2 wells of the 1993 data set ranged from 424 μmhos/cm to a maximum of 3400 μmhos/cm (Table E.2-1). Plate E-144 is a contour map of specific conductivity values in unfiltered samples from Type 2 wells. Specific conductivity measurements in Type 3 wells ranged from 370 to 2600 μmhos/cm (Table E.2-2). Specific conductivity measurements in Type 4 wells ranged from 470 to 1840 μmhos/cm (Table E.2-3).

Plate E-145 is a contour map of specific conductivity values in unfiltered samples from Types 3 and 4 wells. Most on-property wells measured between approximately 700 and 1000 μmhos/cm. Specific conductivity trends in Type 2 wells indicate areas of elevated specific conductivity originating from the Plant 6 Plume and South Plumes A and B.

The data indicate that groundwater upgradient of the site in the Shandon Trough has higher specific conductivity than the remainder of the Great Miami Aquifer. The extent and pattern of high specific conductivity suggest that water with higher specific conductivity is flowing out of the Shandon Trough. The groundwater from the Shandon Trough flows into the Great Miami Aquifer and flows east as a component of the Great Miami Aquifer.

E.2.4.10 Sulfate

Sulfate has a 95th percentile background concentration of 197 mg/L and background values that range from 2.79 to 321 mg/L (Table E.0-2). Plate E-146 is an isoconcentration map of sulfate in Type 2 wells based on 1993 data. Sulfate was detected at concentrations above background in 22 of 155 Type 2 wells (14 percent) (Table E.2-1). Elevated detections in multiple adjacent wells were observed in the Plant 6 and waste storage area A plume. The maximum concentration was detected in Well 2109 (740.0 mg/L).

Sulfate was detected at above-background concentrations in 8 of 84 Type 3 wells (10 percent), with a maximum detection of 520 mg/L (Table E.2-2). Elevated concentrations of sulfate were detected in 1 of 24 Type 4 wells (4 percent); the maximum detected concentration was 224 mg/L in Well 41217,

east of any known contaminant plume. (Table E.2-3). Plate E-147 is an isoconcentration map of sulfate in Type 3 and 4 wells.

The magnitude of the elevated concentrations of sulfate in the Plant 6, and waste storage area A plumes suggest that the Great Miami Aquifer groundwater quality has been adversely affected by site activities involving the use of sulfate sources such as sulfuric acid.

E.2.4.11 Total Organic Carbon

Total organic carbon (TOC) measures the concentration of all organic compounds present in the groundwater. The TOC analysis detects humic and fulvic acids commonly found in groundwater.

TOC has a 95th percentile background concentration of 2.23 mg/L and background values that range from 1.0 to 4.25 mg/L (Table E.0-1). Plate E-148 is an isoconcentration map of TOC in Type 2 wells. TOC was detected at above-background concentrations in 23 of 146 Type 2 wells (16 percent); the maximum concentration was observed in South Plume C in Well 2094 at 49 mg/L (Table E.2-1).

Plate E-149 is an isoconcentration map of TOC in Type 3 and 4 wells. Elevated TOC was detected in 18 of 80 Type 3 wells (23 percent). The maximum concentration of 140 mg/L was observed in the Plant 6 plume in Well 3064 (Table E.2-2). Five of 23 Type 4 wells (22 percent) had elevated detections of TOC with a maximum concentration of 9 mg/L in Well 4398 (Table E.2-3).

Elevated detections of TOC in multiple adjacent Type 2 and Type 3 wells in the Great Miami Aquifer suggest that groundwater quality has been affected by site activities.

E.2.4.12 Total Organic Halogens

The total organic halogens (TOX) analysis is a measurement of the concentration of all halogenated organic compounds present in groundwater. TOX has a 95th percentile background concentration of 0.052 mg/L and background values that range from 0.012 to 0.12 mg/L (Table E.0-2).

Plate E-150 is an isoconcentration map of TOX in Type 2 wells based on the 1993 data set. TOX was detected at above-background concentrations in 10 of 152 Type 2 wells (7 percent). Two isolated detections with concentrations two times background were observed (Table E.2-1), one in South

Plume B in Well 2391 (0.110 mg/L) and one in Well 2050 (0.120 mg/L), which is located outside the FEMP Great Miami Aquifer plumes.

TOX was detected at above-background concentrations in 6 of 83 Type 3 wells (7 percent). The maximum detection was 0.210 mg/L (Table E.2-2) in Well 3679 upgradient of the site. TOX was detected at above-background concentrations in 1 of 24 Type 4 wells (17 percent), with a maximum concentration of 0.067 mg/L (Table E.2-3) in Well 4011 in the waste storage area A plume.

Five wells in the Great Miami Aquifer had isolated concentrations of TOX that were greater than or equal to two times the background concentration. This would suggest that site activities may have affected the TOX concentrations in the groundwater. However, due to the low number of elevated detections, they may only represent natural variability in the background concentration.

E.2.4.13 Total Organic Nitrogen

The total organic nitrogen (TON) analysis detects nitrogen present in forms such as ammonia and amines, but does not detect nitrogen present in groundwater as nitrate or nitrite.

TON has a 95th percentile background concentration of 0.9 mg/L and background values that ranged from 0.075 to 2.75 mg/L (Table E.0-2). TON was detected in unfiltered groundwater samples at above-background concentrations in 7 of 152 Type 2 wells (5 percent); the maximum concentration was detected in Well 2549 in South Plume B at 3.15 mg/L (Table E.2-1). Plate E-151 is an isoconcentration map of TON in Type 2 wells based on the 1993 data set.

An elevated concentration of TON was detected in 1 of 82 Type 3 wells (1 percent) at a concentration of 3.2 mg/L (Table E.2-2). Elevated concentrations of TON were not detected in 24 Type 4 wells sampled (Table E.2-3).

Five isolated, above-background detections of TON were observed in groundwater samples from the Great Miami Aquifer. Two of these were located within waste storage area A plume, one in the South Plume A, and two in South Plume B. The proximity of the well locations to known sources suggests that the elevated concentrations of TON are a result of site activities.

E.2.4.14 Total Kjeldahl Nitrogen

The total Kjeldahl nitrogen (TKN) analysis measures nitrogen in the tri-negative valance state after ammonia has been removed. The measurement will detect nitrogen compounds such as amines, but it will not detect nitrogen present in groundwater as nitrate, nitrite or ammonia. Tables E.2-1, E.2-2, and E.2-3 present the summary statistics for Great Miami Aquifer groundwater based on the 1993 data set.

TKN has a 95th percentile background concentration of 3.30 mg/L in unfiltered groundwater and with background values that range from 0.1 to 4.74 mg/L (Table E.0-2).

Plate E-152 is an isoconcentration map of TKN in Type 2 wells. TKN was detected at above-background concentrations in 7 of 136 Type 2 wells (5 percent). The maximum concentration was detected in the waste storage area A plume in Well 2022 at 8.5 mg/L (Table E.2-1).

Four of 76 Type 3 wells (5 percent) contained concentrations of TKN at above-background levels (Table E.2-2). The maximum concentration in Type 3 well samples was also observed in the waste storage area A plume (Well 3037, 27 mg/L). Elevated concentrations of TKN were detected in groundwater samples collected from 2 of 21 Type 4 wells (9 percent) with a maximum concentration of 4.63 mg/L (Table E.2-3).

All elevated concentrations of TKN in Type 2, 3, and 4 wells were detected in samples from isolated wells. Only two wells yielded TKN concentrations greater than two times background. The elevated concentrations of TKN are most likely due to naturally occurring variability in the background concentration.

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	106/129	77/129	1.4	.24 - 381	.2 - 1	0.9
URANIUM-238	pCi/L	UNF	114/156	96/156	1.3	.3 - 707	.2 - 3.4	0.64
URANIUM, TOTAL	ug/L	FIL	127/135	108/135	4.1	.2 - 1129	.1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	159/171	129/171	3.5	.2 - 2070	.1 - 1	1.2
URANIUM-234	pCi/L	FIL	105/128	79/128	1.5	.27 - 357.5	.2 - 1	0.9
URANIUM-234	pCi/L	UNF	121/156	93/156	1.4	.268 - 662	.2 - 3.4	0.8
THORIUM-230	pCi/L	FIL	19/127	18/127	-	.253 - 3.08	.2 - 1	0.29
THORIUM-230	pCi/L	UNF	66/158	10/158	-	.211 - 2.85	.2 - 1.72	0.89
RADIUM-226	pCi/L	FIL	20/127	4/127	-	1.1 - 4.1	.6 - 1.2	1.9
RADIUM-226	pCi/L	UNF	22/158	0/158	-	1.1 - 14.9	.5 - 2	105
LEAD-210	pCi/L	FIL	0/1	0/1	-		3 - 3	NA
URANIUM-235/236	pCi/L	FIL	25/128	25/128	-	.24 - 15.7	.1 - 1	ND
URANIUM-235/236	pCi/L	UNF	31/156	31/156	-	.22 - 31.7	.1 - 3.4	0.094
THORIUM-232	pCi/L	FIL	11/127	11/127	-	.3 - 2.7	.2 - 1	0.3
THORIUM-232	pCi/L	UNF	13/158	13/158	-	.3 - 2.7	.2 - 1.1	0.23
THORIUM, TOTAL	ug/L	FIL	38/80	7/80	-	0 - 9.12	.5 - 13	2.8
THORIUM, TOTAL	ug/L	UNF	57/140	33/140	-	0 - 24.6242	.5 - 10	0.97
RADIUM-228	pCi/L	FIL	0/129	0/129	-		1.3 - 5.65	ND
RADIUM-228	pCi/L	UNF	11/158	8/158	-	3.1 - 5.3	1.2 - 3.4	3.6
THORIUM-228	pCi/L	FIL	17/127	9/127	-	.21 - 2.55	.1 - 1	0.4
THORIUM-228	pCi/L	UNF	18/158	10/158	-	.3 - 1.97	.1 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	3/51	2/51	-	0 - 2.5	.5 - 1.1	0.12
NEPTUNIUM-237	pCi/L	UNF	4/123	4/123	-	0 - .7963	.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/63	0/63	-		.5 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	3/138	3/138	-	.9 - 1.4	.0431 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	1/64	1/64	-	.89 - .89	.5 - 1	ND
PLUTONIUM-238	pCi/L	UNF	1/138	1/138	-	.637 - .637	.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	4/61	4/61	-	1.17 - 5.69	.5 - 6.98	ND
STRONTIUM-90	pCi/L	UNF	11/137	11/137	-	1.37 - 32.3	.5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	7/70	7/70	-	19.2 - 204	12 - 30	ND
TECHNETIUM-99	pCi/L	UNF	12/140	12/140	-	17.8 - 2110	13.5 - 34.3	ND
RUTHENIUM-106	pCi/L	FIL	0/52	0/52	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/124	0/124	-		150 - 168	ND
CESIUM-137	pCi/L	FIL	0/60	0/60	-		4 - 20	ND
CESIUM-137	pCi/L	UNF	1/137	1/137	-	20 - 20	4 - 21.9	ND
GROSS ALPHA	pCi/L	FIL	64/124	64/124	-	2.2 - 553	0 - 12.9	NA
GROSS ALPHA	pCi/L	UNF	88/140	88/140	5.8	1.6 - 1410	0 - 620	NA
GROSS BETA	pCi/L	FIL	93/124	93/124	7.4	.6 - 488	0 - 10,2	NA
GROSS BETA	pCi/L	UNF	107/140	107/140	8.3	.6 - 1080	.7 - 28	NA
RADIUM, TOTAL	pCi/L	UNF	4/4	4/4	1	1 - 2.36		NA
URANIUM-235	pCi/L	FIL	1/1	1/1	-	.1 - .1		NA
URANIUM-235	pCi/L	UNF	9/16	9/16	0.33	.0137 - 4	1 - 1	NA
URANIUM-236	pCi/L	UNF	7/8	7/8	0.02	.0036 - 1	.001 - .001	NA
ALUMINUM	mg/L	FIL	23/139	4/139	-	.0132 - 1.07	0 - .5	0.175
ALUMINUM	mg/L	UNF	68/133	33/133	-	.0191 - 92	.014 - .5	0.225
ANTIMONY	mg/L	FIL	1/135	1/135	-	.0439 - .0439	.001 - .0587	ND
ANTIMONY	mg/L	UNF	2/133	2/133	-	.0029 - .0051	.0011 - .0587	ND
ARSENIC	mg/L	FIL	23/147	0/147	-	.001 - .161	.001 - .01	0.26
ARSENIC	mg/L	UNF	37/134	9/134	-	.001 - .35	.001 - .006	0.0294
BARIUM	mg/L	FIL	140/147	1/147	0.052	.0119 - .82	.003 - .2	0.669
BARIUM	mg/L	UNF	126/134	2/134	0.061	.0034 - 8.69	.003 - .2	0.768
BERYLLIUM	mg/L	FIL	1/135	0/135	-	.002 - .002	.0003 - .01	0.0022
BERYLLIUM	mg/L	UNF	1/133	1/133	-	.0015 - .0015	.0003 - .01	ND

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CADMIUM	mg/L	FIL	21/147	8/147	-	.0022 - .0333	.001 - .0167	0.006
CADMIUM	mg/L	UNF	18/134	5/134	-	.0022 - .0459	.001 - .0104	0.0135
CALCIUM	mg/L	FIL	146/147	34/147	108	51.8 - 334	140 - 140	136
CALCIUM	mg/L	UNF	134/134	25/134	121	1.63 - 411		159
CHROMIUM	mg/L	FIL	30/147	11/147	-	.0046 - .208	.003 - .033	0.03
CHROMIUM	mg/L	UNF	32/135	9/135	-	.0036 - 1.11	.003 - .0292	0.0211
COBALT	mg/L	FIL	5/136	5/136	-	.0088 - .0138	.003 - .0279	ND
COBALT	mg/L	UNF	13/133	6/133	-	.005 - .168	.003 - .025	0.0086
COPPER	mg/L	FIL	21/147	2/147	-	.0032 - .27	.002 - .0258	0.083
COPPER	mg/L	UNF	23/134	6/134	-	.0036 - .694	.002 - .124	0.0354
CYANIDE	mg/L	FIL	3/108	3/108	-	.023 - .07	0 - .02	ND
CYANIDE	mg/L	UNF	2/137	2/137	-	.04 - .044	0 - .05	ND
IRON	mg/L	FIL	82/147	7/147	0.048	.006 - 9.85	.005 - .151	4.14
IRON	mg/L	UNF	115/134	22/134	1.78	.0329 - 913	.012 - .587	5.72
LEAD	mg/L	FIL	21/147	3/147	-	.001 - .0132	.001 - .0053	0.009
LEAD	mg/L	UNF	43/134	29/134	-	.001 - .244	.001 - .0444	0.002
MAGNESIUM	mg/L	FIL	146/147	24/147	27	18 - 158	21.4 - 21.4	37.8
MAGNESIUM	mg/L	UNF	134/134	29/134	30	.285 - 507		38.5
MANGANESE	mg/L	FIL	105/147	5/147	0.059	.0011 - 1.58	.001 - .0148	0.78
MANGANESE	mg/L	UNF	122/134	11/134	0.191	.0013 - 139	.001 - .02	0.904
MERCURY	mg/L	FIL	2/147	0/147	-	.0002 - .0003	.0001 - .0002	0.0004
MERCURY	mg/L	UNF	2/137	2/137	-	.0004 - .0006	.0001 - .0002	ND
MOLYBDENUM	mg/L	FIL	18/130	2/130	-	.0071 - .327	.003 - .1	0.025
MOLYBDENUM	mg/L	UNF	6/72	6/72	-	.0074 - .435	.001 - .025	ND
NICKEL	mg/L	FIL	13/147	9/147	-	.0042 - .135	.003 - .031	0.023
NICKEL	mg/L	UNF	20/134	5/134	-	.0072 - .621	.003 - .031	0.0514
OSMIUM	mg/L	FIL	0/4	0/4	-		.05 - .05	NA
OSMIUM	mg/L	UNF	0/1	0/1	-		.05 - .05	NA
POTASSIUM	mg/L	FIL	131/147	27/147	2.48	.86 - 178	1.61 - 4.15	3.32
POTASSIUM	mg/L	UNF	115/134	99/134	2.68	.724 - 182	.35 - 4.02	1.96
SELENIUM	mg/L	FIL	11/147	3/147	-	.0012 - .011	.001 - .005	0.004
SELENIUM	mg/L	UNF	26/134	26/134	-	.001 - .0112	.001 - .01	0.00075
SILICON	mg/L	FIL	95/96	76/96	4.7	1.5 - 63.4	3.7 - 3.7	3.46
SILICON	mg/L	UNF	25/25	7/25	5	2.07 - 12.8		5.81
SILVER	mg/L	FIL	15/147	9/147	-	.0031 - .12	.001 - .01	0.0138
SILVER	mg/L	UNF	3/134	0/134	-	.003 - .0042	.001 - .03	0.0117
SODIUM	mg/L	FIL	147/147	8/147	13.2	2.7 - 118		55
SODIUM	mg/L	UNF	133/134	11/134	13.3	3.76 - 130	.182 - .182	47.1
THALLIUM	mg/L	FIL	1/135	1/135	-	.0022 - .0022	.001 - .01	ND
THALLIUM	mg/L	UNF	1/133	1/133	-	.0011 - .0011	.001 - .01	ND
TIN	mg/L	FIL	0/10	0/10	-		.03 - 1	NA
TIN	mg/L	UNF	0/5	0/5	-		.03 - 1	NA
VANADIUM	mg/L	FIL	14/139	1/139	-	.0031 - .0823	.0021 - .05	0.0234
VANADIUM	mg/L	UNF	15/133	6/133	-	.0031 - .251	.0021 - .05	0.0117
ZINC	mg/L	FIL	44/138	2/138	-	.0022 - .0976	.002 - .0524	0.0568
ZINC	mg/L	UNF	46/134	23/134	-	.005 - 1.12	.0034 - .232	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/25	0/25	-		1 - 5	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	7/141	7/141	-	1 - 550	1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	1/141	1/141	-	3 - 3	1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	4/141	4/141	-	5 - 58	1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	1/141	1/141	-	110 - 110	1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	1/141	1/141	-	310 - 310	1 - 10	NA

000187

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	3/141	3/141	-	4 - 5	1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	3/141	3/141	-	11 - 64	2 - 10	NA
2-HEXANONE	ug/L	UNF	1/141	1/141	-	7 - 7	2 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	1/141	1/141	-	4 - 4	1 - 10	NA
ACETONE	ug/L	UNF	10/141	10/141	-	1 - 45	1 - 36	NA
BENZENE	ug/L	UNF	2/141	2/141	-	1 - 4	1 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/140	0/140	-		1 - 10	NA
BROMOFORM	ug/L	UNF	1/141	1/141	-	2 - 2	1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	8/141	8/141	-	1 - 26	1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
CHLOROFORM	ug/L	UNF	2/141	2/141	-	1 - 29	1 - 10	NA
CHLOROMETHANE	ug/L	UNF	2/141	2/141	-	2 - 13	1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/140	0/140	-		1 - 10	NA
ETHYLBENZENE	ug/L	UNF	3/141	3/141	-	4 - 21	1 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/9	0/9	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	1/141	1/141	-	1 - 1	1 - 100	NA
STYRENE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/4	0/4	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	1/141	1/141	-	3 - 3	1 - 10	NA
TOLUENE	ug/L	UNF	3/141	3/141	-	.8 - 2	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/142	0/142	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	4/141	4/141	-	1 - 120	1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	1/35	1/35	-	66 - 66	1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/91	0/91	-		2 - 10000	NA
VINYL CHLORIDE	ug/L	UNF	0/141	0/141	-		1 - 10	NA
XYLENES, TOTAL	ug/L	UNF	6/141	6/141	-	1 - 54	1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/84	0/84	-		2 - 11	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/80	0/80	-		2 - 11	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/92	0/92	-		1 - 11	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/92	0/92	-		1 - 11	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/85	0/85	-		2 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/85	0/85	-		2 - 11	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/84	0/84	-		2 - 11	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/85	0/85	-		2 - 11	NA
2,4-DINITROPHENOL	ug/L	UNF	0/85	0/85	-		4 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/84	0/84	-		1 - 15	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/85	0/85	-		1 - 15	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/13	0/13	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/73	0/73	-		10 - 60	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
2-CHLOROPHENOL	ug/L	UNF	0/85	0/85	-		2 - 11	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/83	0/83	-		2 - 11	NA
2-METHYLPHENOL	ug/L	UNF	0/85	0/85	-		1 - 11	NA
2-NITROANILINE	ug/L	UNF	0/85	0/85	-		1 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/85	0/85	-		2 - 11	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/82	0/82	-		5 - 20	NA
3-NITROANILINE	ug/L	UNF	0/85	0/85	-		2 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/85	0/85	-		4 - 50	NA

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/85	0/85	-		2 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/85	0/85	-		2 - 11	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/85	0/85	-		1 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/80	0/80	-		1 - 11	NA
4-NITROANILINE	ug/L	UNF	0/85	0/85	-		3 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/85	0/85	-		2 - 50	NA
ACENAPHTHENE	ug/L	UNF	0/83	0/83	-		2 - 11	NA
ACENAPHTHYLENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
ANTHRACENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
BENZO(A)PYRENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/85	0/85	-		4 - 11	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
BENZOIC ACID	ug/L	UNF	0/70	0/70	-		4 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/70	0/70	-		2 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/85	0/85	-		2 - 20	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/85	0/85	-		2 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/85	0/85	-		2 - 20	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	8/85	8/85	-	.8 - 41	1 - 21	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	12/85	12/85	-	1 - 2	4 - 11	NA
CARBAZOLE	ug/L	UNF	0/50	0/50	-		5 - 11	NA
CHRYSENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
CUMENE	ug/L	UNF	0/23	0/23	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	11/85	11/85	-	2 - 60	2 - 11	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/83	0/83	-		2 - 11	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
DIBENZOFURAN	ug/L	UNF	0/85	0/85	-		1 - 11	NA
DIETHYL PHTHALATE	ug/L	UNF	0/85	0/85	-		1 - 11	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
FLUORANTHENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
FLUORENE	ug/L	UNF	0/85	0/85	-		1 - 11	NA
HEXACHLOROBENZENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
HEXACHLOROETHANE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/85	0/85	-		4 - 11	NA
ISOPHORONE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/16	0/16	-		4 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/85	0/85	-		2 - 50	NA
NAPHTHALENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
NITROBENZENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
O,O,O-TRIETHYLPHOSPHOROTHIOATE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/85	0/85	-		2 - 20	NA
PENTACHLOROPHENOL	ug/L	UNF	0/86	0/86	-		2 - 50	NA
PHENANTHRENE	ug/L	UNF	0/85	0/85	-		1 - 11	NA
PHENOL	ug/L	UNF	3/86	3/86	-	6 - 50	2 - 11	NA
PYRENE	ug/L	UNF	0/85	0/85	-		2 - 11	NA
PYRIDINE	ug/L	UNF	0/12	0/12	-		4 - 50000	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	0/12	0/12	-		10 - 10	NA
4,4'-DDD	ug/L	UNF	0/78	0/78	-		.01 - 4	NA
4,4'-DDE	ug/L	UNF	0/78	0/78	-		.01 - 4	NA

000189

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4,4'-DDT	ug/L	UNF	0/78	0/78	-		.01 - 4	NA
ALDRIN	ug/L	UNF	1/78	1/78	-	.11 - .11	.005 - 1	NA
ALPHA-BHC	ug/L	UNF	0/78	0/78	-		.005 - 1	NA
ALPHA-CHLORDANE	ug/L	UNF	0/72	0/72	-		.05 - 1	NA
AROCLOR-1016	ug/L	UNF	0/78	0/78	-		.05 - 1	NA
AROCLOR-1221	ug/L	UNF	0/78	0/78	-		.05 - 2.1	NA
AROCLOR-1232	ug/L	UNF	0/78	0/78	-		.05 - 1	NA
AROCLOR-1242	ug/L	UNF	0/78	0/78	-		.05 - 1	NA
AROCLOR-1248	ug/L	UNF	0/78	0/78	-		.05 - 1	NA
AROCLOR-1254	ug/L	UNF	0/78	0/78	-		.1 - 1	NA
AROCLOR-1260	ug/L	UNF	0/78	0/78	-		.1 - 1	NA
BETA-BHC	ug/L	UNF	0/78	0/78	-		.005 - 1	NA
CHLORDANE	ug/L	UNF	0/14	0/14	-		.2 - 1	NA
CHLOROBENZILATE	ug/L	UNF	0/4	0/4	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/78	0/78	-		.005 - 1	NA
DIELDRIN	ug/L	UNF	0/78	0/78	-		.01 - 1	NA
ENDOSULFAN II	ug/L	UNF	1/78	1/78	-	.15 - .15	.01 - 1	NA
ENDOSULFAN SULFATE	ug/L	UNF	1/78	1/78	-	2.6 - 2.6	.01 - 1	NA
ENDOSULFAN-I	ug/L	UNF	0/78	0/78	-		.005 - 1	NA
ENDRIN	ug/L	UNF	0/81	0/81	-		.01 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/55	0/55	-		.099 - 1	NA
ENDRIN KETONE	ug/L	UNF	0/72	0/72	-		.01 - .5	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/81	0/81	-		.005 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/73	0/73	-		.05 - .5	NA
HEPTACHLOR	ug/L	UNF	1/78	1/78	-	.07 - .07	.005 - 1	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/78	0/78	-		.005 - 1	NA
METHOXYCHLOR	ug/L	UNF	0/79	0/79	-		.05 - 200	NA
SULFOTEP	ug/L	UNF	0/7	0/7	-		1 - 1000	NA
TOXAPHENE	ug/L	UNF	0/82	0/82	-		.1 - 500	NA
2,4,5-T	ug/L	UNF	0/10	0/10	-		.25 - 5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/16	0/16	-		.025 - 500	NA
2,4-D	ug/L	UNF	0/16	0/16	-		.05 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/26	0/26	-		.2 - 2000	NA
DEMETON	ug/L	UNF	0/26	0/26	-		.04 - 1000	NA
DIAZINON	ug/L	UNF	0/26	0/26	-		.02 - 500	NA
DIMETHOATE	ug/L	UNF	0/7	0/7	-		1 - 1000	NA
DISULFOTON	ug/L	UNF	0/31	0/31	-		.02 - 1000	NA
ETHION	ug/L	UNF	0/26	0/26	-		.02 - 500	NA
FAMPHUR	ug/L	UNF	0/7	0/7	-		1 - 1000	NA
MALATHION	ug/L	UNF	0/26	0/26	-		.02 - 1000	NA
METHYL PARATHION	ug/L	UNF	0/31	0/31	-		.04 - 1000	NA
PARATHION	ug/L	UNF	0/31	0/31	-		.02 - 1000	NA
PHORATE	ug/L	UNF	0/7	0/7	-		1 - 1000	NA
THIONAZIN	ug/L	UNF	0/7	0/7	-		1 - 1000	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.67 - 1.1	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.51 - 4.8	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.66 - 1.6	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.92 - 1.2	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.25 - .5	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.87 - 1.1	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.23 - .46	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.8 - 1	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.39 - 2.3	NA

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.69 - 1.9	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.41 - .74	NA
1,4-DIOXANE	ng/L	UNF	0/9	0/9	-		1000 - 5000	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.34 - 1.2	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.41 - .71	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ng/L	UNF	1/9	1/9	-	1.7 - 1.7	.39 - 2.5	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ng/L	UNF	1/6	1/6	-	1.2 - 1.2	.33 - 3.2	NA
HEPTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/8	0/8	-		.18 - 1.8	NA
HEPTACHLORODIBENZOFURANS	ng/L	UNF	0/8	0/8	-		.28 - 5.3	NA
HEXACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/11	0/11	-		.1 - 3.5	NA
HEXACHLORODIBENZOFURANS	ng/L	UNF	1/11	1/11	-	.38 - .38	.11 - 2.1	NA
OCTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	1/8	1/8	-	.7 - .7	.33 - 6.4	NA
OCTACHLORODIBENZOFURAN	ng/L	UNF	0/8	0/8	-		.02 - 6	NA
PENTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/10	0/10	-		.13 - 2.1	NA
PENTACHLORODIBENZOFURANS	ng/L	UNF	1/11	1/11	-	.31 - .31	.099 - 1.3	NA
TETRACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/11	0/11	-		.07 - 2.3	NA
TETRACHLORODIBENZOFURANS	ng/L	UNF	1/11	1/11	-	.22 - .22	.22 - 1.7	NA
ALKALINITY AS CACO3	mg/L	UNF	139/139	139/139	282	188 - 484		NA
ALLYL CHLORIDE	-	UNF	0/24	0/24	-		5 - 20	NA
AMMONIA	mg/L	FIL	1/3	1/3	-	.4 - .4	.1 - .1	NA
AMMONIA	mg/L	UNF	61/154	4/154	-	.02 - 17	.02 - .4	4.2
BICARBONATE	-	UNF	15/15	15/15	280	6 - 373		NA
BICARBONATE ALKALINITY	-	UNF	103/103	103/103	350	240 - 631		NA
CARBONATE ALKALINITY	-	UNF	1/104	1/104	1.5	2 - 2	1 - 30	NA
CHEMICAL OXYGEN DEMAND	-	UNF	5/12	5/12	-	11 - 92	5 - 10	NA
CHLORIDE	mg/L	UNF	149/156	12/156	24	3 - 340	3.5 - 28	73
FLUORIDE	mg/L	UNF	141/155	3/155	0.2	.09 - 1.36	.1 - .28	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	1/13	1/13	-	.02 - .02	.005 - .02	NA
NITRATE	mg/L	UNF	100/139	7/139	0.75	.016 - 79.4	.02 - 2.5	11.4
NITRATE, AS NITROGEN	mg/L	UNF	50/67	50/67	0.82	.03 - 63.6	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	73/109	12/109	0.43	.02 - 210	.02 - .09	4.1
NITRITE, AS NITROGEN	mg/L	UNF	4/28	4/28	-	.03 - 3	0 - .02	NA
PH	-	UNF	114/115	114/115	7.39	6.97 - 8.16	7.33 - 7.33	NA
PHENOLS	mg/L	UNF	19/155	1/155	-	.002 - .072	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	11/12	11/12	0.39	.01 - 7.2		NA
PHOSPHORUS	mg/L	UNF	92/156	92/156	0.06	.01 - 170	.02 - .33	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	115/115	115/115	805	424 - 3400		NA
SULFATE	mg/L	UNF	149/155	22/155	87	.062 - 740	2 - 218	197
SULFIDE	mg/L	UNF	15/117	15/117	-	.5 - 44.2	.05 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	69/69	10/69	478	90 - 1480		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	91/136	7/136	0.16	.1 - 8.5	.1 - .4	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	68/146	23/146	0.5	1 - 49	.632 - 10	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	26/152	10/152	-	.01 - .12	.01 - 10	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	11/84	11/84	-	.01 - .092	.01 - 10	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	86/152	7/152	0.1	0 - 3.15	-3.2 - .2	0.9
TOTAL SOLIDS	mg/L	UNF	99/99	25/99	552	332 - 2560		711
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/25	0/25	-		1 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/8	0/8	-		4 - 10	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/25	0/25	-		2 - 20	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/25	0/25	-		2 - 20	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/8	0/8	-		10 - 15	NA

000191

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
1-NAPHTHYLAMINE	ug/L	UNF	0/8	0/8	-		15 - 120	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/8	0/8	-		4 - 10	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/8	0/8	-		4 - 10	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/25	0/25	-		5 - 20	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/8	0/8	-		4 - 170	NA
2-PICOLINE	ug/L	UNF	0/8	0/8	-		15 - 70	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/8	0/8	-		15 - 80	NA
3-CHLOROPROPENE	ug/L	UNF	0/5	0/5	-		5 - 5	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/8	0/8	-		15 - 30	NA
3-METHYLPHENOL	ug/L	UNF	0/13	0/13	-		4 - 10	NA
4-AMINOBIPHENYL	ug/L	UNF	0/8	0/8	-		15 - 50	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/8	0/8	-		15 - 20	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/8	0/8	-		15 - 20	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
ACETONITRILE	ug/L	UNF	0/9	0/9	-		200 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
ACROLEIN	ug/L	UNF	0/31	0/31	-		10 - 50	NA
ACROLEIN	ug/L	UNF	0/31	0/31	-		10 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/31	0/31	-		10 - 50	NA
ALACHLOR	ug/L	UNF	0/6	0/6	-		2000 - 2000	NA
ANILINE	ug/L	UNF	0/8	0/8	-		4 - 10	NA
ARAMITE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
ATRAZINE	ug/L	UNF	0/6	0/6	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/6	0/6	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/6	0/6	-		1000 - 1000	NA
DIALLATE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/9	0/9	-		1 - 10	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/25	0/25	-		1 - 200	NA
DINOSEB	ug/L	UNF	0/10	0/10	-		.5 - 20	NA
DIPHENYLAMINE	ug/L	UNF	0/12	0/12	-		10 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/25	0/25	-		20 - 100	NA
ETHYL METHACRYLATE	ug/L	UNF	0/25	0/25	-		5 - 20	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
FONOFOS	ug/L	UNF	0/6	0/6	-		1000 - 1000	NA
HEXACHLOROPHENE	ug/L	UNF	0/8	0/8	-		4 - 500	NA
HEXACHLOROPROPENE	ug/L	UNF	0/8	0/8	-		4 - 20	NA
IODOMETHANE	ug/L	UNF	0/25	0/25	-		5 - 20	NA
ISODRIN	ug/L	UNF	0/8	0/8	-		.05 - 4	NA
ISOSAFROLE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
KEPONE	ug/L	UNF	0/8	0/8	-		.1 - 4	NA
LINURON	ug/L	UNF	0/6	0/6	-		1000 - 1000	NA
METHACRYLONITRILE	ug/L	UNF	0/25	0/25	-		5 - 20	NA
METHAPYRILENE	ug/L	UNF	0/8	0/8	-		15 - 40	NA
METHYL METHACRYLATE	ug/L	UNF	0/25	0/25	-		5 - 20	NA
METHYL METHANESULFONATE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
METOLACHLOR	ug/L	UNF	0/6	0/6	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/6	0/6	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/8	0/8	-		4 - 20	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/8	0/8	-		4 - 10	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/8	0/8	-		4 - 10	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/8	0/8	-		10 - 15	NA

TABLE E.2-1
SUMMARY STATISTICS FOR FEMP TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
N-NITROSOPIPERIDINE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/8	0/8	-		15 - 30	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/8	0/8	-		15 - 50	NA
PENTACHLOROBENZENE	ug/L	UNF	0/8	0/8	-		4 - 20	NA
PENTACHLOROETHANE	ug/L	UNF	0/25	0/25	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/8	0/8	-		4 - 20	NA
PHENACETIN	ug/L	UNF	0/8	0/8	-		4 - 10	NA
PRONAMIDE	ug/L	UNF	0/8	0/8	-		15 - 30	NA
SAFROLE	ug/L	UNF	0/8	0/8	-		10 - 15	NA
SIMIZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TERBUFOS	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/74	0/74	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/24	0/24	-		20 - 100	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000193

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	46/73	21/73	0.5	.3 - 29.5	0.1 - 1	0.9
URANIUM-238	pCi/L	UNF	40/86	32/86	-	.3 - 25.3	0.1 - 1	0.64
URANIUM, TOTAL	ug/L	FIL	58/73	34/73	0.6	.2 - 104	0.1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	87/101	47/101	1.1	.2 - 110	0.1 - 1	1.2
URANIUM-234	pCi/L	FIL	43/73	26/73	0.7	.3 - 28.7	0.1 - 1	0.9
URANIUM-234	pCi/L	UNF	51/86	30/86	0.6	.278 - 24.3	0.2 - 1	0.8
THORIUM-230	pCi/L	FIL	19/73	19/73	-	.3 - 2.53	0.2 - 1	0.29
THORIUM-230	pCi/L	UNF	21/85	3/85	-	.3 - 1.09	0.2 - 1	0.89
RADIUM-226	pCi/L	FIL	18/73	4/73	-	1.1 - 3.6	0.4 - 1.1	1.9
RADIUM-226	pCi/L	UNF	12/85	0/85	-	1.1 - 7.5	0.4 - 1.3	105
URANIUM-235/236	pCi/L	FIL	6/73	6/73	-	.3 - 2.51	0.1 - 1	ND
URANIUM-235/236	pCi/L	UNF	8/86	8/86	-	.26 - 1.09	0.1 - 1	0.094
THORIUM-232	pCi/L	FIL	12/73	12/73	-	.3 - .9	0.1 - 1	0.3
THORIUM-232	pCi/L	UNF	9/85	9/85	-	.3 - .9	0.1 - 1.9	0.23
THORIUM, TOTAL	ug/L	FIL	25/37	6/37	1.8	0 - 6.3841	0.5 - 8.5	2.8
THORIUM, TOTAL	ug/L	UNF	34/76	30/76	1.5	.912 - 2000	0.5 - 18	0.97
RADIUM-228	pCi/L	FIL	0/73	0/73	-		1.7 - 3	ND
RADIUM-228	pCi/L	UNF	6/85	2/85	-	3.1 - 7.1	1.6 - 3.7	3.6
THORIUM-228	pCi/L	FIL	12/73	5/73	-	.3 - 8.6	0.1 - 1	0.4
THORIUM-228	pCi/L	UNF	3/85	0/85	-	.3 - .6	0.1 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	1/17	1/17	-	3.25 - 3.25	0.5 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/60	0/60	-		0.5 - 2.4	ND
PLUTONIUM-239/240	pCi/L	FIL	0/25	0/25	-		0.5 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	2/71	2/71	-	.6 - .6	0.5 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	1/25	1/25	-	.64 - .64	0.5 - 1	ND
PLUTONIUM-238	pCi/L	UNF	3/71	3/71	-	.65 - 2.7	0.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/25	0/25	-		0.5 - 5	ND
STRONTIUM-90	pCi/L	UNF	1/70	1/70	-	2.1 - 2.1	0.5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	1/31	1/31	-	24.4 - 24.4	12.6 - 30	ND
TECHNETIUM-99	pCi/L	UNF	1/76	1/76	-	24.4 - 24.4	13.1 - 39	ND
RUTHENIUM-106	pCi/L	FIL	0/17	0/17	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/61	0/61	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/24	0/24	-		4 - 20	ND
CESIUM-137	pCi/L	UNF	0/67	0/67	-		4 - 20	ND
GROSS ALPHA	pCi/L	FIL	28/73	28/73	-	2.1 - 52.9	0 - 14	NA
GROSS ALPHA	pCi/L	UNF	38/80	38/80	-	.5 - 30.8	0.8 - 620	NA
GROSS BETA	pCi/L	FIL	53/73	53/73	4.5	2.6 - 180	0 - 5.7	NA
GROSS BETA	pCi/L	UNF	55/80	55/80	6	1.8 - 195	0.7 - 880	NA
RADIUM, TOTAL	pCi/L	UNF	2/2	2/2	-	1 - 1		NA
URANIUM-235	pCi/L	UNF	6/10	6/10	0.04	.01 - .0514	1 - 1	NA
URANIUM-236	pCi/L	UNF	5/6	5/6	0.006	.003 - .0987	0.001 - .001	NA
ALUMINUM	mg/L	FIL	8/76	4/76	-	.0974 - 1.44	0.014 - .5	0.175
ALUMINUM	mg/L	UNF	21/78	8/78	-	.021 - 2.34	0.014 - .5	0.225
ANTIMONY	mg/L	FIL	1/74	1/74	-	.0608 - .0608	0.0222 - .0667	ND
ANTIMONY	mg/L	UNF	1/77	1/77	-	.072 - .072	0.0222 - .045	ND
ARSENIC	mg/L	FIL	17/80	0/80	-	.0011 - .23	0.001 - .006	0.26
ARSENIC	mg/L	UNF	26/78	3/78	-	.0011 - .234	0.001 - .006	0.0294
BARIUM	mg/L	FIL	77/80	0/80	0.060	.0247 - .627	0.0297 - .2	0.669
BARIUM	mg/L	UNF	73/78	0/78	0.062	.0251 - .584	0.0374 - .2	0.768
BERYLLIUM	mg/L	FIL	2/75	1/75	-	.0012 - .174	0.0003 - .01	0.0022
BERYLLIUM	mg/L	UNF	1/78	1/78	-	.178 - .178	0.0003 - .01	ND
CADMIUM	mg/L	FIL	9/80	2/80	-	.003 - .203	0.001 - .0056	0.006
CADMIUM	mg/L	UNF	6/77	3/77	-	.0034 - .211	0.001 - .005	0.0135

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TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	FIL	81/81	8/81	92.1	39.2 - 332		136
CALCIUM	mg/L	UNF	78/78	9/78	94.0	43.7 - 308		159
CHROMIUM	mg/L	FIL	13/80	6/80	-	.0128 - .397	0.003 - .01	0.03
CHROMIUM	mg/L	UNF	11/78	2/78	-	.0042 - .405	0.003 - .015	0.0211
COBALT	mg/L	FIL	4/75	4/75	-	.0059 - .516	0.005 - .025	ND
COBALT	mg/L	UNF	9/78	3/78	-	.0052 - .528	0.004 - .025	0.0086
COPPER	mg/L	FIL	7/80	1/80	-	.0033 - .186	0.0026 - .025	0.083
COPPER	mg/L	UNF	11/78	2/78	-	.0034 - .19	0.0026 - .0785	0.0354
CYANIDE	mg/L	FIL	0/65	0/65	-		0 - .02	ND
CYANIDE	mg/L	UNF	0/76	0/76	-		0 - .02	ND
IRON	mg/L	FIL	66/80	11/80	1.3	.0225 - 22	0.012 - 2.36	4.14
IRON	mg/L	UNF	68/78	13/78	2.2	.0435 - 78.9	0.0315 - .868	5.72
LEAD	mg/L	FIL	15/80	2/80	-	.0011 - .3	0.001 - .011	0.009
LEAD	mg/L	UNF	22/78	14/78	-	.0012 - .295	0.001 - .005	0.002
MAGNESIUM	mg/L	FIL	81/81	8/81	23.6	17.6 - 75.4		37.8
MAGNESIUM	mg/L	UNF	78/78	10/78	23.9	18.8 - 76.6		38.5
MANGANESE	mg/L	FIL	75/80	2/80	0.209	.004 - 1.65	0.001 - .0028	0.78
MANGANESE	mg/L	UNF	76/78	4/78	0.264	.002 - 2.4	0.0024 - .02	0.904
MERCURY	mg/L	FIL	3/80	2/80	-	.0003 - .0052	0.0002 - .001	0.0004
MERCURY	mg/L	UNF	1/78	1/78	-	.0049 - .0049	2E-07 - .0002	ND
MOLYBDENUM	mg/L	FIL	11/69	0/69	-	.0035 - .02	0.01 - .1	0.025
MOLYBDENUM	mg/L	UNF	1/34	1/34	-	.0154 - .0154	0.01 - .025	ND
NICKEL	mg/L	FIL	4/80	2/80	-	.02 - .518	0.005 - .0444	0.023
NICKEL	mg/L	UNF	4/78	1/78	-	.0104 - .547	0.005 - .039	0.0514
OSMIUM	mg/L	FIL	0/2	0/2	-		0.05 - .05	NA
POTASSIUM	mg/L	FIL	66/80	7/80	2.3	.81 - 225	0.82 - 3.18	3.32
POTASSIUM	mg/L	UNF	62/77	52/77	2.4	.891 - 268	1 - 3.34	1.96
SELENIUM	mg/L	FIL	11/80	1/80	-	.001 - .246	0.001 - .03	0.004
SELENIUM	mg/L	UNF	13/77	13/77	-	.001 - .234	0.001 - .01	0.00075
SILICON	mg/L	FIL	46/46	26/46	3.9	.402 - 10.9		3.46
SILICON	mg/L	UNF	4/4	1/4	4.8	3.35 - 8.83		5.81
SILVER	mg/L	FIL	10/80	3/80	-	.0039 - .0857	0.001 - .01	0.0138
SILVER	mg/L	UNF	3/78	2/78	-	.0045 - .0799	0.001 - .008	0.0117
SODIUM	mg/L	FIL	79/80	6/80	11.9	3.15 - 321	110 - 110	55
SODIUM	mg/L	UNF	78/78	8/78	11.8	3.08 - 294		47.1
THALLIUM	mg/L	FIL	1/74	1/74	-	.0584 - .0584	0.001 - .01	ND
THALLIUM	mg/L	UNF	1/77	1/77	-	.0569 - .0569	0.001 - .01	ND
TIN	mg/L	FIL	0/3	0/3	-		0.03 - 1	NA
TIN	mg/L	UNF	0/2	0/2	-		0.0556 - 1	NA
VANADIUM	mg/L	FIL	3/76	1/76	-	.0038 - .282	0.0029 - .05	0.0234
VANADIUM	mg/L	UNF	1/78	1/78	-	.29 - .29	0.0029 - .05	0.0117
ZINC	mg/L	FIL	16/75	1/75	-	.0023 - .122	0.002 - .0601	0.0568
ZINC	mg/L	UNF	22/78	10/78	-	.0082 - .126	0.0039 - .301	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/18	0/18	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/78	0/78	-		1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/78	0/78	-		0.5 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/76	0/76	-		1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	3/76	3/76	-	26 - 210	2 - 15	NA

000195

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2-HEXANONE	ug/L	UNF	0/76	0/76	-		2 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/76	0/76	-		2 - 10	NA
ACETONE	ug/L	UNF	4/77	4/77	-	2 - 13.6	2 - 200	NA
BENZENE	ug/L	UNF	1/77	1/77	-	.3 - .3	1 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
BROMOFORM	ug/L	UNF	0/77	0/77	-		1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	2/76	2/76	-	.5 - 8	1 - 55	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	0/76	0/76	-		1 - 10	NA
CHLOROFORM	ug/L	UNF	1/77	1/77	-	.3 - .3	1 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/3	0/3	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	2/78	2/78	-	.7 - 2	1 - 10	NA
STYRENE	ug/L	UNF	0/76	0/76	-		1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/1	0/1	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	2/78	2/78	-	1 - 1	1 - 10	NA
TOLUENE	ug/L	UNF	5/78	5/78	-	.7 - 32	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/78	0/78	-		1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/22	0/22	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/45	0/45	-		2 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/77	0/77	-		1 - 10	NA
XYLENES, TOTAL	ug/L	UNF	1/76	1/76	-	.5 - .5	1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/24	0/24	-		1 - 11	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/24	0/24	-		1 - 11	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/21	0/21	-		2 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/21	0/21	-		2 - 11	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/21	0/21	-		2 - 11	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/21	0/21	-		2 - 11	NA
2,4-DINITROPHENOL	ug/L	UNF	0/21	0/21	-		4 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/21	0/21	-		1 - 15	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/21	0/21	-		1 - 15	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	1/45	1/45	-	60 - 60	10 - 60	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
2-CHLOROPHENOL	ug/L	UNF	0/21	0/21	-		2 - 11	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/19	0/19	-		2 - 11	NA
2-METHYLPHENOL	ug/L	UNF	0/21	0/21	-		1 - 11	NA
2-NITROANILINE	ug/L	UNF	0/21	0/21	-		1 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/21	0/21	-		2 - 11	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/19	0/19	-		10 - 20	NA
3-NITROANILINE	ug/L	UNF	0/21	0/21	-		2 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/21	0/21	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/21	0/21	-		2 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/21	0/21	-		2 - 11	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/21	0/21	-		1 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/18	0/18	-		1 - 11	NA

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-NITROANILINE	ug/L	UNF	0/21	0/21	-		3 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/21	0/21	-		2 - 50	NA
ACENAPHTHENE	ug/L	UNF	0/19	0/19	-		2 - 11	NA
ACENAPHTHYLENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
ANTHRACENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
BENZO(A)PYRENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/21	0/21	-		4 - 11	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
BENZOIC ACID	ug/L	UNF	0/9	0/9	-		4 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/10	0/10	-		2 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/21	0/21	-		2 - 15	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/21	0/21	-		2 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/21	0/21	-		2 - 15	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	4/21	4/21	-	.9 - 4	1 - 11	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	2/21	2/21	-	1 - 1	4 - 11	NA
CARBAZOLE	ug/L	UNF	0/11	0/11	-		10 - 11	NA
CHRYSENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
CUMENE	ug/L	UNF	0/17	0/17	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	3/21	3/21	-	.8 - 36	2 - 11	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/19	0/19	-		2 - 11	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
DIBENZOFURAN	ug/L	UNF	0/21	0/21	-		1 - 11	NA
DIETHYL PHTHALATE	ug/L	UNF	1/21	1/21	-	1 - 1	1 - 11	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
FLUORANTHENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
FLUORENE	ug/L	UNF	0/21	0/21	-		1 - 11	NA
HEXACHLOROBENZENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
HEXACHLOROETHANE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/21	0/21	-		4 - 11	NA
ISOPHORONE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/3	0/3	-		4 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
NAPHTHALENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
NITROBENZENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
O,O,O-TRIETHYLPHOSPHOROTHIOATE	ug/L	UNF	0/2	0/2	-		10 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
PENTACHLOROPHENOL	ug/L	UNF	0/22	0/22	-		2 - 50	NA
PHENANTHRENE	ug/L	UNF	0/21	0/21	-		1 - 11	NA
PHENOL	ug/L	UNF	2/22	2/22	-	2 - 5	2 - 100	NA
PYRENE	ug/L	UNF	0/21	0/21	-		2 - 11	NA
PYRIDINE	ug/L	UNF	0/6	0/6	-		4 - 50000	NA
4,4'-DDD	ug/L	UNF	0/21	0/21	-		0.01 - 4	NA
4,4'-DDE	ug/L	UNF	0/21	0/21	-		0.01 - 4	NA
4,4'-DDT	ug/L	UNF	0/21	0/21	-		0.01 - 4	NA
ALDRIN	ug/L	UNF	0/21	0/21	-		0.005 - .2	NA
ALPHA-BHC	ug/L	UNF	0/21	0/21	-		0.005 - .2	NA
ALPHA-CHLORDANE	ug/L	UNF	0/18	0/18	-		0.05 - .5	NA
AROCLOR-1016	ug/L	UNF	0/21	0/21	-		0.05 - 1	NA

000397

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
AROCLOR-1221	ug/L	UNF	0/21	0/21	-		0.05 - 2.1	NA
AROCLOR-1232	ug/L	UNF	0/21	0/21	-		0.05 - 2	NA
AROCLOR-1242	ug/L	UNF	0/21	0/21	-		0.05 - 2	NA
AROCLOR-1248	ug/L	UNF	0/21	0/21	-		0.05 - 2	NA
AROCLOR-1254	ug/L	UNF	0/21	0/21	-		0.1 - 2	NA
AROCLOR-1260	ug/L	UNF	0/21	0/21	-		0.1 - 2	NA
BETA-BHC	ug/L	UNF	0/21	0/21	-		0.005 - .2	NA
CHLORDANE	ug/L	UNF	0/6	0/6	-		0.2 - .2	NA
CHLOROBENZILATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/21	0/21	-		0.005 - .2	NA
DIELDRIN	ug/L	UNF	1/21	1/21	-	.016 - .016	0.01 - .2	NA
ENDOSULFAN II	ug/L	UNF	0/21	0/21	-		0.01 - .2	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/21	0/21	-		0.01 - .2	NA
ENDOSULFAN-I	ug/L	UNF	1/21	1/21	-	.025 - .025	0.005 - .2	NA
ENDRIN	ug/L	UNF	0/28	0/28	-		0.01 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/18	0/18	-		0.1 - .2	NA
ENDRIN KETONE	ug/L	UNF	0/18	0/18	-		0.01 - .1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/28	0/28	-		0.005 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/18	0/18	-		0.05 - 1.5	NA
HEPTACHLOR	ug/L	UNF	0/21	0/21	-		0.005 - .2	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/21	0/21	-		0.005 - .2	NA
METHOXYCHLOR	ug/L	UNF	0/27	0/27	-		0.05 - 200	NA
SULFOTEP	ug/L	UNF	0/2	0/2	-		15 - 1000	NA
TOXAPHENE	ug/L	UNF	0/28	0/28	-		0.1 - 500	NA
2,4,5-T	ug/L	UNF	0/4	0/4	-		0.1 - 5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/12	0/12	-		0.025 - 500	NA
2,4-D	ug/L	UNF	0/12	0/12	-		0.05 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/3	0/3	-		0.2 - 5	NA
DEMETON	ug/L	UNF	0/3	0/3	-		0.2 - 1	NA
DIAZINON	ug/L	UNF	0/3	0/3	-		0.1 - .5	NA
DIMETHOATE	ug/L	UNF	0/2	0/2	-		15 - 1000	NA
DISULFOTON	ug/L	UNF	0/5	0/5	-		0.1 - 1000	NA
ETHION	ug/L	UNF	0/3	0/3	-		0.1 - .5	NA
FAMPHUR	ug/L	UNF	0/2	0/2	-		15 - 1000	NA
MALATHION	ug/L	UNF	0/3	0/3	-		0.1 - 1	NA
METHYL PARATHION	ug/L	UNF	0/5	0/5	-		0.1 - 50	NA
PARATHION	ug/L	UNF	0/5	0/5	-		0.1 - 50	NA
PHORATE	ug/L	UNF	0/2	0/2	-		15 - 1000	NA
THIONAZIN	ug/L	UNF	0/2	0/2	-		15 - 1000	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/2	0/2	-		0.62 - .7	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		1.1 - 1.5	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.82 - 1.4	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/2	0/2	-		1.2 - 1.4	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		0.19 - .82	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		0.34 - 1.3	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.4 - .75	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/2	0/2	-		1.1 - 1.2	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.96 - 2.6	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/2	0/2	-		1.2 - 5.3	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		0.13 - 2.1	NA
1,4-DIOXANE	ng/L	UNF	0/3	0/3	-		1000 - 5000	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.43 - .8	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.56 - 2	NA

000198

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/4	0/4	-		0.29 - 1.2	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.52 - 1.3	NA
HEPTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/2	0/2	-		0.62 - .7	NA
HEPTACHLORODIBENZOFURANS	ng/L	UNF	0/2	0/2	-		1.2 - 1.6	NA
HEXACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/4	0/4	-		0.21 - 1.3	NA
HEXACHLORODIBENZOFURANS	ng/L	UNF	0/4	0/4	-		0.11 - 2.7	NA
OCTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/2	0/2	-		0.84 - 1.4	NA
OCTACHLORODIBENZOFURAN	ng/L	UNF	0/2	0/2	-		0.55 - 1.1	NA
PENTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/4	0/4	-		0.11 - 5.3	NA
PENTACHLORODIBENZOFURANS	ng/L	UNF	1/4	1/4	-	.43 - .43	0.11 - 1.2	NA
TETRACHLORODIBENZO-P-DIOXINS	ng/L	UNF	1/4	1/4	-	3.8 - 3.8	0.14 - 2.5	NA
TETRACHLORODIBENZOFURANS	ng/L	UNF	1/4	1/4	-	1.1 - 1.1	0.4 - 1.6	NA
ALKALINITY AS CACO3	mg/L	UNF	76/76	76/76	257	206 - 548		NA
ALLYL CHLORIDE	-	UNF	0/18	0/18	-		5 - 20	NA
AMMONIA	mg/L	UNF	53/84	4/84	0.087	.03 - 25	0.02 - .4	4.2
BICARBONATE	-	UNF	12/12	12/12	235	190 - 305		NA
BICARBONATE ALKALINITY	-	UNF	69/69	69/69	311	200 - 671		NA
CARBONATE ALKALINITY	-	UNF	1/69	1/69	-	1 - 1	1 - 30	NA
CHEMICAL OXYGEN DEMAND	-	UNF	4/11	4/11	-	8 - 27	5 - 10	NA
CHLORIDE	mg/L	UNF	81/84	9/84	23.5	1.55 - 750	19 - 35	73
FLUORIDE	mg/L	UNF	72/84	0/84	0.18	.08 - .8	0.1 - .26	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	0/7	0/7	-		0.005 - 2.76	NA
NITRATE	mg/L	UNF	34/68	0/68	0.05	.02 - 3.2	0.013 - .278	11.4
NITRATE, AS NITROGEN	mg/L	UNF	22/41	22/41	-	.02 - 21.8	0.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	30/70	1/70	-	.02 - 4.1	0.02 - .05	4.1
NITRITE, AS NITROGEN	mg/L	UNF	5/23	5/23	-	.03 - 1.5	0.02 - .02	NA
PH	-	UNF	72/72	72/72	7.5	7.1 - 8.2		NA
PHENOLS	mg/L	UNF	9/84	1/84	-	.002 - .033	0.002 - .15	0.03
PHOSPHATE	mg/L	UNF	10/10	10/10	0.43	.01 - 1.1		NA
PHOSPHORUS	mg/L	UNF	43/85	43/85	0.07	.03 - 13	0.01 - 306	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	72/72	72/72	648	370 - 2600		NA
SULFATE	mg/L	UNF	82/84	8/84	74	3.4 - 520	0.059 - .059	197
SULFIDE	mg/L	UNF	5/53	5/53	-	.0005 - 28.04	0.2 - 1000	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	42/42	4/42	386	130 - 1474		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	57/76	4/76	0.2	.1 - 27	0.1 - .4	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	43/80	18/80	1.0	1 - 140	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	17/83	6/83	-	.01 - .21	0.01 - 10	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	5/53	5/53	-	.014 - .033	0.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	30/82	1/82	-	.005 - 3.2	-2 - .19	0.9
TOTAL SOLIDS	mg/L	UNF	67/67	67/67	425	340 - 1600		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/18	0/18	-		1 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/3	0/3	-		4 - 10	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/18	0/18	-		2 - 20	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/18	0/18	-		2 - 20	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/3	0/3	-		15 - 120	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/3	0/3	-		4 - 10	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/3	0/3	-		4 - 10	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/18	0/18	-		5 - 20	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/3	0/3	-		4 - 170	NA

000199

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2-PICOLINE	ug/L	UNF	0/3	0/3	-		15 - 70	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/3	0/3	-		15 - 80	NA
3-CHLOROPROPENE	ug/L	UNF	0/2	0/2	-		5 - 5	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/3	0/3	-		15 - 30	NA
3-METHYLPHENOL	ug/L	UNF	0/6	0/6	-		4 - 10	NA
4-AMINOBIPHENYL	ug/L	UNF	0/3	0/3	-		15 - 50	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/3	0/3	-		15 - 20	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/3	0/3	-		15 - 20	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
ACETONITRILE	ug/L	UNF	0/3	0/3	-		200 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
ACROLEIN	ug/L	UNF	0/21	0/21	-		20 - 50	NA
ACROLEIN	ug/L	UNF	0/21	0/21	-		20 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/21	0/21	-		20 - 50	NA
ALACHLOR	ug/L	UNF	0/8	0/8	-		2000 - 2000	NA
ANILINE	ug/L	UNF	0/3	0/3	-		4 - 10	NA
ARAMITE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
ATRAZINE	ug/L	UNF	0/8	0/8	-		1000 - 2000	NA
CARBOFURAN	ug/L	UNF	0/8	0/8	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/8	0/8	-		1000 - 1000	NA
DIALLATE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/3	0/3	-		1 - 10	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/18	0/18	-		1 - 10	NA
DINOSEB	ug/L	UNF	0/4	0/4	-		0.5 - 20	NA
DIPHENYLAMINE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/18	0/18	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/18	0/18	-		5 - 20	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
FONOFOS	ug/L	UNF	0/8	0/8	-		1000 - 1000	NA
HEXACHLOROPHENE	ug/L	UNF	0/3	0/3	-		4 - 500	NA
HEXACHLOROPROPENE	ug/L	UNF	0/3	0/3	-		4 - 20	NA
IODOMETHANE	ug/L	UNF	0/18	0/18	-		5 - 20	NA
ISODRIN	ug/L	UNF	0/3	0/3	-		0.05 - 4	NA
ISOSAFROLE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
KEPONE	ug/L	UNF	0/3	0/3	-		0.1 - 4	NA
LINURON	ug/L	UNF	0/8	0/8	-		1000 - 1000	NA
METHACRYLONITRILE	ug/L	UNF	0/18	0/18	-		5 - 20	NA
METHAPYRILENE	ug/L	UNF	0/3	0/3	-		15 - 40	NA
METHYL METHACRYLATE	ug/L	UNF	0/18	0/18	-		5 - 20	NA
METHYL METHANESULFONATE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
METOLACHLOR	ug/L	UNF	0/8	0/8	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/8	0/8	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/3	0/3	-		4 - 20	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/3	0/3	-		4 - 10	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/3	0/3	-		4 - 10	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/3	0/3	-		15 - 30	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/3	0/3	-		15 - 50	NA
PENTACHLOROBENZENE	ug/L	UNF	0/3	0/3	-		4 - 20	NA

TABLE E.2-2
SUMMARY STATISTICS FOR FEMP TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
PENTACHLOROETHANE	ug/L	UNF	0/18	0/18	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/3	0/3	-		4 - 20	NA
PHENACETIN	ug/L	UNF	0/3	0/3	-		4 - 10	NA
PRONAMIDE	ug/L	UNF	0/3	0/3	-		15 - 30	NA
SAFROLE	ug/L	UNF	0/3	0/3	-		10 - 15	NA
SIMIZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TERBUFOS	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/45	0/45	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/17	0/17	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000201

TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	13/18	3/18	0.5	.3 - 1.6	.3 - .6	0.9
URANIUM-238	pCi/L	UNF	4/24	1/24	-	.5 - .7	.2 - 1	0.64
URANIUM, TOTAL	ug/L	FIL	8/19	2/19	-	.2 - 2.4	.1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	17/25	4/25	0.3	.2 - 103	.1 - 1	1.2
URANIUM-234	pCi/L	FIL	13/18	4/18	0.55	.4 - 2	.3 - .6	0.9
URANIUM-234	pCi/L	UNF	14/24	3/24	0.5	.4 - 2.24	.2 - 1	0.8
THORIUM-230	pCi/L	FIL	5/18	5/18	-	.3 - .6	.2 - 1	0.29
THORIUM-230	pCi/L	UNF	11/24	0/24	-	.3 - .5	.2 - 2.4	0.89
RADIUM-226	pCi/L	FIL	4/18	0/18	-	1.1 - 1.7	1 - 1	1.9
RADIUM-226	pCi/L	UNF	2/24	0/24	-	1.1 - 1.2	.6 - 1	105
URANIUM-235/236	pCi/L	FIL	0/18	0/18	-		.2 - 1	ND
URANIUM-235/236	pCi/L	UNF	0/24	0/24	-		.2 - 1	0.094
THORIUM-232	pCi/L	FIL	5/18	5/18	-	.4 - 2.4	.2 - 1	0.3
THORIUM-232	pCi/L	UNF	4/24	4/24	-	.3 - 2.4	.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	8/8	3/8	2.3	.912 - 10.944		2.8
THORIUM, TOTAL	ug/L	UNF	14/21	9/21	1.8	.9 - 21.888	1.7 - 8.6	0.97
RADIUM-228	pCi/L	FIL	0/18	0/18	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	1/24	0/24	-	3.1 - 3.1	3 - 3.1	3.6
THORIUM-228	pCi/L	FIL	1/18	0/18	-	.3 - .3	.2 - 1	0.4
THORIUM-228	pCi/L	UNF	0/24	0/24	-		.2 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	0/1	0/1	-		1 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/18	0/18	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/1	0/1	-		1 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/20	0/20	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/1	0/1	-		1 - 1	ND
PLUTONIUM-238	pCi/L	UNF	0/20	0/20	-		.5 - 1.6	0.048
STRONTIUM-90	pCi/L	FIL	1/2	1/2	-	2.5 - 2.5	5 - 5	ND
STRONTIUM-90	pCi/L	UNF	1/20	1/20	-	1.7 - 1.7	1 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/2	0/2	-		15 - 30	ND
TECHNETIUM-99	pCi/L	UNF	0/24	0/24	-		15 - 38.3	ND
RUTHENIUM-106	pCi/L	FIL	0/1	0/1	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/18	0/18	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/2	0/2	-		5.4 - 20	ND
CESIUM-137	pCi/L	UNF	0/20	0/20	-		4 - 20	ND
GROSS ALPHA	pCi/L	FIL	6/18	6/18	-	1.7 - 8.4	0 - 4.6	NA
GROSS ALPHA	pCi/L	UNF	9/22	9/22	-	.3 - 51.1	.7 - 7.7	NA
GROSS BETA	pCi/L	FIL	8/18	8/18	-	2.6 - 8.2	.4 - 3.5	NA
GROSS BETA	pCi/L	UNF	16/22	16/22	4.4	1.1 - 67.7	1.9 - 3.9	NA
URANIUM-235	pCi/L	UNF	0/3	0/3	-		.007 - 1	NA
URANIUM-236	pCi/L	UNF	0/1	0/1	-		.004 - .004	NA
ALUMINUM	mg/L	FIL	2/21	1/21	-	.106 - .206	.014 - .06	0.175
ALUMINUM	mg/L	UNF	4/22	1/22	-	.0213 - 2.06	.014 - .097	0.225
ANTIMONY	mg/L	FIL	0/20	0/20	-		.03 - .045	ND
ANTIMONY	mg/L	UNF	0/21	0/21	-		.027 - .045	ND
ARSENIC	mg/L	FIL	13/22	0/22	0.002	.0014 - .0246	.001 - .003	0.26
ARSENIC	mg/L	UNF	16/22	0/22	0.003	.0012 - .0276	.001 - .0116	0.0294
BARIUM	mg/L	FIL	19/22	0/22	0.065	.032 - .56	.0231 - .613	0.669
BARIUM	mg/L	UNF	19/22	0/22	0.063	.0283 - .621	.0231 - .0729	0.768
BERYLLIUM	mg/L	FIL	0/20	0/20	-		.001 - .003	0.0022
BERYLLIUM	mg/L	UNF	0/21	0/21	-		.001 - .0013	ND
CADMIUM	mg/L	FIL	2/22	0/22	-	.0031 - .0044	.002 - .005	0.006
CADMIUM	mg/L	UNF	2/22	0/22	-	.003 - .0037	.002 - .003	0.0135
CALCIUM	mg/L	FIL	21/22	3/22	91	6.16 - 176	129 - 129	136

000202

TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	UNF	22/22	2/22	91	74.3 - 190		159
CHROMIUM	mg/L	FIL	3/22	2/22	-	.008 - .0308	.003 - .019	0.03
CHROMIUM	mg/L	UNF	3/22	2/22	-	.0076 - .142	.003 - .0214	0.0211
COBALT	mg/L	FIL	0/20	0/20	-		.005 - .02	ND
COBALT	mg/L	UNF	2/21	0/21	-	.0058 - .0076	.005 - .0095	0.0086
COPPER	mg/L	FIL	6/22	0/22	-	.0048 - .03	.004 - .0106	0.083
COPPER	mg/L	UNF	2/22	0/22	-	.01 - .03	.003 - .0154	0.0354
CYANIDE	mg/L	FIL	0/18	0/18	-		0 - .02	ND
CYANIDE	mg/L	UNF	0/21	0/21	-		.005 - .02	ND
IRON	mg/L	FIL	20/22	4/22	2.7	.03 - 15.9	.01 - 5.41	4.14
IRON	mg/L	UNF	22/22	4/22	2.8	.018 - 16.9		5.72
LEAD	mg/L	FIL	5/22	1/22	-	.001 - .0132	.001 - .002	0.009
LEAD	mg/L	UNF	5/22	4/22	-	.0014 - .0133	.001 - .0021	0.002
MAGNESIUM	mg/L	FIL	22/22	4/22	24	.463 - 55.7		37.8
MAGNESIUM	mg/L	UNF	22/22	4/22	24	19.2 - 66		38.5
MANGANESE	mg/L	FIL	21/22	2/22	0.313	.0604 - 1.11	.005 - .005	0.78
MANGANESE	mg/L	UNF	22/22	2/22	0.294	.004 - .939		0.904
MERCURY	mg/L	FIL	0/22	0/22	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	1/22	1/22	-	.0002 - .0002	.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	3/18	0/18	-	.0035 - .01	.003 - .02	0.025
MOLYBDENUM	mg/L	UNF	1/12	1/12	-	.01 - .01	.01 - .025	ND
NICKEL	mg/L	FIL	0/22	0/22	-		.01 - .0351	0.023
NICKEL	mg/L	UNF	3/22	1/22	-	.02 - .117	.01 - .031	0.0514
POTASSIUM	mg/L	FIL	16/22	0/22	1.49	.913 - 3.29	.693 - 2.06	3.32
POTASSIUM	mg/L	UNF	13/22	4/22	1.07	.483 - 2.78	.82 - 2.68	1.96
SELENIUM	mg/L	FIL	2/22	0/22	-	.0011 - .0015	.001 - .005	0.004
SELENIUM	mg/L	UNF	4/22	4/22	-	.0013 - .0028	.001 - .0026	0.00075
SILICON	mg/L	FIL	6/6	5/6	-	.086 - 6.43		3.46
SILICON	mg/L	UNF	1/1	0/1	-	4.91 - 4.91		5.81
SILVER	mg/L	FIL	1/22	1/22	-	.0232 - .0232	.003 - .01	0.0138
SILVER	mg/L	UNF	1/22	1/22	-	.023 - .023	.003 - .007	0.0117
SODIUM	mg/L	FIL	22/22	1/22	13.4	3.81 - 71.5		55
SODIUM	mg/L	UNF	22/22	2/22	14.5	3.76 - 74.6		47.1
THALLIUM	mg/L	FIL	0/20	0/20	-		.001 - .01	ND
THALLIUM	mg/L	UNF	0/21	0/21	-		.001 - .01	ND
TIN	mg/L	FIL	0/1	0/1	-		1 - 1	NA
TIN	mg/L	UNF	0/1	0/1	-		1 - 1	NA
VANADIUM	mg/L	FIL	1/21	0/21	-	.0143 - .0143	.003 - .01	0.0234
VANADIUM	mg/L	UNF	2/22	0/22	-	.0051 - .011	.003 - .007	0.0117
ZINC	mg/L	FIL	5/20	1/20	-	.0045 - .0766	.002 - .0206	0.0568
ZINC	mg/L	UNF	3/21	1/21	-	.0084 - .0474	.0028 - .0511	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/6	0/6	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
2-BUTANONE	ug/L	UNF	2/21	2/21	-	24 - 88	10 - 110	NA
2-HEXANONE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/21	0/21	-		10 - 10	NA

000203

TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ACETONE	ug/L	UNF	0/21	0/21	-		10 - 12	NA
BENZENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
BROMOFORM	ug/L	UNF	0/21	0/21	-		10 - 10	NA
BROMOMETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
CARBON DISULFIDE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
CHLOROETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
CHLOROFORM	ug/L	UNF	0/21	0/21	-		10 - 10	NA
CHLOROMETHANE	ug/L	UNF	1/21	1/21	-	12 - 12	10 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/1	0/1	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
STYRENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/1	0/1	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
TOLUENE	ug/L	UNF	3/21	3/21	-	1 - 8	10 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/22	0/22	-		10 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/6	0/6	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/15	0/15	-		2 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/21	0/21	-		10 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/21	0/21	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2,4-DINITROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/7	0/7	-		10 - 15	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/7	0/7	-		10 - 15	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/15	0/15	-		10 - 10	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2-CHLOROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
2-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
2-NITROANILINE	ug/L	UNF	0/7	0/7	-		15 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/7	0/7	-		10 - 20	NA
3-NITROANILINE	ug/L	UNF	0/7	0/7	-		15 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/7	0/7	-		10 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/7	0/7	-		10 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/5	0/5	-		10 - 10	NA
4-NITROANILINE	ug/L	UNF	0/7	0/7	-		15 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 50	NA

TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ACENAPHTHENE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
ACENAPHTHYLENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
ANTHRACENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
BENZO(A)PYRENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
BENZOIC ACID	ug/L	UNF	0/4	0/4	-		4 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/4	0/4	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/7	0/7	-		10 - 15	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/7	0/7	-		10 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/7	0/7	-		4 - 15	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	2/7	2/7	-	5 - 12	4 - 10	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
CARBAZOLE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CHRYSENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
CUMENE	ug/L	UNF	0/6	0/6	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	1/7	1/7	-	20 - 20	4 - 10	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
DIBENZOFURAN	ug/L	UNF	0/7	0/7	-		4 - 10	NA
DIETHYL PHTHALATE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
FLUORANTHENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
FLUORENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
HEXACHLOROBENZENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
HEXACHLOROETHANE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
ISOPHORONE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
NAPHTHALENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
NITROBENZENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
PENTACHLOROPHENOL	ug/L	UNF	0/7	0/7	-		4 - 50	NA
PHENANTHRENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
PHENOL	ug/L	UNF	0/7	0/7	-		4 - 10	NA
PYRENE	ug/L	UNF	0/7	0/7	-		4 - 10	NA
PYRIDINE	ug/L	UNF	0/3	0/3	-		4 - 4	NA
4,4'-DDD	ug/L	UNF	0/6	0/6	-		.1 - 4	NA
4,4'-DDE	ug/L	UNF	0/6	0/6	-		.1 - 4	NA
4,4'-DDT	ug/L	UNF	0/6	0/6	-		.1 - 4	NA
ALDRIN	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
ALPHA-BHC	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
ALPHA-CHLORDANE	ug/L	UNF	0/3	0/3	-		.05 - .5	NA
AROCLOR-1016	ug/L	UNF	0/6	0/6	-		.2 - 1	NA
AROCLOR-1221	ug/L	UNF	0/6	0/6	-		.2 - 2	NA
AROCLOR-1232	ug/L	UNF	0/6	0/6	-		.2 - 1	NA
AROCLOR-1242	ug/L	UNF	0/6	0/6	-		.2 - 1	NA

000205

TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
AROCLOR-1248	ug/L	UNF	0/6	0/6	-		.2 - 1	NA
AROCLOR-1254	ug/L	UNF	0/6	0/6	-		.2 - 1	NA
AROCLOR-1260	ug/L	UNF	0/6	0/6	-		.2 - 1	NA
BETA-BHC	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
CHLORDANE	ug/L	UNF	0/3	0/3	-		.2 - .2	NA
CHLOROBENZILATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
DIELDRIN	ug/L	UNF	0/6	0/6	-		.1 - .2	NA
ENDOSULFAN II	ug/L	UNF	0/6	0/6	-		.1 - .2	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/6	0/6	-		.1 - .2	NA
ENDOSULFAN-I	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
ENDRIN	ug/L	UNF	0/9	0/9	-		.08 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/5	0/5	-		.1 - .2	NA
ENDRIN KETONE	ug/L	UNF	0/3	0/3	-		.1 - .1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/9	0/9	-		.05 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/3	0/3	-		.05 - .5	NA
HEPTACHLOR	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/6	0/6	-		.05 - .2	NA
METHOXYCHLOR	ug/L	UNF	0/8	0/8	-		.2 - 200	NA
SULFOTEP	ug/L	UNF	0/1	0/1	-		15 - 15	NA
TOXAPHENE	ug/L	UNF	0/9	0/9	-		.5 - 500	NA
2,4,5-T	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/6	0/6	-		.5 - 500	NA
2,4-D	ug/L	UNF	0/6	0/6	-		1 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DEMETON	ug/L	UNF	0/1	0/1	-		.25 - .25	NA
DIAZINON	ug/L	UNF	0/1	0/1	-		.25 - .25	NA
DIMETHOATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DISULFOTON	ug/L	UNF	0/2	0/2	-		.25 - 15	NA
ETHION	ug/L	UNF	0/1	0/1	-		.25 - .25	NA
FAMPHUR	ug/L	UNF	0/1	0/1	-		15 - 15	NA
MALATHION	ug/L	UNF	0/1	0/1	-		.25 - .25	NA
METHYL PARATHION	ug/L	UNF	0/2	0/2	-		.25 - 15	NA
PARATHION	ug/L	UNF	0/2	0/2	-		.25 - 15	NA
PHORATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
THIONAZIN	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-DIOXANE	ng/L	UNF	0/1	0/1	-		5000 - 5000	NA
ALKALINITY AS CACO3	mg/L	UNF	21/21	21/21	300	230 - 482		NA
ALLYL CHLORIDE	-	UNF	0/6	0/6	-		5 - 5	NA
AMMONIA	mg/L	UNF	21/24	1/24	0.26	.05 - 4.56	.05 - .2	4.2
BICARBONATE	-	UNF	8/8	8/8	255	157 - 390		NA
BICARBONATE ALKALINITY	-	UNF	21/21	21/21	348	280 - 604		NA
CARBONATE ALKALINITY	-	UNF	0/21	0/21	-		3 - 30	NA
CHEMICAL OXYGEN DEMAND	-	UNF	0/5	0/5	-		10 - 10	NA
CHLORIDE	mg/L	UNF	24/24	3/24	24	2.63 - 190		73
FLUORIDE	mg/L	UNF	22/24	0/24	0.21	.1 - .6	.15 - .15	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	0/5	0/5	-		.005 - .005	NA
NITRATE	mg/L	UNF	7/18	0/18	-	.04 - 7.2	.02 - .103	11.4
NITRATE, AS NITROGEN	mg/L	UNF	6/14	6/14	-	.02 - .39	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	5/21	0/21	-	.03 - .59	.02 - .05	4.1
NITRITE, AS NITROGEN	mg/L	UNF	1/6	1/6	-	.04 - .04	.02 - .02	NA
PH	-	UNF	21/21	21/21	7.6	7.43 - 8.05		NA
PHENOLS	mg/L	UNF	1/24	0/24	-	.008 - .008	.002 - .15	0.03

000206
6161

TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
PHOSPHATE	mg/L	UNF	3/3	3/3	0.16	.16 - .22		NA
PHOSPHORUS	mg/L	UNF	19/24	19/24	0.156	.042 - .45	.01 - .306	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	21/21	21/21	633	470 - 1840		NA
SULFATE	mg/L	UNF	24/24	1/24	61	4 - 224		197
SULFIDE	mg/L	UNF	4/8	4/8	9	17.4 - 40	.2 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	16/16	1/16	374	164 - 922		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	19/21	2/21	0.45	.12 - 4.21	.3 - 2.7	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	16/23	5/23	1.7	1 - 9	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	6/24	1/24	-	.01 - .067	.01 - .05	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	3/17	3/17	-	.013 - .028	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	9/24	0/24	-	.1 - .79	-.34 - .5	0.9
TOTAL SOLIDS	mg/L	UNF	21/21	3/21	440	300 - 1220		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/6	0/6	-		2 - 2	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/6	0/6	-		2 - 2	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-PICOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLPHENOL	ug/L	UNF	0/3	0/3	-		4 - 4	NA
4-AMINOBIPHENYL	ug/L	UNF	0/1	0/1	-		15 - 15	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACETONITRILE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACROLEIN	ug/L	UNF	0/6	0/6	-		50 - 50	NA
ACROLEIN	ug/L	UNF	0/6	0/6	-		50 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/6	0/6	-		50 - 50	NA
ALACHLOR	ug/L	UNF	0/5	0/5	-		2000 - 2000	NA
ANILINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ARAMITE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ATRAZINE	ug/L	UNF	0/5	0/5	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/5	0/5	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/5	0/5	-		1000 - 1000	NA
DIALLATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/6	0/6	-		10 - 10	NA
DINOSEB	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DIPHENYLAMINE	ug/L	UNF	0/3	0/3	-		15 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/6	0/6	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA

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TABLE E.2-3
SUMMARY STATISTICS FOR FEMP TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
FONOFOS	ug/L	UNF	0/5	0/5	-		1000 - 1000	NA
HEXACHLOROPHENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
HEXACHLOROPROPENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
IODOMETHANE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
ISODRIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ISOSAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
KEPONE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
LINURON	ug/L	UNF	0/5	0/5	-		1000 - 1000	NA
METHACRYLONITRILE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
METHAPYRILENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METHYL METHACRYLATE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
METHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METOLACHLOR	ug/L	UNF	0/5	0/5	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/5	0/5	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
PENTACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PENTACHLOROETHANE	ug/L	UNF	0/6	0/6	-		5 - 5	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PHENACETIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PRONAMIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
SAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/15	0/15	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/6	0/6	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000308
616

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	15/20	12/20	1.8	.24 - 108	.2 - .5	0.9
URANIUM-238	pCi/L	UNF	21/25	16/25	1.5	.301 - 20.6	.2 - .2	0.64
URANIUM, TOTAL	ug/L	FIL	17/20	15/20	5.6	.3 - 65.9	.1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	23/25	18/25	4.3	.2 - 64.7	.1 - 1	1.2
URANIUM-234	pCi/L	FIL	14/20	12/20	1.9	.27 - 84.4	.2 - .6	0.9
URANIUM-234	pCi/L	UNF	21/25	17/25	1.7	.268 - 28.7	.2 - .4	0.8
THORIUM-230	pCi/L	FIL	3/20	3/20	-	.3 - .6	.2 - .301	0.29
THORIUM-230	pCi/L	UNF	9/25	0/25	-	.3 - .712	.2 - 1.72	0.89
RADIUM-226	pCi/L	FIL	7/20	2/20	-	1.2 - 4.1	1 - 1	1.9
RADIUM-226	pCi/L	UNF	1/25	0/25	-	1.34 - 1.34	.5 - 1	105
URANIUM-235/236	pCi/L	FIL	2/20	2/20	-	.7 - 6.3	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	5/25	5/25	-	.277 - 1.1	.2 - 1	0.094
THORIUM-232	pCi/L	FIL	2/20	2/20	-	.7 - 1.2	.2 - .4	0.3
THORIUM-232	pCi/L	UNF	2/25	2/25	-	.7 - 1.2	.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	8/11	0/11	0.912	.912 - 1.824	.5 - 1.07	2.8
THORIUM, TOTAL	ug/L	UNF	13/25	7/25	0.912	0 - 10.944	.5 - 5	0.97
RADIUM-228	pCi/L	FIL	0/20	0/20	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	1/25	1/25	-	4.31 - 4.31	1.5 - 3	3.6
THORIUM-228	pCi/L	FIL	2/20	0/20	-	.3 - .3	.2 - .3	0.4
THORIUM-228	pCi/L	UNF	1/25	1/25	-	1.22 - 1.22	.2 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	0/7	0/7	-		.5 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/23	0/23	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/8	0/8	-		.5 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/25	0/25	-		.0431 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	1/8	1/8	-	.89 - .89	.5 - 1	ND
PLUTONIUM-238	pCi/L	UNF	0/25	0/25	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	1/7	1/7	-	1.4 - 1.4	1 - 5	ND
STRONTIUM-90	pCi/L	UNF	7/24	7/24	-	1.37 - 32.3	1 - 5	ND
TECHNETIUM-99	pCi/L	FIL	3/9	3/9	-	35.7 - 204	15 - 30	ND
TECHNETIUM-99	pCi/L	UNF	6/22	6/22	-	193 - 2110	15 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/5	0/5	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/23	0/23	-		150 - 155	ND
CESIUM-137	pCi/L	FIL	0/6	0/6	-		4 - 20	ND
CESIUM-137	pCi/L	UNF	0/24	0/24	-		4 - 20	ND
GROSS ALPHA	pCi/L	FIL	8/20	8/20	-	2.9 - 49.3	2 - 11.71	NA
GROSS ALPHA	pCi/L	UNF	17/25	17/25	6.4	3.9 - 49.9	2.4 - 18.5	NA
GROSS BETA	pCi/L	FIL	16/20	16/20	8.4	3.6 - 488	2.7 - 10.2	NA
GROSS BETA	pCi/L	UNF	16/25	16/25	9.0	4.1 - 1080	2.4 - 7.58	NA
URANIUM-235	pCi/L	FIL	1/1	1/1	-	.1 - .1		NA
URANIUM-235	pCi/L	UNF	2/7	2/7	-	.0533 - .1	1 - 1	NA
URANIUM-236	pCi/L	UNF	1/1	1/1	-	.0087 - .0087		NA
ALUMINUM	mg/L	FIL	4/22	2/22	-	.0132 - .303	.014 - .24	0.175
ALUMINUM	mg/L	UNF	6/24	4/24	-	.0634 - 1.23	.014 - .327	0.225
ANTIMONY	mg/L	FIL	0/22	0/22	-		.001 - .0467	ND
ANTIMONY	mg/L	UNF	1/24	1/24	-	.0029 - .0029	.005 - .045	ND
ARSENIC	mg/L	FIL	3/22	0/22	-	.001 - .01	.001 - .005	0.26
ARSENIC	mg/L	UNF	6/24	0/24	-	.0019 - .0083	.001 - .005	0.0294
BARIUM	mg/L	FIL	20/22	0/22	0.70	.0401 - .129	.2 - .2	0.669
BARIUM	mg/L	UNF	22/24	0/24	0.078	.0421 - .132	.2 - .2	0.768
BERYLLIUM	mg/L	FIL	0/22	0/22	-		.001 - .005	0.0022
BERYLLIUM	mg/L	UNF	0/24	0/24	-		.001 - .005	ND
CADMIUM	mg/L	FIL	3/22	0/22	-	.0022 - .0053	.001 - .0051	0.006
CADMIUM	mg/L	UNF	1/24	0/24	-	.0032 - .0032	.001 - .0051	0.0135

000209

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	FIL	21/22	11/22	136	86.9 - 332	140 - 140	136
CALCIUM	mg/L	UNF	24/24	9/24	141	86.7 - 326		159
CHROMIUM	mg/L	FIL	3/22	1/22	-	.0073 - .03	.003 - .033	0.03
CHROMIUM	mg/L	UNF	5/24	0/24	-	.0036 - .0198	.003 - .0192	0.0211
COBALT	mg/L	FIL	1/22	1/22	-	.0113 - .0113	.003 - .0279	ND
COBALT	mg/L	UNF	1/24	0/24	-	.0081 - .0081	.005 - .01	0.0086
COPPER	mg/L	FIL	1/22	0/22	-	.0063 - .0063	.003 - .02	0.083
COPPER	mg/L	UNF	3/24	1/24	-	.0052 - .176	.003 - .02	0.0354
CYANIDE	mg/L	FIL	0/18	0/18	-		0 - .02	ND
CYANIDE	mg/L	UNF	1/25	1/25	-	.044 - .044	0 - .02	ND
IRON	mg/L	FIL	14/22	3/22	1.33	.08 - 6.13	.012 - .1	4.14
IRON	mg/L	UNF	21/24	5/24	3.15	.0672 - 26.7	.012 - .382	5.72
LEAD	mg/L	FIL	2/22	0/22	-	.0012 - .0026	.001 - .005	0.009
LEAD	mg/L	UNF	6/24	4/24	-	.0012 - .0415	.001 - .003	0.002
MAGNESIUM	mg/L	FIL	22/22	7/22	29.3	22.3 - 158		37.8
MAGNESIUM	mg/L	UNF	24/24	6/24	29.9	22.1 - 154		38.5
MANGANESE	mg/L	FIL	19/22	1/22	0.265	.0106 - 1.02	.005 - .0072	0.78
MANGANESE	mg/L	UNF	24/24	1/24	0.293	.0014 - .932		0.904
MERCURY	mg/L	FIL	0/22	0/22	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/24	0/24	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	2/21	1/21	-	.01 - .327	.0056 - .025	0.025
MOLYBDENUM	mg/L	UNF	1/21	1/21	-	.435 - .435	.001 - .025	ND
NICKEL	mg/L	FIL	2/22	2/22	-	.024 - .0241	.003 - .031	0.023
NICKEL	mg/L	UNF	3/24	0/24	-	.023 - .0509	.01 - .031	0.0514
OSMIUM	mg/L	FIL	0/3	0/3	-		.05 - .05	NA
OSMIUM	mg/L	UNF	0/1	0/1	-		.05 - .05	NA
POTASSIUM	mg/L	FIL	21/22	10/22	3.26	1.24 - 29.7	2.07 - 2.07	3.32
POTASSIUM	mg/L	UNF	22/24	19/24	3.23	1.01 - 31.4	.82 - 1.2	1.96
SELENIUM	mg/L	FIL	1/22	0/22	-	.002 - .002	.001 - .005	0.004
SELENIUM	mg/L	UNF	4/24	4/24	-	.001 - .0022	.001 - .005	0.00075
SILICON	mg/L	FIL	10/10	10/10	5.84	3.51 - 6.62		3.46
SILICON	mg/L	UNF	4/4	4/4	6.49	6.22 - 8.1		5.81
SILVER	mg/L	FIL	0/22	0/22	-		.001 - .01	0.0138
SILVER	mg/L	UNF	2/24	0/24	-	.003 - .0042	.001 - .01	0.0117
SODIUM	mg/L	FIL	22/22	4/22	16.7	10.5 - 118		55
SODIUM	mg/L	UNF	24/24	4/24	15.3	11.3 - 115		47.1
THALLIUM	mg/L	FIL	0/22	0/22	-		.001 - .01	ND
THALLIUM	mg/L	UNF	1/24	1/24	-	.0011 - .0011	.001 - .01	ND
TIN	mg/L	FIL	0/8	0/8	-		.03 - 1	NA
TIN	mg/L	UNF	0/4	0/4	-		.03 - 1	NA
VANADIUM	mg/L	FIL	0/22	0/22	-		.003 - .05	0.0234
VANADIUM	mg/L	UNF	0/24	0/24	-		.003 - .05	0.0117
ZINC	mg/L	FIL	7/22	0/22	-	.0027 - .042	.002 - .0339	0.0568
ZINC	mg/L	UNF	6/24	3/24	-	.0117 - .063	.005 - .02	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/14	0/14	-		1 - 5	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	1/25	1/25	-	10 - 10	1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	1/25	1/25	-	5 - 5	1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	1/25	1/25	-	5 - 5	1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA

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619

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2-BUTANONE	ug/L	UNF	1/25	1/25	-	34 - 34	2 - 10	NA
2-HEXANONE	ug/L	UNF	0/25	0/25	-		2 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/25	0/25	-		2 - 10	NA
ACETONE	ug/L	UNF	1/25	1/25	-	2 - 2	2 - 36	NA
BENZENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
BROMOFORM	ug/L	UNF	0/25	0/25	-		1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	2/25	2/25	-	2 - 2	1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
CHLOROFORM	ug/L	UNF	1/25	1/25	-	1 - 1	1 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/7	0/7	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	0/25	0/25	-		1 - 100	NA
STYRENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/3	0/3	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
TOLUENE	ug/L	UNF	1/25	1/25	-	.8 - .8	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	1/25	1/25	-	120 - 120	1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	1/14	1/14	-	66 - 66	1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/22	0/22	-		2 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/25	0/25	-		1 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/25	0/25	-		1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/22	0/22	-		4 - 10	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/20	0/20	-		10 - 10	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/22	0/22	-		4 - 10	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA
2,4-DINITROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/22	0/22	-		10 - 15	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/23	0/23	-		10 - 15	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/18	0/18	-		10 - 10	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
2-CHLOROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/22	0/22	-		4 - 10	NA
2-METHYLPHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA
2-NITROANILINE	ug/L	UNF	0/23	0/23	-		15 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/23	0/23	-		10 - 20	NA
3-NITROANILINE	ug/L	UNF	0/23	0/23	-		15 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/23	0/23	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/23	0/23	-		10 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA

000211

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/23	0/23	-		10 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/20	0/20	-		10 - 10	NA
4-NITROANILINE	ug/L	UNF	0/23	0/23	-		15 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 50	NA
ACENAPHTHENE	ug/L	UNF	0/22	0/22	-		4 - 10	NA
ACENAPHTHYLENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
ANTHRACENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
BENZO(A)PYRENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
BENZOIC ACID	ug/L	UNF	0/22	0/22	-		4 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/22	0/22	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/23	0/23	-		10 - 15	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/23	0/23	-		10 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/23	0/23	-		4 - 15	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	2/23	2/23	-	1 - 2	4 - 10	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	4/23	4/23	-	1 - 2	4 - 10	NA
CARBAZOLE	ug/L	UNF	0/15	0/15	-		10 - 10	NA
CHRYSENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
CUMENE	ug/L	UNF	0/13	0/13	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/22	0/22	-		4 - 10	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
DIBENZOFURAN	ug/L	UNF	0/23	0/23	-		4 - 10	NA
DIETHYL PHTHALATE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
FLUORANTHENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
FLUORENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
HEXACHLOROBENZENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
HEXACHLOROETHANE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
ISOPHORONE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/8	0/8	-		4 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/23	0/23	-		4 - 50	NA
NAPHTHALENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
NITROBENZENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
O,O,O-TRIETHYLPHOSPHOROTHIOATE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
PENTACHLOROPHENOL	ug/L	UNF	0/23	0/23	-		4 - 50	NA
PHENANTHRENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
PHENOL	ug/L	UNF	0/23	0/23	-		4 - 10	NA
PYRENE	ug/L	UNF	0/23	0/23	-		4 - 10	NA
PYRIDINE	ug/L	UNF	0/9	0/9	-		4 - 50000	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
4,4'-DDD	ug/L	UNF	0/21	0/21	-		.1 - 4	NA
4,4'-DDE	ug/L	UNF	0/21	0/21	-		.1 - 4	NA
4,4'-DDT	ug/L	UNF	0/21	0/21	-		.1 - 4	NA
ALDRIN	ug/L	UNF	1/21	1/21	-	.11 - .11	.05 - 1	NA

000212
6161

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ALPHA-BHC	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
ALPHA-CHLORDANE	ug/L	UNF	0/17	0/17	-		.05 - 1	NA
AROCLOR-1016	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
AROCLOR-1221	ug/L	UNF	0/21	0/21	-		.2 - 2	NA
AROCLOR-1232	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
AROCLOR-1242	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
AROCLOR-1248	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
AROCLOR-1254	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
AROCLOR-1260	ug/L	UNF	0/21	0/21	-		.2 - 1	NA
BETA-BHC	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
CHLORDANE	ug/L	UNF	0/11	0/11	-		.2 - 1	NA
CHLOROBENZILATE	ug/L	UNF	0/3	0/3	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
DIELDRIN	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
ENDOSULFAN II	ug/L	UNF	1/21	1/21	-	.15 - .15	.1 - 1	NA
ENDOSULFAN SULFATE	ug/L	UNF	1/21	1/21	-	2.6 - 2.6	.1 - 1	NA
ENDOSULFAN-I	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
ENDRIN	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/19	0/19	-		.1 - 1	NA
ENDRIN KETONE	ug/L	UNF	0/17	0/17	-		.1 - .5	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
GAMMA-CHLORDANE	ug/L	UNF	0/17	0/17	-		.05 - .5	NA
HEPTACHLOR	ug/L	UNF	1/21	1/21	-	.07 - .07	.05 - 1	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/21	0/21	-		.05 - 1	NA
METHOXYCHLOR	ug/L	UNF	0/20	0/20	-		.2 - 1	NA
SULFOTEP	ug/L	UNF	0/5	0/5	-		1 - 500	NA
TOXAPHENE	ug/L	UNF	0/21	0/21	-		.5 - 5	NA
2,4,5-T	ug/L	UNF	0/8	0/8	-		.25 - 5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/8	0/8	-		.025 - 2.5	NA
2,4-D	ug/L	UNF	0/8	0/8	-		.05 - 5	NA
AZINPHOSMETHYL	ug/L	UNF	0/12	0/12	-		.2 - 2000	NA
DEMETON	ug/L	UNF	0/12	0/12	-		.04 - 1000	NA
DIAZINON	ug/L	UNF	0/12	0/12	-		.02 - 500	NA
DIMETHOATE	ug/L	UNF	0/5	0/5	-		1 - 500	NA
DISULFOTON	ug/L	UNF	0/15	0/15	-		.02 - 500	NA
ETHION	ug/L	UNF	0/12	0/12	-		.02 - 500	NA
FAMPHUR	ug/L	UNF	0/5	0/5	-		1 - 500	NA
MALATHION	ug/L	UNF	0/12	0/12	-		.02 - 1000	NA
METHYL PARATHION	ug/L	UNF	0/15	0/15	-		.04 - 500	NA
PARATHION	ug/L	UNF	0/15	0/15	-		.02 - 1000	NA
PHORATE	ug/L	UNF	0/5	0/5	-		1 - 500	NA
THIONAZIN	ug/L	UNF	0/5	0/5	-		1 - 500	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.67 - 1.1	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.51 - 4.8	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.66 - 1.6	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.92 - 1.2	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.25 - .5	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.87 - 1.1	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.23 - .46	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.8 - 1	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.39 - 2.3	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/3	0/3	-		.69 - 1.9	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.41 - .74	NA

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
1,4-DIOXANE	ng/L	UNF	0/7	0/7	-		1000 - 5000	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.34 - 1.2	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN	ng/L	UNF	0/3	0/3	-		.41 - .71	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/7	0/7	-		.39 - 2.5	NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ng/L	UNF	0/5	0/5	-		.33 - 3.2	NA
HEPTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/7	0/7	-		.18 - 1.8	NA
HEPTACHLORODIBENZOFURANS	ng/L	UNF	0/7	0/7	-		.28 - 5.3	NA
HEXACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/9	0/9	-		.1 - 3.5	NA
HEXACHLORODIBENZOFURANS	ng/L	UNF	1/9	1/9	-	.38 - .38	.11 - 2.1	NA
OCTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	1/7	1/7	-	.7 - .7	.33 - 6.4	NA
OCTACHLORODIBENZOFURAN	ng/L	UNF	0/7	0/7	-		.02 - 6	NA
PENTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/9	0/9	-		.13 - 2.1	NA
PENTACHLORODIBENZOFURANS	ng/L	UNF	1/9	1/9	-	.31 - .31	.11 - 1.3	NA
TETRACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/9	0/9	-		.082 - 2.3	NA
TETRACHLORODIBENZOFURANS	ng/L	UNF	1/9	1/9	-	.22 - .22	.22 - 1.7	NA
ALKALINITY AS CACO3	mg/L	UNF	25/25	25/25	280	222 - 460		NA
ALLYL CHLORIDE	-	UNF	0/13	0/13	-		5 - 5	NA
AMMONIA	mg/L	UNF	18/25	2/25	-	.052 - 17	.02 - .1	4.2
BICARBONATE ALKALINITY	-	UNF	17/17	17/17	340	280 - 540		NA
CARBONATE ALKALINITY	-	UNF	0/17	0/17	-		1 - 30	NA
CHLORIDE	mg/L	UNF	25/25	7/25	38	19 - 340		73
FLUORIDE	mg/L	UNF	23/25	1/25	0.24	.15 - 1.36	.15 - .15	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	0/2	0/2	-		.01 - .01	NA
NITRATE	mg/L	UNF	15/24	7/24	1.19	.02 - 79.4	.02 - .1	11.4
NITRATE, AS NITROGEN	mg/L	UNF	10/15	10/15	1.9	.03 - 63.6	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	13/21	7/21	0.18	.07 - 210	.02 - .05	4.1
NITRITE, AS NITROGEN	mg/L	UNF	0/13	0/13	-		0 - .02	NA
PH	-	UNF	20/20	20/20	7.3	7 - 7.8		NA
PHENOLS	mg/L	UNF	2/25	0/25	-	.002 - .006	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	4/4	4/4	0.87	.48 - 7.2		NA
PHOSPHORUS	mg/L	UNF	11/25	11/25	-	.03 - .21	.02 - .1	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	20/20	20/20	959	630 - 3400		NA
SULFATE	mg/L	UNF	25/25	6/25	137	55 - 550		197
SULFIDE	mg/L	UNF	2/19	2/19	-	.6 - 13.18	.2 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	15/15	4/15	596	90 - 1480		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	18/21	3/21	0..35	.1 - 8.5	.1 - .1	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	18/25	7/25	1.3	1 - 12	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	6/25	1/25	-	.0104 - .082	.01 - 10	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	3/16	3/16	-	.017 - .088	.01 - 10	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	15/24	2/24	0.12	0 - 1.4	-3.2 - .1	0.9
TOTAL SOLIDS	mg/L	UNF	17/17	17/17	602	390 - 2400		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/14	0/14	-		5 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/14	0/14	-		2 - 10	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/14	0/14	-		2 - 5	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/6	0/6	-		15 - 120	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/6	0/6	-		4 - 10	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/6	0/6	-		4 - 10	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/14	0/14	-		5 - 5	NA

000214

6161

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
2-NAPHTHYLAMINE	ug/L	UNF	0/6	0/6	-		4 - 170	NA
2-PICOLINE	ug/L	UNF	0/6	0/6	-		15 - 70	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/6	0/6	-		15 - 80	NA
3-CHLOROPROPENE	ug/L	UNF	0/4	0/4	-		5 - 5	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/6	0/6	-		15 - 30	NA
3-METHYLPHENOL	ug/L	UNF	0/10	0/10	-		4 - 10	NA
4-AMINOBIPHENYL	ug/L	UNF	0/6	0/6	-		15 - 50	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/6	0/6	-		15 - 20	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/6	0/6	-		15 - 20	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
ACETONITRILE	ug/L	UNF	0/7	0/7	-		200 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
ACROLEIN	ug/L	UNF	0/14	0/14	-		10 - 50	NA
ACROLEIN	ug/L	UNF	0/14	0/14	-		10 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/14	0/14	-		10 - 50	NA
ANILINE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
ARAMITE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
DIALLATE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/7	0/7	-		1 - 10	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/14	0/14	-		10 - 200	NA
DINOSEB	ug/L	UNF	0/8	0/8	-		.5 - 20	NA
DIPHENYLAMINE	ug/L	UNF	0/9	0/9	-		10 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/14	0/14	-		20 - 100	NA
ETHYL METHACRYLATE	ug/L	UNF	0/14	0/14	-		5 - 10	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
HEXACHLOROPHENE	ug/L	UNF	0/6	0/6	-		4 - 500	NA
HEXACHLOROPROPENE	ug/L	UNF	0/6	0/6	-		4 - 20	NA
IODOMETHANE	ug/L	UNF	0/14	0/14	-		5 - 5	NA
ISODRIN	ug/L	UNF	0/6	0/6	-		.05 - 4	NA
ISOSAFROLE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
KEPONE	ug/L	UNF	0/6	0/6	-		.1 - 4	NA
METHACRYLONITRILE	ug/L	UNF	0/14	0/14	-		5 - 10	NA
METHAPYRILENE	ug/L	UNF	0/6	0/6	-		15 - 40	NA
METHYL METHACRYLATE	ug/L	UNF	0/14	0/14	-		5 - 10	NA
METHYL METHANESULFONATE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/6	0/6	-		4 - 20	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/6	0/6	-		4 - 10	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/6	0/6	-		15 - 30	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/6	0/6	-		15 - 50	NA
PENTACHLOROBENZENE	ug/L	UNF	0/6	0/6	-		4 - 20	NA
PENTACHLOROETHANE	ug/L	UNF	0/14	0/14	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/6	0/6	-		4 - 20	NA
PHENACETIN	ug/L	UNF	0/6	0/6	-		4 - 10	NA
PRONAMIDE	ug/L	UNF	0/6	0/6	-		15 - 30	NA
SAFROLE	ug/L	UNF	0/6	0/6	-		10 - 15	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/18	0/18	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/14	0/14	-		20 - 100	NA

000215

TABLE E.2-4
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	10/12	6/12	0.85	.4 - 5.8	.4 - .4	0.9
URANIUM-238	pCi/L	UNF	10/13	9/13	1.09	.5 - 6.3	.3 - .7	0.64
URANIUM, TOTAL	ug/L	FIL	10/12	8/12	7.35	.2 - 29.2	.1 - .1	0.8
URANIUM, TOTAL	ug/L	UNF	12/13	8/13	2.7	.2 - 28.4	.1 - .1	1.2
URANIUM-234	pCi/L	FIL	6/12	6/12	0.85	.9 - 7.5	.4 - .6	0.9
URANIUM-234	pCi/L	UNF	11/13	8/13	1.2	.278 - 7.2	.5 - .5	0.8
THORIUM-230	pCi/L	FIL	3/12	3/12	-	.3 - .7	.2 - .3	0.29
THORIUM-230	pCi/L	UNF	0/12	0/12	-		.2 - 1	0.89
RADIUM-226	pCi/L	FIL	5/12	2/12	-	1.1 - 3.6	.4 - 1	1.9
RADIUM-226	pCi/L	UNF	3/13	0/13	-	1.1 - 1.6	.5 - 1.3	105
URANIUM-235/236	pCi/L	FIL	2/12	2/12	-	.3 - .3	.1 - .2	ND
URANIUM-235/236	pCi/L	UNF	2/13	2/13	-	.3 - .4	.1 - 1	0.094
THORIUM-232	pCi/L	FIL	3/12	3/12	-	.4 - .7	.1 - .4	0.3
THORIUM-232	pCi/L	UNF	3/12	3/12	-	.4 - .7	.2 - .5	0.23
THORIUM, TOTAL	ug/L	FIL	5/8	1/8	0.91	0 - 6.3841	.5 - 5	2.8
THORIUM, TOTAL	ug/L	UNF	7/11	6/11	1	.912 - 6.384	.5 - 6	0.97
RADIUM-228	pCi/L	FIL	0/12	0/12	-		1.7 - 3	ND
RADIUM-228	pCi/L	UNF	1/13	1/13	-	4.4 - 4.4	1.6 - 3.7	3.6
THORIUM-228	pCi/L	FIL	1/12	0/12	-	.3 - .3	.1 - .3	0.4
THORIUM-228	pCi/L	UNF	0/12	0/12	-		.2 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	0/2	0/2	-		1 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/10	0/10	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/4	0/4	-		.5 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/11	0/11	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	1/4	1/4	-	.64 - .64	1 - 1	ND
PLUTONIUM-238	pCi/L	UNF	1/11	1/11	-	.65 - .65	.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/4	0/4	-		1 - 5	ND
STRONTIUM-90	pCi/L	UNF	0/10	0/10	-		1 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/3	0/3	-		15 - 30	ND
TECHNETIUM-99	pCi/L	UNF	0/9	0/9	-		15 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/2	0/2	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/9	0/9	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/3	0/3	-		4 - 20	ND
CESIUM-137	pCi/L	UNF	0/10	0/10	-		4 - 8.2	ND
GROSS ALPHA		FIL	8/12	8/12	4.52	3.6 - 12.5	3.3 - 8.1	NA
GROSS ALPHA		UNF	10/13	10/13	6.3	.6 - 14.2	5.6 - 10.5	NA
GROSS BETA		FIL	10/12	10/12	10.8	6.7 - 25.5	0 - 3.5	NA
GROSS BETA		UNF	9/13	9/13	8.5	1.8 - 27.3	3.6 - 17	NA
URANIUM-235		UNF	2/3	2/3	0.025	.01 - .025	1 - 1	NA
URANIUM-236		UNF	2/2	2/2	0.003	.003 - .0035		NA
ALUMINUM		FIL	0/13	0/13	-		.014 - .05	0.175
ALUMINUM		UNF	3/13	1/13	-	.021 - .467	.014 - .5	0.225
ANTIMONY	mg/L	FIL	0/13	0/13	-		.0222 - .045	ND
ANTIMONY	mg/L	UNF	0/13	0/13	-		.0222 - .045	ND
ARSENIC	mg/L	FIL	5/13	0/13	-	.0019 - .0036	.0012 - .0025	0.26
ARSENIC	mg/L	UNF	6/13	0/13	-	.0019 - .007	.0018 - .003	0.0294
BARIUM	mg/L	FIL	12/13	0/13	0.061	.0329 - .181	.2 - .2	0.669
BARIUM	mg/L	UNF	12/13	0/13	0.06	.0251 - .38	.2 - .2	0.768
BERYLLIUM	mg/L	FIL	1/13	0/13	-	.0012 - .0012	.0003 - .01	0.0022
BERYLLIUM	mg/L	UNF	0/13	0/13	-		.0003 - .01	ND
CADMIUM	mg/L	FIL	0/13	0/13	-		.001 - .003	0.006
CADMIUM	mg/L	UNF	1/13	1/13	-	.0135 - .0135	.001 - .003	0.0135
CALCIUM	mg/L	FIL	13/13	6/13	132	39.2 - 332		136

000217

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	UNF	13/13	7/13	162	43.7 - 308		159
CHROMIUM	mg/L	FIL	2/13	2/13	-	.03 - .032	.003 - .005	0.03
CHROMIUM	mg/L	UNF	1/13	0/13	-	.0152 - .0152	.003 - .005	0.0211
COBALT	mg/L	FIL	0/13	0/13	-		.0053 - .025	ND
COBALT	mg/L	UNF	3/13	2/13	-	.0084 - .0101	.005 - .025	0.0086
COPPER	mg/L	FIL	0/13	0/13	-		.0026 - .025	0.083
COPPER	mg/L	UNF	1/13	0/13	-	.0099 - .0099	.0026 - .025	0.0354
CYANIDE	mg/L	FIL	0/12	0/12	-		0 - .02	ND
CYANIDE	mg/L	UNF	0/13	0/13	-		0 - .02	ND
IRON	mg/L	FIL	12/13	6/13	3.39	.124 - 14.7	.116 - .116	4.14
IRON	mg/L	UNF	13/13	7/13	7.08	.152 - 78.9		5.72
LEAD	mg/L	FIL	0/13	0/13	-		.001 - .011	0.009
LEAD	mg/L	UNF	1/13	0/13	-	.0014 - .0014	.001 - .005	0.002
MAGNESIUM	mg/L	FIL	13/13	4/13	29.2	22.5 - 75.4		37.8
MAGNESIUM	mg/L	UNF	13/13	4/13	29.2	22.3 - 76.6		38.5
MANGANESE	mg/L	FIL	13/13	2/13	0.3	.094 - 1.65		0.78
MANGANESE	mg/L	UNF	13/13	2/13	0.38	.093 - 2.4		0.904
MERCURY	mg/L	FIL	0/13	0/13	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/13	0/13	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	2/13	0/13	-	.01 - .02	.01 - .025	0.025
MOLYBDENUM	mg/L	UNF	1/10	1/10	-	.0154 - .0154	.01 - .025	ND
NICKEL	mg/L	FIL	1/13	1/13	-	.0285 - .0285	.005 - .031	0.023
NICKEL	mg/L	UNF	0/13	0/13	-		.005 - .031	0.0514
OSMIUM		FIL	0/1	0/1	-		.05 - .05	NA
POTASSIUM	mg/L	FIL	12/13	4/13	2.78	1.25 - 19	.82 - .82	3.32
POTASSIUM	mg/L	UNF	13/13	11/13	2.71	.891 - 19		1.96
SELENIUM	mg/L	FIL	3/13	0/13	-	.0016 - .0016	.001 - .01	0.004
SELENIUM	mg/L	UNF	2/13	2/13	-	.0013 - .0026	.001 - .01	0.00075
SILICON	mg/L	FIL	3/3	3/3	-	6.62 - 8.7		3.46
SILICON	mg/L	UNF	2/2	1/2	-	4.07 - 8.83		5.81
SILVER	mg/L	FIL	1/13	0/13	-	.0039 - .0039	.001 - .007	0.0138
SILVER	mg/L	UNF	1/13	1/13	-	.071 - .071	.003 - .007	0.0117
SODIUM	mg/L	FIL	13/13	3/13	12.9	10.2 - 81.5		55
SODIUM	mg/L	UNF	13/13	5/13	13.7	10.2 - 83		47.1
THALLIUM	mg/L	FIL	0/13	0/13	-		.001 - .01	ND
THALLIUM	mg/L	UNF	0/13	0/13	-		.001 - .01	ND
TIN		FIL	0/1	0/1	-		.03 - .03	NA
TIN		UNF	0/1	0/1	-		.0556 - .0556	NA
VANADIUM	mg/L	FIL	0/13	0/13	-		.0029 - .05	0.0234
VANADIUM	mg/L	UNF	0/13	0/13	-		.0029 - .05	0.0117
ZINC	mg/L	FIL	5/13	0/13	-	.0023 - .023	.002 - .0378	0.0568
ZINC	mg/L	UNF	3/13	1/13	-	.0105 - .032	.0054 - .0378	0.021
1,1,1,2-TETRACHLOROETHANE		UNF	0/8	0/8	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/13	0/13	-		1 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/13	0/13	-		1 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/13	0/13	-		1 - 10	NA
1,1-DICHLOROETHANE		UNF	0/13	0/13	-		1 - 10	NA
1,1-DICHLOROETHENE		UNF	0/13	0/13	-		1 - 10	NA
1,2-DICHLOROETHANE		UNF	0/13	0/13	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/13	0/13	-		1 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/13	0/13	-		1 - 10	NA
2-BUTANONE		UNF	1/13	1/13	-	37 - 37	2 - 10	NA
2-HEXANONE		UNF	0/13	0/13	-		2 - 10	NA

000218

6161

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-METHYL-2-PENTANONE		UNF	0/13	0/13	-		2 - 10	NA
ACETONE		UNF	0/13	0/13	-		2 - 10	NA
BENZENE		UNF	0/13	0/13	-		1 - 10	NA
BROMODICHLOROMETHANE		UNF	0/13	0/13	-		1 - 10	NA
BROMOFORM		UNF	0/13	0/13	-		1 - 10	NA
BROMOMETHANE		UNF	0/13	0/13	-		1 - 10	NA
CARBON DISULFIDE		UNF	0/13	0/13	-		1 - 10	NA
CARBON TETRACHLORIDE		UNF	0/13	0/13	-		1 - 10	NA
CHLOROBENZENE		UNF	0/13	0/13	-		1 - 10	NA
CHLOROETHANE		UNF	0/13	0/13	-		1 - 10	NA
CHLOROFORM		UNF	0/13	0/13	-		1 - 10	NA
CHLOROMETHANE		UNF	0/13	0/13	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/13	0/13	-		1 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/13	0/13	-		1 - 10	NA
ETHYLBENZENE		UNF	0/13	0/13	-		1 - 10	NA
ISOBUTYL ALCOHOL		UNF	0/1	0/1	-		3000 - 3000	NA
METHYLENE CHLORIDE		UNF	0/13	0/13	-		1 - 10	NA
STYRENE		UNF	0/13	0/13	-		1 - 10	NA
TETRACHLOROETHENE		UNF	0/13	0/13	-		1 - 10	NA
TOLUENE		UNF	0/13	0/13	-		1 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/13	0/13	-		1 - 10	NA
TRICHLOROETHENE		UNF	0/13	0/13	-		1 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/8	0/8	-		1 - 1	NA
VINYL ACETATE		UNF	0/11	0/11	-		2 - 10	NA
VINYL CHLORIDE		UNF	0/13	0/13	-		1 - 10	NA
XYLENES, TOTAL		UNF	0/13	0/13	-		1 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/6	0/6	-		4 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/5	0/5	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/6	0/6	-		4 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/6	0/6	-		4 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/6	0/6	-		4 - 50	NA
2,4,6-TRICHLOROPHENOL		UNF	0/6	0/6	-		4 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/6	0/6	-		4 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/6	0/6	-		4 - 10	NA
2,4-DINITROPHENOL		UNF	0/6	0/6	-		4 - 50	NA
2,4-DINITROTOLUENE		UNF	0/6	0/6	-		10 - 15	NA
2,6-DINITROTOLUENE		UNF	0/6	0/6	-		10 - 15	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/11	0/11	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/6	0/6	-		4 - 10	NA
2-CHLOROPHENOL		UNF	0/6	0/6	-		4 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/5	0/5	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/6	0/6	-		4 - 10	NA
2-NITROANILINE		UNF	0/6	0/6	-		15 - 50	NA
2-NITROPHENOL		UNF	0/6	0/6	-		4 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/6	0/6	-		10 - 20	NA
3-NITROANILINE		UNF	0/6	0/6	-		15 - 50	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/6	0/6	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/6	0/6	-		10 - 15	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/6	0/6	-		4 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/6	0/6	-		10 - 15	NA
4-METHYLPHENOL		UNF	0/5	0/5	-		10 - 10	NA
4-NITROANILINE		UNF	0/6	0/6	-		15 - 50	NA
4-NITROPHENOL		UNF	0/6	0/6	-		4 - 50	NA

000219

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ACENAPHTHENE		UNF	0/5	0/5	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/6	0/6	-		4 - 10	NA
ANTHRACENE		UNF	0/6	0/6	-		4 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/6	0/6	-		4 - 10	NA
BENZO(A)PYRENE		UNF	0/6	0/6	-		4 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/6	0/6	-		4 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/6	0/6	-		4 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/6	0/6	-		4 - 10	NA
BENZOIC ACID		UNF	0/3	0/3	-		4 - 50	NA
BENZYL ALCOHOL		UNF	0/3	0/3	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/6	0/6	-		10 - 15	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/6	0/6	-		10 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/6	0/6	-		10 - 15	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	2/6	2/6	-	4 - 4	4 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	1/6	1/6	-	1 - 1	4 - 10	NA
CARBAZOLE		UNF	0/3	0/3	-		10 - 10	NA
CHRYSENE		UNF	0/6	0/6	-		4 - 10	NA
CUMENE		UNF	0/8	0/8	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	1/6	1/6	-	.8 - .8	4 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/5	0/5	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/6	0/6	-		4 - 10	NA
DIBENZOFURAN		UNF	0/6	0/6	-		4 - 10	NA
DIETHYL PHTHALATE		UNF	0/6	0/6	-		4 - 10	NA
DIMETHYL PHTHALATE		UNF	0/6	0/6	-		4 - 10	NA
FLUORANTHENE		UNF	0/6	0/6	-		4 - 10	NA
FLUORENE		UNF	0/6	0/6	-		4 - 10	NA
HEXACHLOROBENZENE		UNF	0/6	0/6	-		4 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/6	0/6	-		4 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/6	0/6	-		4 - 10	NA
HEXACHLOROETHANE		UNF	0/6	0/6	-		4 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/6	0/6	-		4 - 10	NA
ISOPHORONE		UNF	0/6	0/6	-		4 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/6	0/6	-		4 - 10	NA
N-NITROSODIMETHYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/6	0/6	-		4 - 10	NA
NAPHTHALENE		UNF	0/6	0/6	-		4 - 10	NA
NITROBENZENE		UNF	0/6	0/6	-		4 - 10	NA
O,O,O-TRIETHYLPHOSPHOROTHIOATE		UNF	0/1	0/1	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/5	0/5	-		4 - 10	NA
PENTACHLOROPHENOL		UNF	0/6	0/6	-		4 - 50	NA
PHENANTHRENE		UNF	0/6	0/6	-		4 - 10	NA
PHENOL		UNF	0/6	0/6	-		4 - 10	NA
PYRENE		UNF	0/6	0/6	-		4 - 10	NA
PYRIDINE		UNF	0/3	0/3	-		4 - 50000	NA
4,4'-DDD		UNF	0/5	0/5	-		.1 - .2	NA
4,4'-DDE		UNF	0/5	0/5	-		.1 - .2	NA
4,4'-DDT		UNF	0/5	0/5	-		.1 - .93	NA
ALDRIN		UNF	0/5	0/5	-		.05 - .2	NA
ALPHA-BHC		UNF	0/5	0/5	-		.05 - .2	NA
ALPHA-CHLORDANE		UNF	0/4	0/4	-		.05 - .5	NA
AROCLOR-1016		UNF	0/5	0/5	-		.2 - 1	NA
AROCLOR-1221		UNF	0/5	0/5	-		.2 - 2	NA
AROCLOR-1232		UNF	0/5	0/5	-		.2 - 2	NA

000220

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
AROCLOR-1242		UNF	0/5	0/5	-		.2 - 2	NA
AROCLOR-1248		UNF	0/5	0/5	-		.2 - 2	NA
AROCLOR-1254		UNF	0/5	0/5	-		.2 - 2	NA
AROCLOR-1260		UNF	0/5	0/5	-		.2 - 2	NA
BETA-BHC		UNF	0/5	0/5	-		.05 - .2	NA
CHLORDANE		UNF	0/3	0/3	-		.2 - .2	NA
DELTA-BHC		UNF	0/5	0/5	-		.05 - .2	NA
DIELDRIN		UNF	0/5	0/5	-		.1 - .2	NA
ENDOSULFAN II		UNF	0/5	0/5	-		.1 - .2	NA
ENDOSULFAN SULFATE		UNF	0/5	0/5	-		.1 - .2	NA
ENDOSULFAN-I		UNF	0/5	0/5	-		.05 - .2	NA
ENDRIN		UNF	0/6	0/6	-		.08 - 200	NA
ENDRIN ALDEHYDE		UNF	0/5	0/5	-		.1 - .2	NA
ENDRIN KETONE		UNF	0/4	0/4	-		.1 - .1	NA
GAMMA-BHC (LINDANE)		UNF	0/6	0/6	-		.05 - 200	NA
GAMMA-CHLORDANE		UNF	0/4	0/4	-		.05 - 1.5	NA
HEPTACHLOR		UNF	0/5	0/5	-		.05 - .2	NA
HEPTACHLOR EPOXIDE		UNF	0/5	0/5	-		.05 - .2	NA
METHOXYCHLOR		UNF	0/6	0/6	-		.5 - 200	NA
TOXAPHENE		UNF	0/6	0/6	-		.5 - 500	NA
2,4,5-T		UNF	0/2	0/2	-		.25 - 5	NA
2,4,5-TP (SILVEX)		UNF	0/4	0/4	-		.025 - 500	NA
2,4-D		UNF	0/4	0/4	-		.05 - 1000	NA
2,4-DB		UNF	0/1	0/1	-		.25 - .25	NA
AZINPHOSMETHYL		UNF	0/3	0/3	-		.2 - 5	NA
DEMETON		UNF	0/3	0/3	-		.2 - 1	NA
DIAZINON		UNF	0/3	0/3	-		.1 - .5	NA
DISULFOTON		UNF	0/3	0/3	-		.1 - .5	NA
ETHION		UNF	0/3	0/3	-		.1 - .5	NA
MALATHION		UNF	0/3	0/3	-		.1 - 1	NA
METHYL PARATHION		UNF	0/3	0/3	-		.1 - 1	NA
PARATHION		UNF	0/3	0/3	-		.1 - .5	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN		UNF	0/2	0/2	-		.62 - .7	NA
1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN		UNF	0/2	0/2	-		1.1 - 1.5	NA
1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.82 - 1.4	NA
1,2,3,4,7,8-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/2	0/2	-		1.2 - 1.4	NA
1,2,3,4,7,8-HEXACHLORODIBENZOFURAN		UNF	0/3	0/3	-		.19 - .82	NA
1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/3	0/3	-		.34 - 1.3	NA
1,2,3,6,7,8-HEXACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.4 - .75	NA
1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN		UNF	0/2	0/2	-		1.1 - 1.2	NA
1,2,3,7,8,9-HEXACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.96 - 2.6	NA
1,2,3,7,8-PENTACHLORODIBENZO-P-DIOXIN		UNF	0/2	0/2	-		1.2 - 5.3	NA
1,2,3,7,8-PENTACHLORODIBENZOFURAN		UNF	0/3	0/3	-		.13 - 2.1	NA
1,4-DIOXANE		UNF	0/1	0/1	-		1000 - 1000	NA
2,3,4,6,7,8-HEXACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.43 - .8	NA
2,3,4,7,8-PENTACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.56 - 2	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN		UNF	0/3	0/3	-		.31 - 1.2	NA
2,3,7,8-TETRACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.52 - 1.3	NA
HEPTACHLORODIBENZO-P-DIOXINS		UNF	0/2	0/2	-		.62 - .7	NA
HEPTACHLORODIBENZOFURANS		UNF	0/2	0/2	-		1.2 - 1.6	NA
HEXACHLORODIBENZO-P-DIOXINS		UNF	0/3	0/3	-		.34 - 1.3	NA
HEXACHLORODIBENZOFURANS		UNF	0/3	0/3	-		.47 - 2.7	NA
OCTACHLORODIBENZO-P-DIOXIN		UNF	0/2	0/2	-		.84 - 1.4	NA

000221

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
OCTACHLORODIBENZOFURAN		UNF	0/2	0/2	-		.55 - 1.1	NA
PENTACHLORODIBENZO-P-DIOXINS		UNF	0/3	0/3	-		1.2 - 5.3	NA
PENTACHLORODIBENZOFURANS		UNF	1/3	1/3	-	.43 - .43	1.1 - 1.2	NA
TETRACHLORODIBENZO-P-DIOXINS		UNF	1/3	1/3	-	3.8 - 3.8	.54 - 2.5	NA
TETRACHLORODIBENZOFURANS		UNF	1/3	1/3	-	1.1 - 1.1	.76 - 1.6	NA
ALKALINITY AS CACO3		UNF	13/13	13/13	316	218 - 548		NA
ALLYL CHLORIDE		UNF	0/8	0/8	-		5 - 5	NA
AMMONIA	mg/L	UNF	11/13	1/13	0.35	.12 - 7.9	.02 - .28	4.2
BICARBONATE ALKALINITY		UNF	11/11	11/11	366	250 - 671		NA
CARBONATE ALKALINITY		UNF	0/11	0/11	-		1 - 30	NA
CHEMICAL OXYGEN DEMAND		UNF	1/2	1/2	11	17 - 17	10 - 10	NA
CHLORIDE	mg/L	UNF	13/13	3/13	26	21 - 210		73
FLUORIDE	mg/L	FIL	1/1	1/1	-	.2 - .2		not tested
FLUORIDE	mg/L	UNF	10/13	0/13	0.16	.08 - .43	.1 - .15	0.89
HEXAVALENT CHROMIUM		UNF	0/2	0/2	-		.005 - .005	NA
NITRATE	mg/L	UNF	6/12	0/12	0.05	.02 - 1.22	.02 - .12	11.4
NITRATE, AS NITROGEN		UNF	5/9	5/9	0.06	.06 - 21.8	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	2/13	0/13	-	.02 - .04	.02 - .05	4.1
NITRITE, AS NITROGEN		UNF	2/8	2/8	-	.04 - .08	.02 - .02	NA
PH		UNF	12/12	12/12	7.3	7.1 - 7.71		NA
PHENOLS	mg/L	UNF	1/13	0/13	-	.002 - .002	.002 - .15	0.03
PHOSPHATE		UNF	4/4	4/4	0.46	.03 - .88		NA
PHOSPHORUS		UNF	7/13	7/13	0.05	.045 - .89	.03 - .1	NA
SPECIFIC CONDUCTIVITY		UNF	12/12	12/12	792	476 - 2000		NA
SULFATE	mg/L	UNF	13/13	7/13	218	22 - 520		197
SULFIDE		UNF	0/5	0/5	-		.5 - 1000	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	9/9	2/9	680	134 - 1030		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	10/11	2/11	0.72	.1 - 27	.3 - .3	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	13/13	8/13	4	1 - 36		2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	3/13	2/13	-	.048 - .15	.01 - .11	0.052
TOTAL ORGANIC HALOGENS		UNF	2/10	2/10	-	.014 - .015	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	6/12	0/12	0.08	.1 - .3	-2 - .1	0.9
TOTAL SOLIDS		UNF	11/11	11/11	773	340 - 1300		NA
1,2,3-TRICHLOROPROPANE		UNF	0/8	0/8	-		5 - 5	NA
1,2,4,5-TETRACHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/8	0/8	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/8	0/8	-		2 - 2	NA
1,3,5-TRINITROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,3-DINITROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,4-NAPHTHOQUINONE		UNF	0/1	0/1	-		10 - 10	NA
1-NAPHTHYLAMINE		UNF	0/1	0/1	-		120 - 120	NA
2,3,4,6-TETRACHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,6-DICHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2-ACETYLAMINOFLUORENE		UNF	0/1	0/1	-		10 - 10	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/8	0/8	-		5 - 5	NA
2-NAPHTHYLAMINE		UNF	0/1	0/1	-		170 - 170	NA
2-PICOLINE		UNF	0/1	0/1	-		70 - 70	NA
3,3'-DIMETHYLBENZIDINE		UNF	0/1	0/1	-		80 - 80	NA
3-CHLOROPROPENE		UNF	0/1	0/1	-		5 - 5	NA
3-METHYLCHOLANTHRENE		UNF	0/1	0/1	-		30 - 30	NA
3-METHYLPHENOL		UNF	0/3	0/3	-		4 - 10	NA
4-AMINOBIPHENYL		UNF	0/1	0/1	-		50 - 50	NA
4-CHLOROANILINE		UNF	0/1	0/1	-		10 - 10	NA

000222
6161

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-NITROQUINOLINE-1-OXIDE		UNF	0/1	0/1	-		10 - 10	NA
5-NITRO-O-TOLUIDINE		UNF	0/1	0/1	-		20 - 20	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE		UNF	0/1	0/1	-		20 - 20	NA
A,A-DIMETHYLPHENETHYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
ACETONITRILE		UNF	0/1	0/1	-		200 - 200	NA
ACETOPHENONE		UNF	0/1	0/1	-		10 - 10	NA
ACROLEIN		UNF	0/8	0/8	-		50 - 50	NA
ACROLEIN		UNF	0/8	0/8	-		50 - 50	NA
ACRYLONITRILE		UNF	0/8	0/8	-		50 - 50	NA
ALACHLOR		UNF	0/2	0/2	-		2000 - 2000	NA
ANILINE		UNF	0/1	0/1	-		10 - 10	NA
ARAMITE		UNF	0/1	0/1	-		10 - 10	NA
ATRAZINE		UNF	0/2	0/2	-		1000 - 2000	NA
CARBOFURAN		UNF	0/2	0/2	-		1000000 - 1000000	NA
CYANAZINE		UNF	0/2	0/2	-		1000 - 1000	NA
DALAPON		UNF	0/1	0/1	-		2.5 - 2.5	NA
DIALLATE		UNF	0/1	0/1	-		10 - 10	NA
DIBROMOMETHANE		UNF	0/1	0/1	-		10 - 10	NA
DICAMBA		UNF	0/1	0/1	-		.25 - .25	NA
DICHLORODIFLUOROMETHANE		UNF	0/8	0/8	-		10 - 10	NA
DICHLOROPROP		UNF	0/1	0/1	-		.5 - .5	NA
DINOSEB		UNF	0/2	0/2	-		.5 - 20	NA
DIPHENYLAMINE		UNF	0/3	0/3	-		10 - 15	NA
ETHYL CYANIDE		UNF	0/8	0/8	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/8	0/8	-		5 - 5	NA
ETHYL METHANESULFONATE		UNF	0/1	0/1	-		10 - 10	NA
FONOFOS		UNF	0/2	0/2	-		1000 - 1000	NA
HEXACHLOROPHENE		UNF	0/1	0/1	-		500 - 500	NA
HEXACHLOROPROPENE		UNF	0/1	0/1	-		20 - 20	NA
IODOMETHANE		UNF	0/8	0/8	-		5 - 5	NA
ISODRIN		UNF	0/1	0/1	-		.05 - .05	NA
ISOSAFROLE		UNF	0/1	0/1	-		10 - 10	NA
KEPONE		UNF	0/1	0/1	-		.1 - .1	NA
LINURON		UNF	0/2	0/2	-		1000 - 1000	NA
MCPA		UNF	0/1	0/1	-		250 - 250	NA
MCPP		UNF	0/1	0/1	-		250 - 250	NA
METHACRYLONITRILE		UNF	0/8	0/8	-		5 - 5	NA
METHAPYRILENE		UNF	0/1	0/1	-		40 - 40	NA
METHYL METHACRYLATE		UNF	0/8	0/8	-		5 - 5	NA
METHYL METHANESULFONATE		UNF	0/1	0/1	-		10 - 10	NA
METOLACHLOR		UNF	0/2	0/2	-		1000 - 1000	NA
METRIBUZIN		UNF	0/2	0/2	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE		UNF	0/1	0/1	-		20 - 20	NA
N-NITROSODIETHYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSOMETHYLETHYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSOMORPHOLINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSOPIPERIDINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSOPYRROLIDINE		UNF	0/1	0/1	-		10 - 10	NA
O-TOLUIDINE		UNF	0/1	0/1	-		10 - 10	NA
P-DIMETHYLAMINOAZOBENZENE		UNF	0/1	0/1	-		30 - 30	NA
P-PHENYLENEDIAMINE		UNF	0/1	0/1	-		50 - 50	NA
PENTACHLOROBENZENE		UNF	0/1	0/1	-		20 - 20	NA
PENTACHLOROETHANE		UNF	0/8	0/8	-		5 - 5	NA

000223

TABLE E.2-5
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
PENTACHLORONITROBENZENE		UNF	0/1	0/1	-		20 - 20	NA
PHENACETIN		UNF	0/1	0/1	-		10 - 10	NA
PRONAMIDE		UNF	0/1	0/1	-		30 - 30	NA
SAFROLE		UNF	0/1	0/1	-		10 - 10	NA
TETRAETHYLPYROPHOSPHATE		UNF	0/2	0/2	-		.1 - .2	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/10	0/10	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/8	0/8	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000224

6161

TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/5	1/5	0.3	.4 - .9	.3 - .3	0.9
URANIUM-238	pCi/L	UNF	2/5	1/5	-	.6 - .7	.2 - .6	0.64
URANIUM, TOTAL	ug/L	FIL	3/5	1/5	0.2	.4 - 30.3	.1 - .1	0.8
URANIUM, TOTAL	ug/L	UNF	3/5	1/5	0.2	.3 - 1.5	.1 - .1	1.2
URANIUM-234	pCi/L	FIL	1/5	0/5	-	.4 - .4	.3 - .6	0.9
URANIUM-234	pCi/L	UNF	3/5	0/5	0.45	.6 - .7	.2 - .6	0.8
THORIUM-230	pCi/L	FIL	2/5	2/5	-	.3 - .6	.2 - .3	0.29
THORIUM-230	pCi/L	UNF	1/5	0/5	-	.4 - .4	.2 - .3	0.89
RADIUM-226	pCi/L	FIL	1/5	1/5	-	3.9 - 3.9	1 - 1	1.9
RADIUM-226	pCi/L	UNF	0/5	0/5	-		1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/5	0/5	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	0/5	0/5	-		.2 - .2	0.094
THORIUM-232	pCi/L	FIL	1/5	1/5	-	.4 - .4	.2 - .3	0.3
THORIUM-232	pCi/L	UNF	0/5	0/5	-		.2 - .4	0.23
THORIUM, TOTAL	ug/L	FIL	1/1	1/1	-	8.208 - 8.208		2.8
THORIUM, TOTAL	ug/L	UNF	3/4	1/4	0.9	.9 - 1.2	1.7 - 1.7	0.97
RADIUM-228	pCi/L	FIL	0/5	0/5	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/5	0/5	-		3 - 3.4	3.6
THORIUM-228	pCi/L	FIL	0/5	0/5	-		.2 - .3	0.4
THORIUM-228	pCi/L	UNF	0/5	0/5	-		.2 - .3	0.77
NEPTUNIUM-237	pCi/L	UNF	0/4	0/4	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/5	0/5	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/5	0/5	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	1/1	1/1	-	2.5 - 2.5		ND
STRONTIUM-90	pCi/L	UNF	1/5	1/5	-	1.7 - 1.7	5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/1	0/1	-		15 - 15	ND
TECHNETIUM-99	pCi/L	UNF	0/5	0/5	-		15 - 30	ND
RUTHENIUM-106	pCi/L	UNF	0/4	0/4	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/1	0/1	-		5.4 - 5.4	ND
CESIUM-137	pCi/L	UNF	0/5	0/5	-		6.2 - 9.2	ND
GROSS ALPHA		FIL	1/5	1/5	-	16.2 - 16.2	3.2 - 4.6	NA
GROSS ALPHA		UNF	3/5	3/5	1.85	.9 - 12.7	2.5 - 3.3	NA
GROSS BETA		FIL	3/5	3/5	1.45	5.2 - 20	3.3 - 3.5	NA
GROSS BETA		UNF	4/5	4/5	2.65	1.1 - 5.9	11.1 - 11.1	NA
ALUMINUM	mg/L	FIL	1/5	1/5	-	.206 - .206	.014 - .036	0.175
ALUMINUM	mg/L	UNF	1/5	1/5	-	2.06 - 2.06	.014 - .097	0.225
ANTIMONY	mg/L	FIL	1/5	1/5	-	.0662 - .0662	.031 - .045	ND
ANTIMONY	mg/L	UNF	1/5	1/5	-	.0792 - .0792	.031 - .045	ND
ARSENIC	mg/L	FIL	1/5	0/5	-	.0014 - .0014	.001 - .002	0.26
ARSENIC	mg/L	UNF	2/5	0/5	-	.0019 - .0049	.001 - .002	0.0294
BARIUM	mg/L	FIL	5/5	0/5	0.407	.101 - .449		0.669
BARIUM	mg/L	UNF	5/5	0/5	0.327	.112 - .474		0.768
BERYLLIUM	mg/L	FIL	0/5	0/5	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/5	0/5	-		.001 - .001	ND
CADMIUM	mg/L	FIL	0/5	0/5	-		.002 - .003	0.006
CADMIUM	mg/L	UNF	1/5	0/5	-	.0034 - .0034	.002 - .003	0.0135
CALCIUM	mg/L	FIL	5/5	3/5	139	99.7 - 227		136
CALCIUM	mg/L	UNF	5/5	1/5	194	102 - 248		159
CHROMIUM	mg/L	FIL	0/5	0/5	-		.003 - .019	0.03
CHROMIUM	mg/L	UNF	1/5	1/5	-	.142 - .142	.003 - .0051	0.0211
COBALT	mg/L	FIL	1/5	1/5	-	.0089 - .0089	.006 - .0085	ND
COBALT	mg/L	UNF	1/5	1/5	-	.0129 - .0129	.006 - .008	0.0086
COPPER	mg/L	FIL	1/5	0/5	-	.03 - .03	.003 - .004	0.083

000225

TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
COPPER	mg/L	UNF	1/5	0/5	-	.03 - .03	.004 - .0068	0.0354
CYANIDE	mg/L	FIL	0/5	0/5	-		0 - .02	ND
CYANIDE	mg/L	UNF	0/5	0/5	-		.005 - .02	ND
IRON	mg/L	FIL	5/5	3/5	5.39	2.99 - 15.9		4.14
IRON	mg/L	UNF	5/5	3/5	5.28	3.16 - 16.9		5.72
LEAD	mg/L	FIL	1/5	1/5	-	.0132 - .0132	.001 - .0018	0.009
LEAD	mg/L	UNF	1/5	1/5	-	.0133 - .0133	.001 - .001	0.002
MAGNESIUM	mg/L	FIL	5/5	3/5	35.7	32.2 - 81.5		37.8
MAGNESIUM	mg/L	UNF	5/5	2/5	36.3	34.1 - 88.9		38.5
MANGANESE	mg/L	FIL	5/5	0/5	0.288	.0604 - .548		0.78
MANGANESE	mg/L	UNF	5/5	0/5	0.233	.0622 - .519		0.904
MERCURY	mg/L	FIL	0/5	0/5	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/5	0/5	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/4	0/4	-		.01 - .015	0.025
MOLYBDENUM	mg/L	UNF	0/4	0/4	-		.01 - .015	ND
NICKEL	mg/L	FIL	0/5	0/5	-		.019 - .0351	0.023
NICKEL	mg/L	UNF	1/5	1/5	-	.117 - .117	.019 - .031	0.0514
POTASSIUM	mg/L	FIL	4/5	0/5	1.13	1.04 - 2.54	2.06 - 2.06	3.32
POTASSIUM	mg/L	UNF	4/5	3/5	1.22	.483 - 2.92	.82 - .82	1.96
SELENIUM	mg/L	FIL	1/5	0/5	-	.0011 - .0011	.001 - .002	0.004
SELENIUM	mg/L	UNF	0/5	0/5	-		.001 - .0026	0.00075
SILICON	mg/L	FIL	2/2	2/2	3.1	6.25 - 6.43		3.46
SILVER	mg/L	FIL	0/5	0/5	-		.003 - .007	0.0138
SILVER	mg/L	UNF	0/5	0/5	-		.003 - .007	0.0117
SODIUM	mg/L	FIL	5/5	1/5	29.1	18.4 - 77.8		55
SODIUM	mg/L	UNF	5/5	1/5	29.9	19 - 84.2		47.1
THALLIUM	mg/L	FIL	0/5	0/5	-		.001 - .01	ND
THALLIUM	mg/L	UNF	0/5	0/5	-		.001 - .01	ND
TIN		FIL	0/1	0/1	-		1 - 1	NA
TIN		UNF	0/1	0/1	-		1 - 1	NA
VANADIUM	mg/L	FIL	0/5	0/5	-		.003 - .007	0.0234
VANADIUM	mg/L	UNF	1/5	0/5	-	.0051 - .0051	.003 - .007	0.0117
ZINC	mg/L	FIL	1/5	1/5	-	.0766 - .0766	.0046 - .0156	0.0568
ZINC	mg/L	UNF	0/5	0/5	-		.006 - .0511	0.021
1,1,1,2-TETRACHLOROETHANE		UNF	0/3	0/3	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1-DICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,1-DICHLOROETHENE		UNF	0/5	0/5	-		10 - 10	NA
1,2-DICHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/5	0/5	-		10 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/5	0/5	-		10 - 10	NA
2-BUTANONE		UNF	0/5	0/5	-		10 - 10	NA
2-HEXANONE		UNF	0/5	0/5	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/5	0/5	-		10 - 10	NA
ACETONE		UNF	0/5	0/5	-		10 - 10	NA
BENZENE		UNF	0/5	0/5	-		10 - 10	NA
BROMODICHLOROMETHANE		UNF	0/5	0/5	-		10 - 10	NA
BROMOFORM		UNF	0/5	0/5	-		10 - 10	NA
BROMOMETHANE		UNF	0/5	0/5	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/5	0/5	-		10 - 10	NA
CARBON TETRACHLORIDE		UNF	0/5	0/5	-		10 - 10	NA

TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHLOROBENZENE		UNF	0/5	0/5	-		10 - 10	NA
CHLOROETHANE		UNF	0/5	0/5	-		10 - 10	NA
CHLOROFORM		UNF	0/5	0/5	-		10 - 10	NA
CHLOROMETHANE		UNF	0/5	0/5	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/5	0/5	-		10 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/5	0/5	-		10 - 10	NA
ETHYLBENZENE		UNF	0/5	0/5	-		10 - 10	NA
ISOBUTYL ALCOHOL		UNF	0/1	0/1	-		3000 - 3000	NA
METHYLENE CHLORIDE		UNF	0/5	0/5	-		10 - 10	NA
STYRENE		UNF	0/5	0/5	-		10 - 10	NA
T-1,4-DICHLORO-2-BUTENE		UNF	0/1	0/1	-		20 - 20	NA
TETRACHLOROETHENE		UNF	0/5	0/5	-		10 - 10	NA
TOLUENE		UNF	1/5	1/5	-	2 - 2	10 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/5	0/5	-		10 - 10	NA
TRICHLOROETHENE		UNF	0/5	0/5	-		10 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/3	0/3	-		1 - 1	NA
VINYL ACETATE		UNF	0/4	0/4	-		10 - 10	NA
VINYL CHLORIDE		UNF	0/5	0/5	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/5	0/5	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/4	0/4	-		4 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/4	0/4	-		4 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/4	0/4	-		4 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/4	0/4	-		4 - 50	NA
2,4,6-TRICHLOROPHENOL		UNF	0/4	0/4	-		4 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/4	0/4	-		4 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/4	0/4	-		4 - 10	NA
2,4-DINITROPHENOL		UNF	0/4	0/4	-		4 - 50	NA
2,4-DINITROTOLUENE		UNF	0/4	0/4	-		10 - 15	NA
2,6-DINITROTOLUENE		UNF	0/4	0/4	-		10 - 15	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/4	0/4	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/4	0/4	-		4 - 10	NA
2-CHLOROPHENOL		UNF	0/4	0/4	-		4 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/3	0/3	-		4 - 10	NA
2-METHYLPHENOL		UNF	0/4	0/4	-		4 - 10	NA
2-NITROANILINE		UNF	0/4	0/4	-		15 - 50	NA
2-NITROPHENOL		UNF	0/4	0/4	-		4 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/4	0/4	-		10 - 20	NA
3-NITROANILINE		UNF	0/4	0/4	-		15 - 50	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/4	0/4	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/4	0/4	-		10 - 15	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/4	0/4	-		4 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/4	0/4	-		10 - 15	NA
4-METHYLPHENOL		UNF	0/2	0/2	-		10 - 10	NA
4-NITROANILINE		UNF	0/4	0/4	-		15 - 50	NA
4-NITROPHENOL		UNF	0/4	0/4	-		4 - 50	NA
ACENAPHTHENE		UNF	0/3	0/3	-		4 - 10	NA
ACENAPHTHYLENE		UNF	0/4	0/4	-		4 - 10	NA
ANTHRACENE		UNF	0/4	0/4	-		4 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/4	0/4	-		4 - 10	NA
BENZO(A)PYRENE		UNF	0/4	0/4	-		4 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/4	0/4	-		4 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/4	0/4	-		4 - 10	NA

TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(K)FLUORANTHENE		UNF	0/4	0/4	-		4 - 10	NA
BENZOIC ACID		UNF	0/3	0/3	-		4 - 50	NA
BENZYL ALCOHOL		UNF	0/3	0/3	-		10 - 40	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/4	0/4	-		10 - 15	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/4	0/4	-		10 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/4	0/4	-		4 - 15	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	2/4	2/4	3.5	5 - 12	4 - 4	NA
BUTYL BENZYL PHTHALATE		UNF	0/4	0/4	-		4 - 10	NA
CARBAZOLE		UNF	0/1	0/1	-		10 - 10	NA
CHRYSENE		UNF	0/4	0/4	-		4 - 10	NA
CUMENE		UNF	0/3	0/3	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	0/4	0/4	-		4 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/3	0/3	-		4 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/4	0/4	-		4 - 10	NA
DIBENZOFURAN		UNF	0/4	0/4	-		4 - 10	NA
DIETHYL PHTHALATE		UNF	0/4	0/4	-		4 - 10	NA
DIMETHYL PHTHALATE		UNF	0/4	0/4	-		4 - 10	NA
FLUORANTHENE		UNF	0/4	0/4	-		4 - 10	NA
FLUORENE		UNF	0/4	0/4	-		4 - 10	NA
HEXACHLOROBENZENE		UNF	0/4	0/4	-		4 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/4	0/4	-		4 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/4	0/4	-		4 - 10	NA
HEXACHLOROETHANE		UNF	0/4	0/4	-		4 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/4	0/4	-		4 - 10	NA
ISOPHORONE		UNF	0/4	0/4	-		4 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/4	0/4	-		4 - 10	NA
N-NITROSODIMETHYLAMINE		UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIPHENYLAMINE		UNF	0/4	0/4	-		4 - 10	NA
NAPHTHALENE		UNF	0/4	0/4	-		4 - 10	NA
NITROBENZENE		UNF	0/4	0/4	-		4 - 10	NA
P-CHLOROANILINE		UNF	0/4	0/4	-		4 - 10	NA
PENTACHLOROPHENOL		UNF	0/4	0/4	-		4 - 50	NA
PHENANTHRENE		UNF	0/4	0/4	-		4 - 10	NA
PHENOL		UNF	0/4	0/4	-		4 - 10	NA
PYRENE		UNF	0/4	0/4	-		4 - 10	NA
PYRIDINE		UNF	0/3	0/3	-		4 - 4	NA
4,4'-DDD		UNF	0/3	0/3	-		.2 - 4	NA
4,4'-DDE		UNF	0/3	0/3	-		.2 - 4	NA
4,4'-DDT		UNF	0/3	0/3	-		.2 - 4	NA
ALDRIN		UNF	0/3	0/3	-		.2 - .2	NA
ALPHA-BHC		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1016		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1221		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1232		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1242		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1248		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1254		UNF	0/3	0/3	-		.2 - .2	NA
AROCLOR-1260		UNF	0/3	0/3	-		.2 - .2	NA
BETA-BHC		UNF	0/3	0/3	-		.2 - .2	NA
CHLORDANE		UNF	0/3	0/3	-		.2 - .2	NA
CHLOROBENZILATE		UNF	0/1	0/1	-		15 - 15	NA
DELTA-BHC		UNF	0/3	0/3	-		.2 - .2	NA
DIELDRIN		UNF	0/3	0/3	-		.2 - .2	NA

TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ENDOSULFAN II		UNF	0/3	0/3	-		.2 - .2	NA
ENDOSULFAN SULFATE		UNF	0/3	0/3	-		.2 - .2	NA
ENDOSULFAN-I		UNF	0/3	0/3	-		.2 - .2	NA
ENDRIN		UNF	0/3	0/3	-		.08 - .2	NA
ENDRIN ALDEHYDE		UNF	0/3	0/3	-		.2 - .2	NA
GAMMA-BHC (LINDANE)		UNF	0/3	0/3	-		.2 - .2	NA
HEPTACHLOR		UNF	0/3	0/3	-		.2 - .2	NA
HEPTACHLOR EPOXIDE		UNF	0/3	0/3	-		.2 - .2	NA
METHOXYCHLOR		UNF	0/2	0/2	-		.2 - 200	NA
SULFOTEP		UNF	0/1	0/1	-		15 - 15	NA
TOXAPHENE		UNF	0/3	0/3	-		.5 - .5	NA
2,4,5-T		UNF	0/1	0/1	-		.5 - .5	NA
2,4,5-TP (SILVEX)		UNF	0/2	0/2	-		.5 - 500	NA
2,4-D		UNF	0/2	0/2	-		1 - 1000	NA
DIMETHOATE		UNF	0/1	0/1	-		15 - 15	NA
DISULFOTON		UNF	0/1	0/1	-		15 - 15	NA
FAMPHUR		UNF	0/1	0/1	-		15 - 15	NA
METHYL PARATHION		UNF	0/1	0/1	-		15 - 15	NA
PARATHION		UNF	0/1	0/1	-		15 - 15	NA
PHORATE		UNF	0/1	0/1	-		15 - 15	NA
THIONAZIN		UNF	0/1	0/1	-		15 - 15	NA
1,4-DIOXANE		UNF	0/1	0/1	-		5000 - 5000	NA
ALKALINITY AS CACO3		UNF	5/5	5/5	355	330 - 500		NA
ALLYL CHLORIDE		UNF	0/3	0/3	-		5 - 5	NA
AMMONIA	mg/L	UNF	5/5	0/5	1.6	1 - 2.62		4.2
BICARBONATE ALKALINITY		UNF	4/4	4/4	410	360 - 650		NA
CARBONATE ALKALINITY		UNF	0/4	0/4	-		3 - 30	NA
CHEMICAL OXYGEN DEMAND		UNF	0/1	0/1	-		10 - 10	NA
CHLORIDE	mg/L	UNF	5/5	1/5	32	29 - 218		73
FLUORIDE	mg/L	UNF	4/5	0/5	0.49	.38 - .6	.15 - .15	0.89
HEXAVALENT CHROMIUM		UNF	0/1	0/1	-		.005 - .005	NA
NITRATE	mg/L	UNF	0/4	0/4	-		.02 - .1	11.4
NITRATE, AS NITROGEN		UNF	2/4	2/4	0.02	.02 - .17	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	1/5	0/5	-	.03 - .03	.02 - .05	4.1
NITRITE, AS NITROGEN		UNF	0/3	0/3	-		.02 - .02	NA
PH		UNF	4/4	4/4	7.5	7.49 - 7.6		NA
PHENOLS	mg/L	UNF	0/5	0/5	-		.002 - .15	0.03
PHOSPHORUS		UNF	5/5	5/5	0.27	.16 - .45		NA
SPECIFIC CONDUCTIVITY		UNF	4/4	4/4	830	800 - 1980		NA
SULFATE	mg/L	UNF	5/5	1/5	92	65 - 483		197
SULFIDE		UNF	1/3	1/3	-	25.8 - 25.8	.2 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	4/4	1/4	380	164 - 1200		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	3/4	1/4	1.35	.4 - 4.63	2.7 - 2.7	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	5/5	3/5	2.8	2 - 16		2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	2/5	1/5	-	.022 - .067	.01 - .045	0.052
TOTAL ORGANIC HALOGENS		UNF	2/4	2/4	0.013	.013 - .028	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	2/5	1/5	-	.395 - 2.01	-.064 - .5	0.9
TOTAL SOLIDS		UNF	4/4	4/4	580	480 - 1470		NA
1,2,3-TRICHLOROPROPANE		UNF	0/3	0/3	-		5 - 5	NA
1,2,4,5-TETRACHLOROBENZENE		UNF	0/1	0/1	-		4 - 4	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/3	0/3	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/3	0/3	-		2 - 2	NA
1,3,5-TRINITROBENZENE		UNF	0/1	0/1	-		15 - 15	NA

000229

TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
1,3-DINITROBENZENE		UNF	0/1	0/1	-		15 - 15	NA
1,4-NAPHTHOQUINONE		UNF	0/1	0/1	-		15 - 15	NA
1-NAPHTHYLAMINE		UNF	0/1	0/1	-		15 - 15	NA
2,3,4,6-TETRACHLOROPHENOL		UNF	0/1	0/1	-		4 - 4	NA
2,6-DICHLOROPHENOL		UNF	0/1	0/1	-		4 - 4	NA
2-ACETYLAMINOFLUORENE		UNF	0/1	0/1	-		15 - 15	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/3	0/3	-		5 - 5	NA
2-NAPHTHYLAMINE		UNF	0/1	0/1	-		4 - 4	NA
2-PICOLINE		UNF	0/1	0/1	-		15 - 15	NA
3,3'-DIMETHYLBENZIDINE		UNF	0/1	0/1	-		15 - 15	NA
3-METHYLCHOLANTHRENE		UNF	0/1	0/1	-		15 - 15	NA
3-METHYLPHENOL		UNF	0/3	0/3	-		4 - 4	NA
4-AMINOBIPHENYL		UNF	0/1	0/1	-		15 - 15	NA
4-NITROQUINOLINE-1-OXIDE		UNF	0/1	0/1	-		15 - 15	NA
5-NITRO-O-TOLUIDINE		UNF	0/1	0/1	-		15 - 15	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE		UNF	0/1	0/1	-		15 - 15	NA
A,A-DIMETHYLPHENETHYLAMINE		UNF	0/1	0/1	-		15 - 15	NA
ACETONITRILE		UNF	0/1	0/1	-		1000 - 1000	NA
ACETOPHENONE		UNF	0/1	0/1	-		15 - 15	NA
ACROLEIN		UNF	0/3	0/3	-		50 - 50	NA
ACROLEIN		UNF	0/3	0/3	-		50 - 50	NA
ACRYLONITRILE		UNF	0/4	0/4	-		50 - 50	NA
ALACHLOR		UNF	0/1	0/1	-		2000 - 2000	NA
ANILINE		UNF	0/1	0/1	-		4 - 4	NA
ARAMITE		UNF	0/1	0/1	-		15 - 15	NA
ATRAZINE		UNF	0/1	0/1	-		1000 - 1000	NA
CARBOFURAN		UNF	0/1	0/1	-		1000000 - 1000000	NA
CYANAZINE		UNF	0/1	0/1	-		1000 - 1000	NA
DIALLATE		UNF	0/1	0/1	-		15 - 15	NA
DIBROMOMETHANE		UNF	0/1	0/1	-		1 - 1	NA
DICHLORODIFLUOROMETHANE		UNF	0/3	0/3	-		10 - 10	NA
DINOSEB		UNF	0/1	0/1	-		.5 - .5	NA
DIPHENYLAMINE		UNF	0/3	0/3	-		15 - 15	NA
ETHYL CYANIDE		UNF	0/3	0/3	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/3	0/3	-		5 - 5	NA
ETHYL METHANESULFONATE		UNF	0/1	0/1	-		15 - 15	NA
FONOFOS		UNF	0/1	0/1	-		1000 - 1000	NA
HEXACHLOROPHENE		UNF	0/1	0/1	-		4 - 4	NA
HEXACHLOROPROPENE		UNF	0/1	0/1	-		4 - 4	NA
IODOMETHANE		UNF	0/3	0/3	-		5 - 5	NA
ISODRIN		UNF	0/1	0/1	-		4 - 4	NA
ISOSAFROLE		UNF	0/1	0/1	-		15 - 15	NA
KEPONE		UNF	0/1	0/1	-		4 - 4	NA
LINURON		UNF	0/1	0/1	-		1000 - 1000	NA
METHACRYLONITRILE		UNF	0/3	0/3	-		5 - 5	NA
METHAPYRILENE		UNF	0/1	0/1	-		15 - 15	NA
METHYL METHACRYLATE		UNF	0/3	0/3	-		5 - 5	NA
METHYL METHANESULFONATE		UNF	0/1	0/1	-		15 - 15	NA
METOLACHLOR		UNF	0/1	0/1	-		1000 - 1000	NA
METRIBUZIN		UNF	0/1	0/1	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE		UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIETHYLAMINE		UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMETHYLETHYLAMINE		UNF	0/1	0/1	-		4 - 4	NA

000230
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TABLE E.2-6
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA A PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
N-NITROSOMORPHOLINE		UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPIPERIDINE		UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPYRROLIDINE		UNF	0/1	0/1	-		15 - 15	NA
O-TOLUIDINE		UNF	0/1	0/1	-		15 - 15	NA
P-DIMETHYLAMINOAZOBENZENE		UNF	0/1	0/1	-		15 - 15	NA
P-PHENYLENEDIAMINE		UNF	0/1	0/1	-		15 - 15	NA
PENTACHLOROBENZENE		UNF	0/1	0/1	-		4 - 4	NA
PENTACHLOROETHANE		UNF	0/3	0/3	-		5 - 5	NA
PENTACHLORONITROBENZENE		UNF	0/1	0/1	-		4 - 4	NA
PHENACETIN		UNF	0/1	0/1	-		4 - 4	NA
PRONAMIDE		UNF	0/1	0/1	-		15 - 15	NA
SAFROLE		UNF	0/1	0/1	-		15 - 15	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/4	0/4	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/4	0/4	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000231

TABLE E.2-7
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	13/14	11/14	2.69	.5 - 9.1	.2 - .2	0.9
URANIUM-238	pCi/L	UNF	15/17	14/17	2.5	.579 - 12.3	.2 - .2	0.64
URANIUM, TOTAL	ug/L	FIL	14/14	12/14	8.05	.5 - 26.8		0.8
URANIUM, TOTAL	ug/L	UNF	17/17	16/17	5.79	.7 - 27.2		1.2
URANIUM-234	pCi/L	FIL	12/13	11/13	3.1	.547 - 8.9	.5 - .5	0.9
URANIUM-234	pCi/L	UNF	15/17	14/17	2.1	.3 - 11.9	.2 - .2	0.8
THORIUM-230	pCi/L	FIL	3/13	3/13	-	.4 - .74	.2 - .3	0.29
THORIUM-230	pCi/L	UNF	4/17	1/17	-	.25 - 1.65	.2 - 1	0.89
RADIUM-226	pCi/L	FIL	0/13	0/13	-		1 - 1	1.9
RADIUM-226	pCi/L	UNF	1/17	0/17	-	12.3 - 12.3	1 - 1	105
LEAD-210	pCi/L	FIL	0/1	0/1	-		3 - 3	NA
URANIUM-235/236	pCi/L	FIL	3/13	3/13	-	.24 - .4	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	2/17	2/17	-	.3 - .6	.2 - 1	0.094
THORIUM-232	pCi/L	FIL	0/13	0/13	-		.2 - .3	0.3
THORIUM-232	pCi/L	UNF	2/17	2/17	-	.6 - 1.02	.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	1/7	0/7	-	2.736 - 2.736	.764 - 1.75	2.8
THORIUM, TOTAL	ug/L	UNF	5/17	4/17	-	.912 - 9.18	.5 - 4	0.97
RADIUM-228	pCi/L	FIL	0/14	0/14	-		3 - 5.65	ND
RADIUM-228	pCi/L	UNF	2/17	2/17	-	3.7 - 5.1	3 - 3	3.6
THORIUM-228	pCi/L	FIL	2/13	0/13	-	.21 - .3	.2 - .49	0.4
THORIUM-228	pCi/L	UNF	1/17	1/17	-	1.69 - 1.69	.2 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	1/6	1/6	-	.7383 - .7383	.5 - .5	0.12
NEPTUNIUM-237	pCi/L	UNF	0/16	0/16	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/6	0/6	-		.5 - .5	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/17	0/17	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/7	0/7	-		.5 - .5	ND
PLUTONIUM-238	pCi/L	UNF	0/17	0/17	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/7	0/7	-		1 - 2.68	ND
STRONTIUM-90	pCi/L	UNF	0/17	0/17	-		1 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/7	0/7	-		15 - 15	ND
TECHNETIUM-99	pCi/L	UNF	1/17	1/17	-	36.6 - 36.6	15 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/6	0/6	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/16	0/16	-		150 - 168	ND
CESIUM-137	pCi/L	FIL	0/7	0/7	-		4 - 19.3	ND
CESIUM-137	pCi/L	UNF	0/17	0/17	-		6.1 - 20	ND
GROSS ALPHA	pCi/L	FIL	7/12	7/12	4.04	3.3 - 17.91	2.4 - 8.19	NA
GROSS ALPHA	pCi/L	UNF	8/16	8/16	5.65	6.4 - 29.2	2 - 9.8	NA
GROSS BETA	pCi/L	FIL	9/12	9/12	6.85	5.4 - 69.7	2.8 - 5.04	NA
GROSS BETA	pCi/L	UNF	11/16	11/16	7.19	5.08 - 29.5	1.8 - 22.2	NA
ALUMINUM	mg/L	FIL	2/16	0/16	-	.0336 - .0491	.0195 - .5	0.175
ALUMINUM	mg/L	UNF	8/16	4/16	-	.0321 - 2.41	.02 - .0962	0.225
ANTIMONY	mg/L	FIL	0/15	0/15	-		.001 - .0587	ND
ANTIMONY	mg/L	UNF	0/16	0/16	-		.0032 - .0587	ND
ARSENIC	mg/L	FIL	1/16	0/16	-	.0011 - .0011	.001 - .003	0.26
ARSENIC	mg/L	UNF	3/16	0/16	-	.0011 - .013	.001 - .0034	0.0294
BARIUM	mg/L	FIL	15/16	0/16	0.042	.037 - .0698	.2 - .2	0.669
BARIUM	mg/L	UNF	15/16	0/16	0.042	.0331 - .0693	.2 - .2	0.768
BERYLLIUM	mg/L	FIL	0/15	0/15	-		.0005 - .01	0.0022
BERYLLIUM	mg/L	UNF	0/16	0/16	-		.0008 - .01	ND
CADMIUM	mg/L	FIL	0/16	0/16	-		.001 - .0037	0.006
CADMIUM	mg/L	UNF	1/16	0/16	-	.0022 - .0022	.001 - .005	0.0135
CALCIUM	mg/L	FIL	16/16	0/16	92.2	78.3 - 119		136
CALCIUM	mg/L	UNF	16/16	0/16	95.8	80.2 - 122		159

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TABLE E.2-7
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHROMIUM	mg/L	FIL	1/16	0/16	-	.02 - .02	.003 - .01	0.03
CHROMIUM	mg/L	UNF	3/16	0/16	-	.0055 - .021	.003 - .0113	0.0211
COBALT	mg/L	FIL	0/15	0/15	-		.003 - .025	ND
COBALT	mg/L	UNF	1/16	0/16	-	.0065 - .0065	.003 - .025	0.0086
COPPER	mg/L	FIL	2/16	0/16	-	.0032 - .0053	.002 - .025	0.083
COPPER	mg/L	UNF	2/16	0/16	-	.0036 - .0072	.002 - .025	0.0354
CYANIDE	mg/L	FIL	0/11	0/11	-		0 - .01	ND
CYANIDE	mg/L	UNF	0/16	0/16	-		0 - .01	ND
IRON	mg/L	FIL	3/16	0/16	-	.062 - 2.06	.012 - .0976	4.14
IRON	mg/L	UNF	11/16	1/16	0.32	.101 - 13.8	.015 - .176	5.72
LEAD	mg/L	FIL	1/16	0/16	-	.001 - .001	.001 - .005	0.009
LEAD	mg/L	UNF	4/16	4/16	-	.0026 - .023	.001 - .0032	0.002
MAGNESIUM	mg/L	FIL	15/16	0/16	24.2	19.7 - 27.4	21.4 - 21.4	37.8
MAGNESIUM	mg/L	UNF	16/16	1/16	25.4	20.4 - 60		38.5
MANGANESE	mg/L	FIL	6/16	0/16	-	.006 - .348	.001 - .0049	0.78
MANGANESE	mg/L	UNF	11/16	1/16	0.034	.0135 - 1.29	.001 - .01	0.904
MERCURY	mg/L	FIL	0/16	0/16	-		.0001 - .0002	0.0004
MERCURY	mg/L	UNF	0/16	0/16	-		.0001 - .0002	ND
MOLYBDENUM	mg/L	FIL	3/15	0/15	-	.0071 - .0112	.003 - .025	0.025
MOLYBDENUM	mg/L	UNF	1/8	1/8	-	.0074 - .0074	.0032 - .025	ND
NICKEL	mg/L	FIL	2/16	1/16	-	.008 - .0294	.003 - .031	0.023
NICKEL	mg/L	UNF	2/16	0/16	-	.0075 - .029	.003 - .031	0.0514
POTASSIUM	mg/L	FIL	12/16	2/16	2.13	1.23 - 3.45	2.68 - 4.15	3.32
POTASSIUM	mg/L	UNF	12/16	10/16	2.44	1.27 - 4.1	2.77 - 2.98	1.96
SELENIUM	mg/L	FIL	0/16	0/16	-		.001 - .003	0.004
SELENIUM	mg/L	UNF	3/16	3/16	-	.0012 - .0024	.001 - .0025	0.00075
SILICON	mg/L	FIL	12/12	6/12	3.4	1.5 - 5.24		3.46
SILICON	mg/L	UNF	6/6	0/6	4.7	2.26 - 5.71		5.81
SILVER	mg/L	FIL	0/16	0/16	-		.001 - .01	0.0138
SILVER	mg/L	UNF	0/16	0/16	-		.001 - .01	0.0117
SODIUM	mg/L	FIL	16/16	0/16	11.8	7.17 - 26.7		55
SODIUM	mg/L	UNF	16/16	0/16	13	6.82 - 17.3		47.1
THALLIUM	mg/L	FIL	1/15	1/15	-	.0022 - .0022	.001 - .01	ND
THALLIUM	mg/L	UNF	0/16	0/16	-		.001 - .01	ND
VANADIUM	mg/L	FIL	0/16	0/16	-		.0021 - .05	0.0234
VANADIUM	mg/L	UNF	0/16	0/16	-		.0021 - .05	0.0117
ZINC	mg/L	FIL	2/16	0/16	-	.0037 - .0338	.002 - .033	0.0568
ZINC	mg/L	UNF	2/16	2/16	-	.0411 - .071	.0047 - .0522	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	1/16	1/16	-	11 - 11	1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	0/16	0/16	-		2 - 10	NA
2-HEXANONE	ug/L	UNF	0/16	0/16	-		2 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/16	0/16	-		2 - 10	NA
ACETONE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
BENZENE	ug/L	UNF	1/16	1/16	-	1 - 1	1 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/15	0/15	-		1 - 10	NA

000233

TABLE E.2-7
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BROMOFORM	ug/L	UNF	1/16	1/16	-	2 - 2	1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	2/16	2/16	-	9 - 26	1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
CHLOROFORM	ug/L	UNF	0/16	0/16	-		1 - 10	NA
CHLOROMETHANE	ug/L	UNF	1/16	1/16	-	13 - 13	1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
METHYLENE CHLORIDE	ug/L	UNF	1/16	1/16	-	1 - 1	1 - 10	NA
STYRENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
TETRACHLOROETHENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
TOLUENE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/17	0/17	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	1/16	1/16	-	1 - 1	1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/6	0/6	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/12	0/12	-		2 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/16	0/16	-		1 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/16	0/16	-		1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/13	0/13	-		1 - 10	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/13	0/13	-		1 - 10	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/9	0/9	-		25 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2,4-DINITROPHENOL	ug/L	UNF	0/9	0/9	-		25 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/2	0/2	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/10	0/10	-		10 - 10	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2-CHLOROPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2-METHYLPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
2-NITROANILINE	ug/L	UNF	0/9	0/9	-		25 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/9	0/9	-		10 - 20	NA
3-NITROANILINE	ug/L	UNF	0/9	0/9	-		25 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/9	0/9	-		25 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/9	0/9	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/9	0/9	-		10 - 10	NA
4-METHYLPHENOL	ug/L	UNF	0/9	0/9	-		10 - 10	NA
4-NITROANILINE	ug/L	UNF	0/9	0/9	-		25 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/9	0/9	-		25 - 50	NA
ACENAPHTHENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
ACENAPHTHYLENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
ANTHRACENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA

000234

TABLE E.2-7
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(A)PYRENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BENZOIC ACID	ug/L	UNF	0/9	0/9	-		50 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/8	0/8	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/9	0/9	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	1/9	1/9	-	41 - 41	10 - 10	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	3/9	3/9	-	1 - 2	10 - 10	NA
CARBAZOLE	ug/L	UNF	0/6	0/6	-		10 - 10	NA
CHRYSENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
CUMENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	1/9	1/9	-	8 - 8	6 - 10	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
DIBENZOFURAN	ug/L	UNF	0/9	0/9	-		10 - 10	NA
DIETHYL PHTHALATE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
FLUORANTHENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
FLUORENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROBENZENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
HEXACHLOROETHANE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
ISOPHORONE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/2	0/2	-		10 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/9	0/9	-		10 - 50	NA
NAPHTHALENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
NITROBENZENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
PENTACHLOROPHENOL	ug/L	UNF	0/10	0/10	-		25 - 50	NA
PHENANTHRENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
PHENOL	ug/L	UNF	1/9	1/9	-	50 - 50	10 - 10	NA
PYRENE	ug/L	UNF	0/9	0/9	-		10 - 10	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	0/2	0/2	-		10 - 10	NA
4,4'-DDD	ug/L	UNF	0/8	0/8	-		.1 - .1	NA
4,4'-DDE	ug/L	UNF	0/8	0/8	-		.1 - .1	NA
4,4'-DDT	ug/L	UNF	0/8	0/8	-		.1 - .1	NA
ALDRIN	ug/L	UNF	0/8	0/8	-		.05 - .05	NA
ALPHA-BHC	ug/L	UNF	0/8	0/8	-		.05 - .05	NA
ALPHA-CHLORDANE	ug/L	UNF	0/8	0/8	-		.05 - .5	NA
AROCLOR-1016	ug/L	UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1221	ug/L	UNF	0/8	0/8	-		.5 - 2	NA
AROCLOR-1232	ug/L	UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1242	ug/L	UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1248	ug/L	UNF	0/8	0/8	-		.5 - 1	NA
AROCLOR-1254	ug/L	UNF	0/8	0/8	-		1 - 1	NA
AROCLOR-1260	ug/L	UNF	0/8	0/8	-		1 - 1	NA
BETA-BHC	ug/L	UNF	0/8	0/8	-		.05 - .05	NA

000235

TABLE E.2-7
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
DELTA-BHC	ug/L	UNF	0/8	0/8	-		.05 - .05	NA
DIELDRIN	ug/L	UNF	0/8	0/8	-		.05 - .1	NA
ENDOSULFAN II	ug/L	UNF	0/8	0/8	-		.1 - .1	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/8	0/8	-		.1 - .1	NA
ENDOSULFAN-I	ug/L	UNF	0/8	0/8	-		.05 - .05	NA
ENDRIN	ug/L	UNF	0/9	0/9	-		.05 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/5	0/5	-		.1 - .1	NA
ENDRIN KETONE	ug/L	UNF	0/8	0/8	-		.1 - .1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/9	0/9	-		.05 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/9	0/9	-		.05 - .5	NA
HEPTACHLOR	ug/L	UNF	0/8	0/8	-		.05 - .05	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/8	0/8	-		.05 - .05	NA
METHOXYCHLOR	ug/L	UNF	0/9	0/9	-		.5 - 200	NA
TOXAPHENE	ug/L	UNF	0/10	0/10	-		1 - 500	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/2	0/2	-		500 - 500	NA
2,4-D	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/4	0/4	-		2.5 - 2000	NA
DEMETON	ug/L	UNF	0/4	0/4	-		.25 - 1000	NA
DIAZINON	ug/L	UNF	0/4	0/4	-		.25 - 500	NA
DISULFOTON	ug/L	UNF	0/4	0/4	-		.25 - 500	NA
ETHION	ug/L	UNF	0/4	0/4	-		.2 - 500	NA
MALATHION	ug/L	UNF	0/4	0/4	-		.25 - 1000	NA
METHYL PARATHION	ug/L	UNF	0/4	0/4	-		.25 - 1000	NA
PARATHION	ug/L	UNF	0/4	0/4	-		.25 - 500	NA
ALKALINITY AS CACO3	mg/L	UNF	17/17	17/17	256	188 - 344		NA
ALLYL CHLORIDE	-	UNF	0/1	0/1	-		5 - 5	NA
AMMONIA	mg/L	UNF	6/16	0/16	-	.02 - .3	.02 - .1	4.2
BICARBONATE	-	UNF	1/1	1/1	-	280 - 280		NA
BICARBONATE ALKALINITY	-	UNF	8/8	8/8	305	280 - 470		NA
CARBONATE ALKALINITY	-	UNF	0/8	0/8	-		3 - 30	NA
CHEMICAL OXYGEN DEMAND	-	UNF	0/2	0/2	-		10 - 10	NA
CHLORIDE	mg/L	UNF	17/17	0/17	23	6.45 - 31		73
FLUORIDE	mg/L	UNF	14/16	0/16	0.185	.13 - .28	.1 - .26	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	1/4	1/4	-	.02 - .02	.005 - .02	NA
NITRATE	mg/L	UNF	14/15	0/15	1.72	.18 - 2.86		11.4
NITRATE, AS NITROGEN	mg/L	UNF	9/9	9/9	2.26	.69 - 2.63		NA
NITRATE/NITRITE	mg/L	UNF	12/12	0/12	1.71	.59 - 2.52		4.1
NITRITE, AS NITROGEN	mg/L	UNF	0/1	0/1	-		.02 - .02	NA
PH	-	UNF	11/11	11/11	7.48	7.18 - 7.73		NA
PHENOLS	mg/L	UNF	1/16	0/16	-	.02 - .02	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	3/3	3/3	0.02	.01 - .3		NA
PHOSPHORUS	mg/L	UNF	7/16	7/16	-	.04 - 2.13	.02 - .306	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	11/11	11/11	601	570 - 786		NA
SULFATE	mg/L	UNF	17/17	0/17	77	45 - 135.5		197
SULFIDE	mg/L	UNF	4/13	4/13	-	.51 - 44.2	.5 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	10/10	0/10	375	394 - 528		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	5/16	0/16	-	.11 - 3.01	.1 - .3	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	3/17	0/17	-	1 - 2	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	2/16	0/16	-	.0102 - .0108	.01 - .05	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	2/11	2/11	-	.01 - .062	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	4/16	1/16	-	.11 - 2.9	-.077 - .1	0.9
TOTAL SOLIDS	mg/L	UNF	8/8	8/8	407	382 - 466		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/1	0/1	-		5 - 5	NA

TABLE E.2-7
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/1	0/1	-		5 - 5	NA
ACROLEIN	ug/L	UNF	0/1	0/1	-		50 - 50	NA
ACROLEIN	ug/L	UNF	0/1	0/1	-		50 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/1	0/1	-		50 - 50	NA
ALACHLOR	ug/L	UNF	0/2	0/2	-		2000 - 2000	NA
ATRAZINE	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/2	0/2	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
ETHYL CYANIDE	ug/L	UNF	0/1	0/1	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/1	0/1	-		5 - 5	NA
FONOFOS	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
IODOMETHANE	ug/L	UNF	0/1	0/1	-		5 - 5	NA
LINURON	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
METHACRYLONITRILE	ug/L	UNF	0/1	0/1	-		5 - 5	NA
METHYL METHACRYLATE	ug/L	UNF	0/1	0/1	-		5 - 5	NA
METOLACHLOR	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/2	0/2	-		1000 - 1000	NA
PENTACHLOROETHANE	ug/L	UNF	0/1	0/1	-		5 - 5	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/10	0/10	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/1	0/1	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000237

TABLE E.2-8
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/7	1/7	-	.3 - 2.1	.2 - .2	0.09
URANIUM-238	pCi/L	UNF	4/9	3/9	-	.5 - 11.8	.1 - 1	0.64
URANIUM, TOTAL	ug/L	FIL	7/7	6/7	1.3	.3 - 31.7		0.8
URANIUM, TOTAL	ug/L	UNF	9/9	5/9	3	.5 - 31.5		1.2
URANIUM-234	pCi/L	FIL	4/7	1/7	0.3	.3 - 2.1	.4 - .4	0.9
URANIUM-234	pCi/L	UNF	7/9	4/9	0.8	.3 - 10.5		0.8
THORIUM-230	pCi/L	FIL	0/7	0/7	-		.2 - .3	0.29
THORIUM-230	pCi/L	UNF	2/9	1/9	-	.4 - 1.09	.2 - .1	0.89
RADIUM-226	pCi/L	FIL	1/7	0/7	-	1.2 - 1.2	.4 - 1	1.9
RADIUM-226	pCi/L	UNF	1/9	0/9	-	7.5 - 7.5	.4 - 1	1.5
URANIUM-235/236	pCi/L	FIL	0/7	0/7	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	1/9	1/9	-	.5 - .5	.1 - .1	0.094
THORIUM-232	pCi/L	FIL	0/7	0/7	-		.2 - .2	0.3
THORIUM-232	pCi/L	UNF	0/9	0/9	-		.1 - .1	0.23
THORIUM, TOTAL	ug/L	FIL	2/2	0/2	1.824	1.824 - 1.824		NA
THORIUM, TOTAL	ug/L	UNF	2/8	2/8	-	1.3 - 6.14	1.7 - 5	0.97
RADIUM-228	pCi/L	FIL	0/7	0/7	-		1.9 - 3	ND
RADIUM-228	pCi/L	UNF	0/9	0/9	-		1.9 - 3	3.6
THORIUM-228	pCi/L	FIL	1/7	0/7	-	.3 - .3	.2 - .2	0.4
THORIUM-228	pCi/L	UNF	0/9	0/9	-		.1 - .1	0.77
NEPTUNIUM-237	pCi/L	UNF	0/8	0/8	-		.5 - .1	0.25
PLUTONIUM-239/240	pCi/L	UNF	0/8	0/8	-		.5 - .1	0.05
PLUTONIUM-238	pCi/L	UNF	0/8	0/8	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	UNF	0/8	0/8	-		5 - 5	0.65
TECHNETIUM-99	pCi/L	FIL	0/2	0/2	-		15 - 15	ND
TECHNETIUM-99	pCi/L	UNF	0/8	0/8	-		15 - 39	22
RUTHENIUM-106	pCi/L	UNF	0/8	0/8	-		150 - 150	ND
CESIUM-137	pCi/L	UNF	0/8	0/8	-		7.3 - 20	ND
GROSS ALPHA		FIL	2/7	2/7	-	2.7 - 10.1	1.1 - 3.6	NA
GROSS ALPHA		UNF	3/8	3/8	-	.5 - 14.2	.8 - 3.7	NA
GROSS BETA		FIL	5/7	5/7	4.2	3.9 - 11	2.5 - 3	NA
GROSS BETA		UNF	6/8	6/8	6.1	3.2 - 8.5	.7 - 4.9	NA
URANIUM-235		UNF	2/2	2/2	0.043	.034 - .0514		NA
URANIUM-236		UNF	1/2	1/2	0.05	.0987 - .0987	.001 - .001	NA
ALUMINUM	mg/L	FIL	0/9	0/9	-		.02 - .5	0.175
ALUMINUM	mg/L	UNF	0/8	0/8	-		.02 - .5	0.225
ANTIMONY	mg/L	FIL	0/8	0/8	-		.025 - .045	ND
ANTIMONY	mg/L	UNF	0/8	0/8	-		.025 - .045	ND
ARSENIC	mg/L	FIL	0/9	0/9	-		.001 - .003	0.26
ARSENIC	mg/L	UNF	2/8	0/8	-	.0012 - .008	.002 - .0038	0.0294
BARIUM	mg/L	FIL	9/9	0/9	0.038	.0354 - .059		0.669
BARIUM	mg/L	UNF	8/8	0/8	0.04	.0359 - .207		0.768
BERYLLIUM	mg/L	FIL	0/8	0/8	-		.001 - .01	0.0022
BERYLLIUM	mg/L	UNF	0/8	0/8	-		.001 - .01	ND
CADMIUM	mg/L	FIL	0/9	0/9	-		.002 - .005	0.006
CADMIUM	mg/L	UNF	0/8	0/8	-		.001 - .003	0.0135
CALCIUM	mg/L	FIL	9/9	0/9	79.6	65.5 - 103		136
CALCIUM	mg/L	UNF	8/8	0/8	77.1	66.6 - 103		159
CHROMIUM	mg/L	FIL	1/9	0/9	-	.0128 - 0.128	.003 - .01	0.03
CHROMIUM	mg/L	UNF	2/8	0/8	-	.0138 - .02	.003 - .0118	0.211

000238
6161

TABLE E.2-8
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
COBALT	mg/L	FIL	0/8	0/8	-		.006 - .025	ND
COBALT	mg/L	UNF	0/8	0/8	-		.006 0 - .025	0.0086
COPPER	mg/L	FIL	2/9	0/9	-	.0043 - .01	.004 - .012	0.083
COPPER	mg/L	UNF	1/8	0/8	-	.0037 - .0037	.004 - .0785	0.0354
CYANIDE	mg/L	FIL	0/8	0/8	-		0 - .01	ND
CYANIDE	mg/L	UNF	0/8	0/8	-		.005 - .01	ND
IRON	mg/L	FIL	5/9	1/9	0.04	.04 - 4.79	.0213 - .0325	4.14
IRON	mg/L	UNF	5/8	2/8	0.642	.203 - 21.8	.0315 - .152	5.72
LEAD	mg/L	FIL	1/9	0/9	-	.0022 - .0022	.00 1 - .0027	0.009
LEAD	mg/L	UNF	2/8	1/8	-	.0012 - .0061	.001 - .005	0.002
MAGNESIUM	mg/L	FIL	9/9	0/9	20.5	19.6 - 35.9		37.8
MAGNESIUM	mg/L	UNF	8/8	1/8	20.8	19.5 - 39.9		38.5
MANGANESE	mg/L	FIL	8/9	0/9	0.042	.0061 - .345	.0019 - .0019	0.78
MANGANESE	mg/L	UNF	8/8	1/8	0.114	.0063 - 1.13		0.904
MERCURY	mg/L	FIL	0/9	0/9	-		.002 - .001	0.0004
MERCURY	mg/L	UNF	0/8	0/8	-		.002 - .002	ND
MOLYBDENUM	mg/L	FIL	2/9	0/9	-	.0035 - .012	.01 - .02	0.025
MOLYBDENUM	mg/L	UNF	0/3	0/3	-		.0111 - .025	ND
NICKEL	mg/L	FIL	1/9	0/9	-	.02 - .02	.019 - .031	0.023
NICKEL	mg/L	UNF	0/8	0/8	-		.005 - .031	0.0514
POTASSIUM	mg/L	FIL	6/9	0/9	1.88	.81 - 2.72	1.61 - 3	3.32
POTASSIUM	mg/L	UNF	6/8	5/8	2.12	1.9 - 2.55	1 - 2.44	1.96
SELENIUM	mg/L	FIL	1/9	0/9	-	.0012 - .0012	.001 - .03	0.004
SELENIUM	mg/L	UNF	2/8	2/8	-	.001 - .0012	.001 - .0025	0.00075
SILICON	mg/L	FIL	7/7	0/7	2.8	1.8 - 3.36		3.46
SILICON	mg/L	UNF	1/1	0/1	-	3.35 - 3.35		5.81
SILVER	mg/L	FIL	0/9	0/9	-		.003 - .01	0.0138
SILVER	mg/L	UNF	0/8	0/8	-		.001 - .007	0.0117
SODIUM	mg/L	FIL	9/9	0/9	10.7	4.45 - 16.1		55
SODIUM	mg/L	UNF	8/8	0/8	11.2	5.7 - 16.2		47.1
THALLIUM	mg/L	FIL	0/8	0/8	-		.0015 - .01	ND
THALLIUM	mg/L	UNF	0/8	0/8	-		.001 - .01	ND
VANADIUM	mg/L	FIL	1/9	0/9	-	.0038 - .0038	.003 - .05	0.0234
VANADIUM	mg/L	UNF	0/8	0/8	-		.003 - .05	0.0117
ZINC	mg/L	FIL	0/8	0/8	-		.005 - .0216	0.0568
ZINC	mg/L	UNF	2/8	1/8	-	.0154 - .028	.005 - .0435	0.021
1,1,1,2-TETRACHLOROETHANE		UNF	0/1	0/1	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,1-DICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,1-DICHLOROETHENE		UNF	0/8	0/8	-		1 - 10	NA
1,2-DICHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/8	0/8	-		1 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/8	0/8	-		1 - 10	NA
2-BUTANONE		UNF	0/8	0/8	-		2 - 10	NA
2-HEXANONE		UNF	0/8	0/8	-		2 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/8	0/8	-		2 - 10	NA
ACETONE		UNF	0/8	0/8	-		2 - 10	NA
BENZENE		UNF	1/8	1/8	-	.3 - .3	1 - 10	NA

000239

TABLE E.2-8
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BROMODICHLOROMETHANE		UNF	0/8	0/8	-		1 - 10	NA
BROMOFORM		UNF	0/8	0/8	-		1 - 10	NA
BROMOMETHANE		UNF	0/8	0/8	-		1 -10	NA
CARBON DISULFIDE		UNF	2/8	2/8	-	.5 - 8	1 - 55	NA
CARBON TETRACHLORIDE		UNF	0/8	0/8	-		1 - 10	NA
CHLOROBENZENE		UNF	0/8	0/8	-		1 - 10	NA
CHLOROETHANE		UNF	0/8	0/8	-		1 - 10	NA
CHLOROFORM		UNF	1/8	1/8	-	.3 - .3	1 - 10	NA
CHLOROMETHANE		UNF	0/8	0/8	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/8	0/8	-		1 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/8	0/8	-		1 - 10	NA
ETHYLBENZENE		UNF	0/8	0/8	-		1 - 10	NA
METHYLENE CHLORIDE		UNF	1/8	1/8	-	.7 - .7	1 - 10	NA
STYRENE		UNF	0/8	0/8	-		1 - 10	NA
TETRACHLOROETHENE		UNF	0/8	0/8	-		1 - 10	NA
TOLUENE		UNF	1/8	1/8	-	.7 - .7	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/8	0/8	-		1 - 10	NA
TRICHLOROETHENE		UNF	0/8	0/8	-		1 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/2	0/2	-		1 - 10	NA
VINYL ACETATE		UNF	0/5	0/5	-		2 - 10	NA
VINYL CHLORIDE		UNF	0/8	0/8	-		1 - 10	NA
XYLENES, TOTAL		UNF	1/8	1/8	-	.5 - .5	1 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/2	0/2	-		1 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/2	0/2	-		1 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
2,4,6-TRICHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,4-DINITROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
2,4-DINITROTOLUENE		UNF	0/1	0/1	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/1	0/1	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/5	0/5	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/1	0/1	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/1	0/1	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2-NITROANILINE		UNF	0/1	0/1	-		50 - 50	NA
2-NITROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/1	0/1	-		20 - 20	NA
3-NITROANILINE		UNF	0/1	0/1	-		50 - 50	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/1	0/1	-		50 - 50	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/1	0/1	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/1	0/1	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
4-NITROANILINE		UNF	0/1	0/1	-		50 - 50	NA
4-NITROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
ACENAPHTHENE		UNF	0/1	0/1	-		10 - 10	NA

TABLE E.2-8
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ACENAPHTHYLENE		UNF	0/1	0/1	-		10 - 10	NA
ANTHRACENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/1	0/1	-		10 - 10	NA
BENZOIC ACID		UNF	0/1	0/1	-		50 - 50	NA
BENZYL ALCOHOL		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
CHRYSENE		UNF	0/1	0/1	-		10 - 10	NA
CUMENE		UNF	0/1	0/1	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/1	0/1	-		10 - 10	NA
DIBENZOFURAN		UNF	0/1	0/1	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
FLUORANTHENE		UNF	0/1	0/1	-		10 - 10	NA
FLUORENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/1	0/1	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/1	0/1	-		10 - 10	NA
ISOPHORONE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
NAPHTHALENE		UNF	0/1	0/1	-		10 - 10	NA
NITROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/1	0/1	-		10 - 10	NA
PENTACHLOROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
PHENANTHRENE		UNF	0/1	0/1	-		10 - 10	NA
PHENOL		UNF	1/1	1/1	-	2 - 2		NA
PYRENE		UNF	0/1	0/1	-		10 - 10	NA
ENDRIN		UNF	0/2	0/2	-		200 - 200	NA
GAMMA-BHC (LINDANE)		UNF	0/2	0/2	-		200 - 200	NA
METHOXYCHLOR		UNF	0/2	0/2	-		200 - 200	NA
TOXAPHENE		UNF	0/2	0/2	-		500 - 500	NA
2,4,5-TP (SILVEX)		UNF	0/2	0/2	-		500 - 500	NA
2,4-D		UNF	0/2	0/2	-		1000 - 1000	NA
ALKALINITY AS CACO3		UNF	8/8	8/8	220	206 - 330		NA
ALLYL CHLORIDE		UNF	0/1	0/1	-		5 - 5	NA
AMMONIA	mg/L	UNF	5/9	0/9	0.055	.04 - .2	.05 - .11	4.2
BICARBONATE		UNF	1/1	1/1	-	217 - 217		NA
BICARBONATE ALKALINITY		UNF	7/7	7/7	268	250 - 330		NA

000241

TABLE E.2-8
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBONATE ALKALINITY		UNF	1/7	1/7	-	1 - 1	3 - 30	NA
CHEMICAL OXYGEN DEMAND		UNF	0/2	0/2	-		10 - 10	NA
CHLORIDE	mg/L	UNF	9/9	0/9	22	1.55 - 24		73
FLUORIDE	mg/L	UNF	8/9	0/9	0.16	.1 - .58	.15 - .15	0.89
HEXAVALENT CHROMIUM		UNF	0/3	0/3	-		.02 - 2.76	NA
NITRATE	mg/L	UNF	6/9	0/9	1.2	.1 - 3.2	.013 - .1	11.4
NITRATE, AS NITROGEN		UNF	1/4	1/4	-	.68 - .68	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	5/7	0/7	1.26	.03 - 2.3	.02 - .05	4.1
NITRITE, AS NITROGEN		UNF	0/2	0/2	-		.02 - .02	NA
PH		UNF	8/8	8/8	7.59	7.24 - 8.19		
PHENOLS	mg/L	UNF	3/9	1/9	-	.004 - .003	.01 - .15	0.03
PHOSPHATE		UNF	2/2	2/2	0.38	.33 - .43		NA
PHOSPHORUS		UNF	4/9	4/9	-	.08 - .28	.03 - .306	0.954
SPECIFIC CONDUCTIVITY		UNF	8/8	8/8	571	557 - 672		NA
SULFATE	mg/L	UNF	9/9	0/9	68.9	48 - 96		197
SULFIDE		UNF	1/7	1/7	-	27.8 - 27.8	.5 - .5	ND
TOTAL DISSOLVED SOLIDS	mg/L	UNF	5/5	0/5	343	130 - 445		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	6/8	0/8	0.11	.1 - .205	.1 - .1	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	4/9	1/9	-	1.18 - 6	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	0/9	0/9	-		.01 - .05	0.052
TOTAL ORGANIC HALOGENS		UNF	0/6	0/6	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	1/9	0/9	-	.25 - .25	.1 - .11	0.9
TOTAL SOLIDS		UNF	7/7	0/7	370	368 - 410		711
1,2,3-TRICHLOROPROPANE		UNF	0/1	0/1	-		5 - 5	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/1	0/1	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/1	0/1	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/1	0/1	-		5 - 5	NA
ACROLEIN		UNF	0/1	0/1	-		50 - 50	NA
ACROLEIN		UNF	0/1	0/1	-		50 - 50	NA
ACRYLONITRILE		UNF	0/1	0/1	-		50 - 50	NA
ALACHLOR		UNF	0/2	0/2	-		2000 - 2000	NA
ATRAZINE		UNF	0/2	0/2	-		1000 - 1000	NA
CARBOFURAN		UNF	0/2	0/2	-		1000000 - 1000000	NA
CYANAZINE		UNF	0/2	0/2	-		1000 - 1000	NA
DICHLORODIFLUOROMETHANE		UNF	0/1	0/1	-		10 - 10	NA
ETHYL CYANIDE		UNF	0/1	0/1	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/1	0/1	-		5 - 5	NA
FONOFOS		UNF	0/2	0/2	-		1000 - 1000	NA
IODOMETHANE		UNF	0/1	0/1	-		5 - 5	NA
LINURON		UNF	0/2	0/2	-		1000 - 1000	NA
METHACRYLONITRILE		UNF	0/1	0/1	-		5 - 5	NA
METHYL METHACRYLATE		UNF	0/1	0/1	-		5 - 5	NA
METOLACHLOR		UNF	0/2	0/2	-		1000 - 1000	NA
METRIBUZIN		UNF	0/2	0/2	-		1000 - 1000	NA
PENTACHLOROETHANE		UNF	0/1	0/1	-		5 - 5	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/5	0/5	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/1	0/1	-		20 - 20	NA

TABLE E.2-8
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000243

TABLE E.2-9
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/4	0/4		.3 - .6		0.9
URANIUM-238	pCi/L	UNF	1/5	0/5	-	.6 - .6	.4 - 1	0.64
URANIUM, TOTAL	ug/L	FIL	1/4	0/4	-	.2 - .2	.1 - .1	0.8
URANIUM, TOTAL	ug/L	UNF	4/5	0/5	0.5	.2 - .7	1 - 1	1.2
URANIUM-234	pCi/L	FIL	2/4	0/4	0.45	.4 - .5	.6 - .6	0.9
URANIUM-234	pCi/L	UNF	4/5	1/5	0.5	.4 - 1.17	.4 - .4	0.8
THORIUM-230	pCi/L	FIL	0/4	0/4	-		.2 - .3	0.29
THORIUM-230	pCi/L	UNF	3/5	0/5	0.5	.4 - .5	.4 - 1	0.89
RADIUM-226	pCi/L	FIL	0/4	0/4	-		1 - 1	1.9
RADIUM-226	pCi/L	UNF	0/5	0/5	-		1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/4	0/4	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	0/5	0/5	-		.2 - 1	0.094
THORIUM-232	pCi/L	FIL	2/4	2/4	0.32	.5 - 1.2	.2 - .3	0.3
THORIUM-232	pCi/L	UNF	2/5	2/5	-	.3 - .5	.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	2/2	1/2	6.48	2.736 - 10.944		2.8
THORIUM, TOTAL	ug/L	UNF	4/5	3/5	1.82	.912 - 4.56	2.2 - 2.2	0.97
RADIUM-228	pCi/L	FIL	0/4	0/4	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/5	0/5	-		3 - 3.1	3.6
THORIUM-228	pCi/L	FIL	0/4	0/4	-		.2 - .3	0.4
THORIUM-228	pCi/L	UNF	0/5	0/5	-		.2 - 1	0.77
NEPTUNIUM-237	pCi/L	UNF	0/5	0/5	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/5	0/5	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/5	0/5	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	UNF	0/5	0/5	-		5 - 5	ND
TECHNETIUM-99	pCi/L	UNF	0/5	0/5	-		15 - 38.3	ND
RUTHENIUM-106	pCi/L	UNF	0/5	0/5	-		150 - 150	ND
CESIUM-137	pCi/L	UNF	0/5	0/5	-		5.7 - 9	ND
GROSS ALPHA		FIL	2/4	2/4	1.57	1.7 - 2.1	2.4 - 2.9	NA
GROSS ALPHA		UNF	3/4	3/4	2.25	.3 - 5.6	2.8 - 2.8	NA
GROSS BETA		FIL	2/4	2/4	2.45	3.7 - 4.5	2.2 - 2.4	NA
GROSS BETA		UNF	3/4	3/4	4.45	2.9 - 22.2	3.9 - 3.9	NA
URANIUM-235		UNF	0/2	0/2	-		.007 - 1	NA
URANIUM-236		UNF	0/1	0/1	-		.004 - .004	NA
ALUMINUM	mg/L	FIL	0/5	0/5	-		.014 - .06	0.175
ALUMINUM	mg/L	UNF	0/4	0/4	-		.036 - .0384	0.225
ANTIMONY	mg/L	FIL	0/4	0/4	-		.031 - .045	ND
ANTIMONY	mg/L	UNF	0/4	0/4	-		.031 - .045	ND
ARSENIC	mg/L	FIL	4/5	0/5	0.003	.0022 - .0043	.002 - .002	0.26
ARSENIC	mg/L	UNF	4/4	0/4	0.004	.0033 - .0052		0.0294
BARIUM	mg/L	FIL	5/5	0/5	0.047	.0345 - .0563		0.669
BARIUM	mg/L	UNF	4/4	0/4	0.049	.0347 - .0563		0.768
BERYLLIUM	mg/L	FIL	0/4	0/4	-		.001 - .003	0.0022
BERYLLIUM	mg/L	UNF	0/4	0/4	-		.001 - .0013	ND
CADMIUM	mg/L	FIL	1/5	0/5	-	.0031 - .0031	.002 - .003	0.006
CADMIUM	mg/L	UNF	0/4	0/4	-		.002 - .003	0.0135
CALCIUM	mg/L	FIL	5/5	0/5	86.3	6.16 - 98.3		136
CALCIUM	mg/L	UNF	4/4	0/4	88.1	83.7 - 89.9		159
CHROMIUM	mg/L	FIL	0/5	0/5	-		.003 - .01	0.03
CHROMIUM	mg/L	UNF	0/4	0/4	-		.003 - .0073	0.0211
COBALT	mg/L	FIL	0/4	0/4	-		.006 - .008	ND
COBALT	mg/L	UNF	0/4	0/4	-		.006 - .008	0.0086
COPPER	mg/L	FIL	1/5	0/5	-	.0079 - .0079	.004 - .01	0.083
COPPER	mg/L	UNF	0/4	0/4	-		.004 - .0154	0.0354

TABLE E.2-9
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CYANIDE	mg/L	FIL	0/4	0/4	-		.01 - .02	ND
CYANIDE	mg/L	UNF	0/4	0/4	-		.01 - .02	ND
IRON	mg/L	FIL	4/5	0/5	2.4	2.18 - 2.95	.01 - .01	4.14
IRON	mg/L	UNF	4/4	0/4	2.55	2.48 - 2.66		5.72
LEAD	mg/L	FIL	2/5	0/5	-	.001 - .0027	.001 - .002	0.009
LEAD	mg/L	UNF	0/4	0/4	-		.001 - .0015	0.002
MAGNESIUM	mg/L	FIL	5/5	0/5	22.6	.463 - 24.2		37.8
MAGNESIUM	mg/L	UNF	4/4	0/4	22.4	21.7 - 22.9		38.5
MANGANESE	mg/L	FIL	5/5	0/5	0.359	.129 - .458		0.78
MANGANESE	mg/L	UNF	4/4	0/4	0.385	.346 - .441		0.904
MERCURY	mg/L	FIL	0/5	0/5	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/4	0/4	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	2/5	0/5	-	.0035 - .01	.01 - .015	0.025
MOLYBDENUM	mg/L	UNF	0/4	0/4	-		.015 - .025	ND
NICKEL	mg/L	FIL	0/5	0/5	-		.019 - .031	0.023
NICKEL	mg/L	UNF	0/4	0/4	-		.019 - .031	0.0514
POTASSIUM	mg/L	FIL	2/5	0/5	-	1.39 - 1.85	.693 - 1.76	3.32
POTASSIUM	mg/L	UNF	2/4	0/4	0.995	1.05 - 1.15	1.65 - 1.88	1.96
SELENIUM	mg/L	FIL	1/5	0/5	-	.0015 - .0015	.002 - .002	0.004
SELENIUM	mg/L	UNF	0/4	0/4	-		.001 - .002	0.00075
SILICON	mg/L	FIL	2/2	1/2	3.25	.086 - 6.42		3.46
SILVER	mg/L	FIL	0/5	0/5	-		.003 - .01	0.0138
SILVER	mg/L	UNF	0/4	0/4	-		.003 - .003	0.0117
SODIUM	mg/L	FIL	5/5	0/5	11.1	5.68 - 14.9		55
SODIUM	mg/L	UNF	4/4	0/4	12.5	7.06 - 15.3		47.1
THALLIUM	mg/L	FIL	0/4	0/4	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/4	0/4	-		.001 - .01	ND
VANADIUM	mg/L	FIL	0/5	0/5	-		.004 - .01	0.0234
VANADIUM	mg/L	UNF	0/4	0/4	-		.004 - .007	0.0117
ZINC	mg/L	FIL	2/4	0/4	0.004	.0045 - .0173	.006 - .0065	0.0568
ZINC	mg/L	UNF	0/4	0/4	-		.006 - .0135	0.021
1,1,1,2-TETRACHLOROETHANE		UNF	0/1	0/1	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
1,1-DICHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
1,1-DICHLOROETHENE		UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/4	0/4	-		10 - 10	NA
2-BUTANONE		UNF	0/4	0/4	-		10 - 10	NA
2-HEXANONE		UNF	0/4	0/4	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/4	0/4	-		10 - 10	NA
ACETONE		UNF	0/4	0/4	-		10 - 10	NA
BENZENE		UNF	0/4	0/4	-		10 - 10	NA
BROMODICHLOROMETHANE		UNF	0/4	0/4	-		10 - 10	NA
BROMOFORM		UNF	0/4	0/4	-		10 - 10	NA
BROMOMETHANE		UNF	0/4	0/4	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/4	0/4	-		10 - 10	NA
CARBON TETRACHLORIDE		UNF	0/4	0/4	-		10 - 10	NA
CHLOROBENZENE		UNF	0/4	0/4	-		10 - 10	NA
CHLOROETHANE		UNF	0/4	0/4	-		10 - 10	NA
CHLOROFORM		UNF	0/4	0/4	-		10 - 10	NA

000245

TABLE E.2-9
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHLOROMETHANE		UNF	0/4	0/4	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/4	0/4	-		10 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/4	0/4	-		10 - 10	NA
ETHYLBENZENE		UNF	0/4	0/4	-		10 - 10	NA
METHYLENE CHLORIDE		UNF	0/4	0/4	-		10 - 10	NA
STYRENE		UNF	0/4	0/4	-		10 - 10	NA
TETRACHLOROETHENE		UNF	0/4	0/4	-		10 - 10	NA
TOLUENE		UNF	0/4	0/4	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/4	0/4	-		10 - 10	NA
TRICHLOROETHENE		UNF	0/4	0/4	-		10 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/1	0/1	-		1 - 1	NA
VINYL ACETATE		UNF	0/4	0/4	-		2 - 10	NA
VINYL CHLORIDE		UNF	0/4	0/4	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/4	0/4	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
2,4,6-TRICHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2,4-DINITROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
2,4-DINITROTOLUENE		UNF	0/1	0/1	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/1	0/1	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/4	0/4	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/1	0/1	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/1	0/1	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
2-NITROANILINE		UNF	0/1	0/1	-		50 - 50	NA
2-NITROPHENOL		UNF	0/1	0/1	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/1	0/1	-		20 - 20	NA
3-NITROANILINE		UNF	0/1	0/1	-		50 - 50	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/1	0/1	-		50 - 50	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/1	0/1	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/1	0/1	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/1	0/1	-		10 - 10	NA
4-NITROANILINE		UNF	0/1	0/1	-		50 - 50	NA
4-NITROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
ACENAPHTHENE		UNF	0/1	0/1	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/1	0/1	-		10 - 10	NA
ANTHRACENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/1	0/1	-		10 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/1	0/1	-		10 - 10	NA
BENZOIC ACID		UNF	0/1	0/1	-		50 - 50	NA
BENZYL ALCOHOL		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/1	0/1	-		10 - 10	NA

TABLE E.2-9
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/1	0/1	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
CHRYSENE		UNF	0/1	0/1	-		10 - 10	NA
CUMENE		UNF	0/1	0/1	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/1	0/1	-		10 - 10	NA
DIBENZOFURAN		UNF	0/1	0/1	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/1	0/1	-		10 - 10	NA
FLUORANTHENE		UNF	0/1	0/1	-		10 - 10	NA
FLUORENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/1	0/1	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/1	0/1	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/1	0/1	-		10 - 10	NA
ISOPHORONE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/1	0/1	-		10 - 10	NA
NAPHTHALENE		UNF	0/1	0/1	-		10 - 10	NA
NITROBENZENE		UNF	0/1	0/1	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/1	0/1	-		10 - 10	NA
PENTACHLOROPHENOL		UNF	0/1	0/1	-		50 - 50	NA
PHENANTHRENE		UNF	0/1	0/1	-		10 - 10	NA
PHENOL		UNF	0/1	0/1	-		10 - 10	NA
PYRENE		UNF	0/1	0/1	-		10 - 10	NA
4,4'-DDD		UNF	0/1	0/1	-		.1 - .1	NA
4,4'-DDE		UNF	0/1	0/1	-		.1 - .1	NA
4,4'-DDT		UNF	0/1	0/1	-		.1 - .1	NA
ALDRIN		UNF	0/1	0/1	-		.05 - .05	NA
ALPHA-BHC		UNF	0/1	0/1	-		.05 - .05	NA
ALPHA-CHLORDANE		UNF	0/1	0/1	-		.5 - .5	NA
AROCLOR-1016		UNF	0/1	0/1	-		.5 - .5	NA
AROCLOR-1221		UNF	0/1	0/1	-		.5 - .5	NA
AROCLOR-1232		UNF	0/1	0/1	-		.5 - .5	NA
AROCLOR-1242		UNF	0/1	0/1	-		.5 - .5	NA
AROCLOR-1248		UNF	0/1	0/1	-		.5 - .5	NA
AROCLOR-1254		UNF	0/1	0/1	-		1 - 1	NA
AROCLOR-1260		UNF	0/1	0/1	-		1 - 1	NA
BETA-BHC		UNF	0/1	0/1	-		.05 - .05	NA
DELTA-BHC		UNF	0/1	0/1	-		.05 - .05	NA
DIELDRIN		UNF	0/1	0/1	-		.1 - .1	NA
ENDOSULFAN II		UNF	0/1	0/1	-		.1 - .1	NA
ENDOSULFAN SULFATE		UNF	0/1	0/1	-		.1 - .1	NA
ENDOSULFAN-I		UNF	0/1	0/1	-		.05 - .05	NA
ENDRIN		UNF	0/4	0/4	-		.1 - 200	NA
ENDRIN KETONE		UNF	0/1	0/1	-		.1 - .1	NA
GAMMA-BHC (LINDANE)		UNF	0/4	0/4	-		.05 - 200	NA
GAMMA-CHLORDANE		UNF	0/1	0/1	-		.5 - .5	NA
HEPTACHLOR		UNF	0/1	0/1	-		.05 - .05	NA
HEPTACHLOR EPOXIDE		UNF	0/1	0/1	-		.05 - .05	NA

000247

TABLE E.2-9
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
METHOXYCHLOR		UNF	0/4	0/4	-		.5 - 200	NA
TOXAPHENE		UNF	0/4	0/4	-		1 - 500	NA
2,4,5-TP (SILVEX)		UNF	0/4	0/4	-		500 - 500	NA
2,4-D		UNF	0/4	0/4	-		1000 - 1000	NA
AZINPHOSMETHYL		UNF	0/1	0/1	-		.5 - .5	NA
DEMETON		UNF	0/1	0/1	-		.25 - .25	NA
DIAZINON		UNF	0/1	0/1	-		.25 - .25	NA
DISULFOTON		UNF	0/1	0/1	-		.25 - .25	NA
ETHION		UNF	0/1	0/1	-		.25 - .25	NA
MALATHION		UNF	0/1	0/1	-		.25 - .25	NA
METHYL PARATHION		UNF	0/1	0/1	-		.25 - .25	NA
PARATHION		UNF	0/1	0/1	-		.25 - .25	NA
ALKALINITY AS CACO3		UNF	4/4	4/4	-	300 - 332		NA
ALLYL CHLORIDE		UNF	0/1	0/1	-		5 - 5	NA
AMMONIA	mg/L	UNF	4/5	0/5	0.26	.26 - .4	.1 - .1	4.2
BICARBONATE		UNF	3/3	3/3	294	257 - 390		NA
BICARBONATE ALKALINITY		UNF	4/4	4/4	388	300 - 482		NA
CARBONATE ALKALINITY		UNF	0/4	0/4	-		3 - 30	NA
CHEMICAL OXYGEN DEMAND		UNF	0/4	0/4	-		10 - 10	NA
CHLORIDE	mg/L	UNF	5/5	0/5	12	2.63 - 24		73
FLUORIDE	mg/L	UNF	5/5	0/5	0.22	.2 - .32		0.89
HEXAVALENT CHROMIUM		UNF	0/4	0/4	-		.005 - .005	NA
NITRATE	mg/L	UNF	2/5	0/5	-	.04 - 1.36	.05 - .1	11.4
NITRATE, AS NITROGEN		UNF	0/4	0/4	-		.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	0/4	0/4	-		.02 - .05	4.1
NITRITE, AS NITROGEN		UNF	1/1	1/1	-	.04 - .04		NA
PH		UNF	4/4	4/4	7.75	7.6 - 7.93		NA
PHENOLS	mg/L	UNF	0/5	0/5	-		.01 - .15	0.03
PHOSPHATE		UNF	3/3	3/3	0.16	.16 - .22		NA
PHOSPHORUS		UNF	5/5	5/5	0.16	.09 - .2		NA
SPECIFIC CONDUCTIVITY		UNF	4/4	4/4	600	470 - 861		NA
SULFATE	mg/L	UNF	5/5	0/5	9.1	4 - 61.1		197
SULFIDE		UNF	1/2	1/2	20.1	40 - 40	.5 - .5	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	4/4	0/4	329	236 - 560		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	4/4	0/4	0.42	.3 - .7		3.3
TOTAL ORGANIC CARBON	mg/L	UNF	3/5	1/5	1.7	1.7 - 4.03	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/5	0/5	-	.03 - .03	.01 - .045	0.052
TOTAL ORGANIC HALOGENS		UNF	0/4	0/4	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	2/5	0/5	-	.198 - .2	-.34 - .1	0.9
TOTAL SOLIDS		UNF	4/4	4/4	418	300 - 587		NA
1,2,3-TRICHLOROPROPANE		UNF	0/1	0/1	-		5 - 5	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/1	0/1	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/1	0/1	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/1	0/1	-		5 - 5	NA
ACROLEIN		UNF	0/1	0/1	-		50 - 50	NA
ACROLEIN		UNF	0/1	0/1	-		50 - 50	NA
ACRYLONITRILE		UNF	0/1	0/1	-		50 - 50	NA
ALACHLOR		UNF	0/4	0/4	-		2000 - 2000	NA
ATRAZINE		UNF	0/4	0/4	-		1000 - 1000	NA
CARBOFURAN		UNF	0/4	0/4	-		1000000 - 1000000	NA
CYANAZINE		UNF	0/4	0/4	-		1000 - 1000	NA
DICHLORODIFLUOROMETHANE		UNF	0/1	0/1	-		10 - 10	NA
ETHYL CYANIDE		UNF	0/1	0/1	-		20 - 20	NA

000248

TABLE E.2-9
SUMMARY STATISTICS FOR FEMP WASTE STORAGE AREA B PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ETHYL METHACRYLATE		UNF	0/1	0/1	-		5 - 5	NA
FONOFOS		UNF	0/4	0/4	-		1000 - 1000	NA
IODOMETHANE		UNF	0/1	0/1	-		5 - 5	NA
LINURON		UNF	0/4	0/4	-		1000 - 1000	NA
METHACRYLONITRILE		UNF	0/1	0/1	-		5 - 5	NA
METHYL METHACRYLATE		UNF	0/1	0/1	-		5 - 5	NA
METOLACHLOR		UNF	0/4	0/4	-		1000 - 1000	NA
METRIBUZIN		UNF	0/4	0/4	-		1000 - 1000	NA
PENTACHLOROETHANE		UNF	0/1	0/1	-		5 - 5	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/4	0/4	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/1	0/1	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000249

TABLE E.2-10
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	12/13	10/13	1.2	.6 - 10.3		0.9
URANIUM-238	pCi/L	UNF	13/14	12/14	1.4	.5 - 15.5	.2 - .2	0.64
URANIUM, TOTAL	ug/L	FIL	13/13	11/13	3.8	.4 - 51.8		0.8
URANIUM, TOTAL	ug/L	UNF	14/14	11/14	3.8	.5 - 37		1.2
URANIUM-234	pCi/L	FIL	12/13	8/13	1.5	.52 - 8.7		0.9
URANIUM-234	pCi/L	UNF	14/14	9/14	1.6	.3 - 16.2		0.8
THORIUM-230	pCi/L	FIL	3/13	3/13	-	.3 - .3	.2 - .3	0.29
THORIUM-230	pCi/L	UNF	8/14	1/14	0.3	.3 - 2.8	.2 - .4	0.89
RADIUM-226	pCi/L	FIL	1/12	0/12	-	1.6 - 1.6	1 - 1	1.9
RADIUM-226	pCi/L	UNF	2/14	0/14	-	1.3 - 1.5	1 - 1	105
URANIUM-235/236	pCi/L	FIL	1/13	1/13	-	.3 - .3	.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	1/14	1/14	-	.5 - .5	.2 - .2	0.094
THORIUM-232	pCi/L	UNF	0/14	0/14	-		.2 - .5	0.23
THORIUM-232	pCi/L	FIL	2/13	2/13	-	.3 - .5	.2 - .3	0.3
THORIUM, TOTAL	ug/L	FIL	7/9	1/9	1.82	0 - 4.56	.5 - 4.1	2.8
THORIUM, TOTAL	ug/L	UNF	7/11	3/11	0.91	.912 - 2.7362	.5 - 6	0.97
RADIUM-228	pCi/L	FIL	0/13	0/13	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/14	0/14	-		3 - 3	3.6
THORIUM-228	pCi/L	FIL	1/13	0/13	-	.3 - .3	.2 - .3	0.4
THORIUM-228	pCi/L	UNF	1/14	0/14	-	.3 - .3	.2 - .3	0.77
NEPTUNIUM-237	pCi/L	FIL	0/2	0/2	-		.5 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/8	0/8	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/4	0/4	-		.5 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	1/10	1/10	-	.9 - .9	.5 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/10	0/10	-		.5 - 1	0.048
PLUTONIUM-238	pCi/L	FIL	0/4	0/4	-		.5 - 1	ND
STRONTIUM-90	pCi/L	UNF	0/10	0/10	-		1 - 5	ND
STRONTIUM-90	pCi/L	FIL	0/3	0/3	-		1.61 - 5	ND
TECHNETIUM-99	pCi/L	UNF	0/12	0/12	-		15 - 30	ND
TECHNETIUM-99	pCi/L	FIL	0/7	0/7	-		15 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/3	0/3	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/8	0/8	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/3	0/3	-		10.2 - 20	ND
CESIUM-137	pCi/L	UNF	1/10	1/10	-	20 - 20	4 - 7.8	ND
GROSS ALPHA	pCi/L	FIL	5/12	5/12	-	4.86 - 13.1	0 - 12.9	NA
GROSS ALPHA	pCi/L	UNF	9/14	9/14	5	2 - 21	3.7 - 11.5	NA
GROSS BETA	pCi/L	UNF	10/14	10/14	6.8	4.7 - 27.9	3.7 - 6.3	NA
GROSS BETA	pCi/L	FIL	9/12	9/12	7.7	4.2 - 13.4	4.4 - 9.6	NA
URANIUM-235	pCi/L	UNF	2/2	2/2	0.082	.0137 - .1519		NA
URANIUM-236	pCi/L	UNF	2/2	2/2	0.017	.0036 - .0316		NA
ALUMINUM	mg/L	FIL	0/13	0/13	-		.014 - .06	0.175
ALUMINUM	mg/L	UNF	7/14	0/14	0.037	.0424 - .149	.02 - .0629	0.225
ANTIMONY	mg/L	FIL	0/13	0/13	-		.0157 - .045	ND
ANTIMONY	mg/L	UNF	0/14	0/14	-		.0157 - .045	ND
ARSENIC	mg/L	FIL	2/13	0/13	-	.001 - .0011	.002 - .003	0.26
ARSENIC	mg/L	UNF	2/14	0/14	-	.001 - .0049	.002 - .0034	0.0294
BARIUM	mg/L	FIL	12/13	0/13	0.061	.0449 - .103	.029 - .029	0.669
BARIUM	mg/L	UNF	14/14	0/14	0.06	.0312 - .105		0.768
BERYLLIUM	mg/L	FIL	0/13	0/13	-		.0003 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/14	0/14	-		.0003 - .001	ND
CADMIUM	mg/L	FIL	3/13	3/13	-	.0065 - .0333	.002 - .0167	0.006
CADMIUM	mg/L	UNF	7/14	3/14	0.002	.0029 - .0459	.002 - .003	0.0135
CALCIUM	mg/L	FIL	13/13	8/13	167	101 - 334		136

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TABLE E.2-10
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	UNF	14/14	7/14	156	97.7 - 333		159
CHROMIUM	mg/L	FIL	1/13	0/13	-	.0046 - .0046	.003 - .006	0.03
CHROMIUM	mg/L	UNF	2/14	0/14	-	.0081 - .0118	.003 - .006	0.0211
COBALT	mg/L	UNF	2/14	2/14	-	.0093 - .0114	.0034 - .013	0.0086
COBALT	mg/L	FIL	4/13	4/13	-	.0088 - .0138	.0034 - .008	ND
COPPER	mg/L	UNF	0/14	0/14	-		.003 - .0134	0.0354
COPPER	mg/L	FIL	2/13	0/13	-	.0037 - .0046	.0027 - .0085	0.083
CYANIDE	mg/L	FIL	0/12	0/12	-		.01 - .02	ND
CYANIDE	mg/L	UNF	0/14	0/14	-		.01 - .02	ND
IRON	mg/L	FIL	13/13	1/13	3.15	.0319 - 5.02		4.14
IRON	mg/L	UNF	14/14	1/14	3.51	.0828 - 5.85		5.72
LEAD	mg/L	FIL	1/13	1/13	-	.0115 - .0115	.001 - .0053	0.009
LEAD	mg/L	UNF	3/14	2/14	-	.0011 - .0028	.001 - .0031	0.002
MAGNESIUM	mg/L	FIL	13/13	5/13	37	27.8 - 56.9		37.8
MAGNESIUM	mg/L	UNF	14/14	5/14	35.7	27.5 - 56.8		38.5
MANGANESE	mg/L	FIL	13/13	2/13	0.371	.123 - 1.05		0.78
MANGANESE	mg/L	UNF	14/14	2/14	0.392	.133 - 2.66		0.904
MERCURY	mg/L	FIL	0/13	0/13	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/14	0/14	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	1/12	0/12	-	.0123 - .0123	.0033 - .015	0.025
MOLYBDENUM	mg/L	UNF	1/6	1/6	-	.0142 - .0142	.01 - .025	ND
NICKEL	mg/L	FIL	0/13	0/13	-		.007 - .031	0.023
NICKEL	mg/L	UNF	1/14	0/14	-	.0116 - .0116	.007 - .031	0.0514
POTASSIUM	mg/L	FIL	11/13	2/13	2.46	2.09 - 5.89	2.98 - 3	3.32
POTASSIUM	mg/L	UNF	11/14	11/14	2.34	2.08 - 5.75	1.77 - 2.77	1.96
SELENIUM	mg/L	FIL	1/13	1/13	-	.011 - .011	.001 - .002	0.004
SELENIUM	mg/L	UNF	2/14	2/14	-	.0016 - .0112	.001 - .01	0.00075
SILICON	mg/L	FIL	8/8	8/8	5.16	4.81 - 5.8		3.46
SILVER	mg/L	FIL	0/13	0/13	-		.0029 - .007	0.0138
SILVER	mg/L	UNF	0/14	0/14	-		.0029 - .007	0.0117
SODIUM	mg/L	FIL	13/13	0/13	10.6	8.41 - 39		55
SODIUM	mg/L	UNF	14/14	0/14	10.3	7.48 - 39.8		47.1
THALLIUM	mg/L	FIL	0/13	0/13	-		.001 - .01	ND
THALLIUM	mg/L	UNF	0/14	0/14	-		.001 - .01	ND
VANADIUM	mg/L	FIL	0/13	0/13	-		.0029 - .007	0.0234
VANADIUM	mg/L	UNF	2/14	0/14	-	.0031 - .0051	.0029 - .007	0.0117
ZINC	mg/L	UNF	3/14	2/14	-	.0088 - .047	.0093 - .0358	0.021
ZINC	mg/L	FIL	5/13	1/13	-	.0074 - .0743	.002 - .0326	0.0568
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/3	0/3	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	1/14	1/14	-	3 - 3	10 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/14	0/14	-		10 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
2-BUTANONE	ug/L	UNF	1/14	1/14	-	11 - 11	10 - 10	NA
2-HEXANONE	ug/L	UNF	1/14	1/14	-	7 - 7	10 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	1/14	1/14	-	4 - 4	10 - 10	NA
ACETONE	ug/L	UNF	1/14	1/14	-	10 - 10	10 - 10	NA
BENZENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA

000251

TABLE E.2-10
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BROMOFORM	ug/L	UNF	0/14	0/14	-		10 - 10	NA
BROMOMETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
CARBON DISULFIDE	ug/L	UNF	2/14	2/14	-	1 - 2	10 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
CHLOROETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
CHLOROFORM	ug/L	UNF	0/14	0/14	-		10 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
METHYLENE CHLORIDE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
STYRENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
TETRACHLOROETHENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
TOLUENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/4	0/4	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/14	0/14	-		10 - 10	NA
XYLENES, TOTAL	ug/L	UNF	2/14	2/14	-	1 - 1	10 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/7	0/7	-		24 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2,4-DINITROPHENOL	ug/L	UNF	0/7	0/7	-		25 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-CHLOROPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
2-NITROANILINE	ug/L	UNF	0/7	0/7	-		24 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/7	0/7	-		10 - 20	NA
3-NITROANILINE	ug/L	UNF	0/7	0/7	-		24 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		24 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/7	0/7	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/7	0/7	-		10 - 10	NA
4-METHYLPHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
4-NITROANILINE	ug/L	UNF	0/7	0/7	-		24 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/7	0/7	-		24 - 50	NA
ACENAPHTHENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
ACENAPHTHYLENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
ANTHRACENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BENZO(A)PYRENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA

000252
1196

TABLE E.2-10
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(B)FLUORANTHENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BENZOIC ACID	ug/L	UNF	0/5	0/5	-		50 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/5	0/5	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/7	0/7	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	0/7	0/7	-		10 - 14	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
CARBAZOLE	ug/L	UNF	0/2	0/2	-		10 - 10	NA
CHRYSENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
CUMENE	ug/L	UNF	0/3	0/3	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	3/7	3/7	-	4 - 53	4 - 10	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
DIBENZOFURAN	ug/L	UNF	0/7	0/7	-		10 - 10	NA
DIETHYL PHTHALATE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
FLUORANTHENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
FLUORENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
HEXACHLOROBENZENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
HEXACHLOROETHANE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
ISOPHORONE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
NAPHTHALENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
NITROBENZENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
P-CHLOROANILINE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
PENTACHLOROPHENOL	ug/L	UNF	0/7	0/7	-		24 - 50	NA
PHENANTHRENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
PHENOL	ug/L	UNF	0/7	0/7	-		10 - 10	NA
PYRENE	ug/L	UNF	0/7	0/7	-		10 - 10	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
4,4'-DDD	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
4,4'-DDE	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
4,4'-DDT	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
ALDRIN	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
ALPHA-BHC	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
ALPHA-CHLORDANE	ug/L	UNF	0/7	0/7	-		.05 - .5	NA
AROCLOR-1016	ug/L	UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1221	ug/L	UNF	0/7	0/7	-		.5 - 2	NA
AROCLOR-1232	ug/L	UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1242	ug/L	UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1248	ug/L	UNF	0/7	0/7	-		.5 - 1	NA
AROCLOR-1254	ug/L	UNF	0/7	0/7	-		1 - 1	NA
AROCLOR-1260	ug/L	UNF	0/7	0/7	-		1 - 1	NA
BETA-BHC	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
DELTA-BHC	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
DIELDRIN	ug/L	UNF	0/7	0/7	-		.1 - .1	NA

000253

TABLE E.2-10
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ENDOSULFAN II	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
ENDOSULFAN-I	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
ENDRIN	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/2	0/2	-		.1 - .1	NA
ENDRIN KETONE	ug/L	UNF	0/7	0/7	-		.1 - .1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
GAMMA-CHLORDANE	ug/L	UNF	0/7	0/7	-		.05 - .5	NA
HEPTACHLOR	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/7	0/7	-		.05 - .051	NA
METHOXYCHLOR	ug/L	UNF	0/7	0/7	-		.5 - .51	NA
TOXAPHENE	ug/L	UNF	0/7	0/7	-		1 - 5.1	NA
AZINPHOSMETHYL	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DEMETON	ug/L	UNF	0/1	0/1	-		.4 - .4	NA
DIAZINON	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
DISULFOTON	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
ETHION	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
MALATHION	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
METHYL PARATHION	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
PARATHION	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
ALKALINITY AS CACO3	mg/L	UNF	14/14	14/14	280	256 - 310		NA
ALLYL CHLORIDE	-	UNF	0/3	0/3	-		5 - 5	NA
AMMONIA	mg/L	UNF	6/14	0/14	-	.03 - .13	.02 - .065	4.2
BICARBONATE	-	UNF	1/1	1/1	-	6 - 6		NA
BICARBONATE ALKALINITY	-	UNF	14/14	14/14	357	280 - 372		NA
CARBONATE ALKALINITY	-	UNF	0/14	0/14	-		1 - 30	NA
CHLORIDE	mg/L	UNF	14/14	1/14	20	15 - 77		73
FLUORIDE	mg/L	UNF	13/14	0/14	0.18	.14 - .23	.15 - .15	0.89
NITRATE	mg/L	UNF	2/12	0/12	-	.11 - .11	.02 - .1	11.4
NITRATE, AS NITROGEN	mg/L	UNF	2/5	2/5	-	.04 - .16	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	4/13	0/13	-	.02 - .11	.02 - .05	4.1
NITRITE, AS NITROGEN	mg/L	UNF	0/3	0/3	-		.02 - .02	NA
PH	-	UNF	14/14	14/14	7.28	6.97 - 7.8		NA
PHENOLS	mg/L	UNF	1/14	0/14	-	.011 - .011	.002 - .15	0.03
PHOSPHORUS	mg/L	UNF	3/14	3/14	-	.035 - .09	.03 - .1	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	14/14	14/14	1014	630 - 1720		NA
SULFATE	mg/L	UNF	14/14	8/14	259	87 - 740		197
SULFIDE	mg/L	UNF	2/10	2/10	-	.5 - 34.4	.5 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	6/6	1/6	457	158 - 920		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	9/13	0/13	0.15	.1 - .27	.1 - .16	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	5/14	2/14	-	1 - 4	1 - 1.9	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	2/14	0/14	-	.022 - .037	.01 - .045	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	0/9	0/9	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	FIL	0/1	0/1	-		1 - 1	not tested
TOTAL ORGANIC NITROGEN	mg/L	UNF	9/14	0/14	0.105	.1 - .25	-.26 - .1	0.9
TOTAL SOLIDS	mg/L	UNF	14/14	14/14	790	400 - 1680		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/3	0/3	-		2 - 2	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/3	0/3	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
ACROLEIN	ug/L	UNF	0/3	0/3	-		50 - 50	NA
ACROLEIN	ug/L	UNF	0/3	0/3	-		50 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/3	0/3	-		50 - 50	NA

000254

6161

TABLE E.2-10
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
ETHYL CYANIDE	ug/L	UNF	0/3	0/3	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
IODOMETHANE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
METHACRYLONITRILE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
METHYL METHACRYLATE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
PENTACHLOROETHANE	ug/L	UNF	0/3	0/3	-		5 - 5	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/7	0/7	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/3	0/3	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000255

TABLE E.2-11
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/6	2/6	0.95	.8 - 1.9	.2 - .2	0.9
URANIUM-238	pCi/L	UNF	2/7	2/7	-	.7 - .7	.2 - .8	0.64
URANIUM, TOTAL	ug/L	FIL	3/6	1/6	0.12	.2 - 3.8	.1 - .1	0.8
URANIUM, TOTAL	ug/L	UNF	4/7	1/7	0.2	.2 - 13.1	.1 - .1	1.2
URANIUM-234	pCi/L	FIL	3/6	2/6	0.8	.8 - 1.3	.2 - .2	0.9
URANIUM-234	pCi/L	UNF	1/7	0/7	-	.7 - .7	.2 - .4	0.8
THORIUM-230	pCi/L	FIL	2/6	2/6	-	.3 - .3	.2 - .2	0.29
THORIUM-230	pCi/L	UNF	3/7	0/7	-	.5 - .7	.2 - .4	0.89
RADIUM-226	pCi/L	FIL	0/6	0/6	-		1 - 1	1.9
RADIUM-226	pCi/L	UNF	1/7	0/7	-	1.9 - 1.9	1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/6	0/6	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	0/7	0/7	-		.2 - .2	0.094
THORIUM-232	pCi/L	FIL	2/6	2/6	-	.3 - .6	.2 - .2	0.3
THORIUM-232	pCi/L	UNF	2/7	2/7	-	.3 - .6	.2 - .3	0.23
THORIUM, TOTAL	ug/L	FIL	3/3	0/3	0.912	.912 - .912		2.8
THORIUM, TOTAL	ug/L	UNF	6/6	5/6	1.824	.912 - 5.4721		0.97
RADIUM-228	pCi/L	FIL	0/6	0/6	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/7	0/7	-		3 - 3	3.6
THORIUM-228	pCi/L	FIL	0/6	0/6	-		.2 - .2	0.4
THORIUM-228	pCi/L	UNF	1/7	0/7	-	.3 - .3	.2 - .3	0.77
NEPTUNIUM-237	pCi/L	UNF	0/4	0/4	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/4	0/4	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/4	0/4	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	UNF	0/4	0/4	-		1 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/3	0/3	-		15 - 15	ND
TECHNETIUM-99	pCi/L	UNF	0/7	0/7	-		15 - 35.3	ND
RUTHENIUM-106	pCi/L	UNF	0/4	0/4	-			ND
CESIUM-137	pCi/L	UNF	0/4	0/4	-		4 - 4	ND
GROSS ALPHA		FIL	2/6	2/6	-	3.6 - 4.7	2.2 - 3.1	NA
GROSS ALPHA		UNF	2/7	2/7	-	2.8 - 4.2	2.8 - 3.9	NA
GROSS BETA		FIL	5/6	5/6	3.2	2.6 - 6.4	0 - 0	NA
GROSS BETA		UNF	4/7	4/7	2.7	2.7 - 8.4	3.3 - 3.6	NA
ALUMINUM	mg/L	FIL	0/6	0/6	-		.02 - .036	0.175
ALUMINUM	mg/L	UNF	1/7	1/7	-	.331 - .331	.02 - .036	0.225
ANTIMONY	mg/L	FIL	0/6	0/6	-		.03 - .045	ND
ANTIMONY	mg/L	UNF	0/7	0/7	-		.03 - .045	ND
ARSENIC	mg/L	FIL	0/6	0/6	-		.002 - .003	0.26
ARSENIC	mg/L	UNF	1/7	0/7	-	.0024 - .0024	.002 - .003	0.0294
BARIUM	mg/L	FIL	6/6	0/6	0.09	.0648 - .135		0.669
BARIUM	mg/L	UNF	7/7	0/7	0.1	.0706 - .208		0.768
BERYLLIUM	mg/L	FIL	0/6	0/6	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/7	0/7	-		.001 - .001	ND
CADMIUM	mg/L	FIL	0/6	0/6	-		.002 - .003	0.006
CADMIUM	mg/L	UNF	1/7	0/7	-	.0034 - .0034	.002 - .003	0.0135
CALCIUM	mg/L	FIL	6/6	0/6	96.9	86.6 - 109		136
CALCIUM	mg/L	UNF	7/7	0/7	101	84.5 - 102		159
CHROMIUM	mg/L	FIL	0/6	0/6	-		.003 - .006	0.03
CHROMIUM	mg/L	UNF	0/7	0/7	-		.003 - .0065	0.0211
COBALT	mg/L	FIL	2/6	2/6	-	.0059 - .0075	.008 - .008	ND
COBALT	mg/L	UNF	1/7	0/7	-	.0064 - .0064	.005 - .0093	0.0086
COPPER	mg/L	FIL	0/6	0/6	-		.003 - .0048	0.083
COPPER	mg/L	UNF	0/7	0/7	-		.003 - .0082	0.0354
CYANIDE	mg/L	FIL	0/6	0/6	-		.01 - .02	ND

TABLE E.2-11
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CYANIDE	mg/L	UNF	0/7	0/7	-		.01 - .02	ND
IRON	mg/L	FIL	5/6	0/6	2.51	.732 - 2.6	2.36 - 2.36	4.14
IRON	mg/L	UNF	7/7	0/7	1.94	1.86 - 5.35		5.72
LEAD	mg/L	FIL	1/6	0/6	-	.0033 - .0033	.001 - .0022	0.009
LEAD	mg/L	UNF	1/7	1/7	-	.0028 - .0028	.001 - .002	0.002
MAGNESIUM	mg/L	FIL	6/6	0/6	25.4	22.1 - 26.6		37.8
MAGNESIUM	mg/L	UNF	7/7	0/7	24.5	22.8 - 29.7		38.5
MANGANESE	mg/L	FIL	6/6	0/6	0.19	.165 - .271		0.78
MANGANESE	mg/L	UNF	7/7	0/7	0.177	.0888 - .271		0.904
MERCURY	mg/L	FIL	0/6	0/6	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/7	0/7	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	1/4	0/4	-	.01 - .01	.015 - .015	0.025
MOLYBDENUM	mg/L	UNF	0/3	0/3	-		.015 - .015	ND
NICKEL	mg/L	FIL	0/6	0/6	-		.01 - .031	0.023
NICKEL	mg/L	UNF	0/7	0/7	-		.01 - .031	0.0514
POTASSIUM	mg/L	FIL	4/6	0/6	1.82	1.52 - 2.43	1.5 - 1.51	3.32
POTASSIUM	mg/L	UNF	4/7	2/7	1.36	1.36 - 2.93	1.4 - 1.65	1.96
SELENIUM	mg/L	FIL	1/6	0/6	-	.0011 - .0011	.001 - .0036	0.004
SELENIUM	mg/L	UNF	0/7	0/7	-		.001 - .002	0.00075
SILICON	mg/L	FIL	1/1	1/1	-	4.4 - 4.4		3.46
SILVER	mg/L	FIL	1/6	0/6	-	.0049 - .0049	.003 - .007	0.0138
SILVER	mg/L	UNF	0/7	0/7	-		.003 - .007	0.0117
SODIUM	mg/L	FIL	6/6	0/6	9.87	8.48 - 13.7		55
SODIUM	mg/L	UNF	7/7	0/7	10	8.83 - 12.4		47.1
THALLIUM	mg/L	FIL	0/6	0/6	-		.002 - .01	ND
THALLIUM	mg/L	UNF	0/7	0/7	-		.002 - .01	ND
VANADIUM	mg/L	FIL	0/6	0/6	-		.003 - .007	0.0234
VANADIUM	mg/L	UNF	0/7	0/7	-		.003 - .007	0.0117
ZINC	mg/L	FIL	0/6	0/6	-		.002 - .0213	0.0568
ZINC	mg/L	UNF	0/7	0/7	-		.0074 - .301	0.021
1,1,1,2-TETRACHLOROETHANE		UNF	0/3	0/3	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/7	0/7	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/7	0/7	-		10 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/7	0/7	-		10 - 10	NA
1,1-DICHLOROETHANE		UNF	0/7	0/7	-		10 - 10	NA
1,1-DICHLOROETHENE		UNF	0/7	0/7	-		10 - 10	NA
1,2-DICHLOROETHANE		UNF	0/7	0/7	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/7	0/7	-		10 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/7	0/7	-		10 - 10	NA
2-BUTANONE		UNF	1/7	1/7	-	210 - 210	5 - 10	NA
2-HEXANONE		UNF	0/7	0/7	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/7	0/7	-		10 - 10	NA
ACETONE		UNF	0/7	0/7	-		10 - 10	NA
BENZENE		UNF	0/7	0/7	-		10 - 10	NA
BROMODICHLOROMETHANE		UNF	0/7	0/7	-		10 - 10	NA
BROMOFORM		UNF	0/7	0/7	-		10 - 10	NA
BROMOMETHANE		UNF	0/7	0/7	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/7	0/7	-		10 - 10	NA
CARBON TETRACHLORIDE		UNF	0/7	0/7	-		10 - 10	NA
CHLOROBENZENE		UNF	0/7	0/7	-		10 - 10	NA
CHLOROETHANE		UNF	0/7	0/7	-		10 - 10	NA
CHLOROFORM		UNF	0/7	0/7	-		10 - 10	NA
CHLOROMETHANE		UNF	0/7	0/7	-		10 - 10	NA

000257

TABLE E.2-11
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CIS-1,3-DICHLOROPROPENE		UNF	0/7	0/7	-		10 - 10	NA
DIBROMOCHLOROMETHANE		UNF	0/7	0/7	-		10 - 10	NA
ETHYLBENZENE		UNF	0/7	0/7	-		10 - 10	NA
METHYLENE CHLORIDE		UNF	1/7	1/7	-	2 - 2	10 - 10	NA
STYRENE		UNF	0/7	0/7	-		10 - 10	NA
TETRACHLOROETHENE		UNF	0/7	0/7	-		10 - 10	NA
TOLUENE		UNF	1/7	1/7	-	32 - 32	10 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/7	0/7	-		10 - 10	NA
TRICHLOROETHENE		UNF	0/7	0/7	-		10 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/3	0/3	-		1 - 1	NA
VINYL ACETATE		UNF	0/4	0/4	-		2 - 10	NA
VINYL CHLORIDE		UNF	0/7	0/7	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/7	0/7	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/1	0/1	-		11 - 11	NA
1,2-DICHLOROBENZENE		UNF	0/1	0/1	-		11 - 11	NA
1,3-DICHLOROBENZENE		UNF	0/1	0/1	-		11 - 11	NA
1,4-DICHLOROBENZENE		UNF	0/1	0/1	-		11 - 11	NA
2,4,5-TRICHLOROPHENOL		UNF	0/1	0/1	-		27 - 27	NA
2,4,6-TRICHLOROPHENOL		UNF	0/1	0/1	-		11 - 11	NA
2,4-DICHLOROPHENOL		UNF	0/1	0/1	-		11 - 11	NA
2,4-DIMETHYLPHENOL		UNF	0/1	0/1	-		11 - 11	NA
2,4-DINITROPHENOL		UNF	0/1	0/1	-			NA
2,4-DINITROTOLUENE		UNF	0/1	0/1	-		11 - 11	NA
2,6-DINITROTOLUENE		UNF	0/1	0/1	-		11 - 11	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/4	0/4	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/1	0/1	-		11 - 11	NA
2-CHLOROPHENOL		UNF	0/1	0/1	-		11 - 11	NA
2-METHYLNAPHTHALENE		UNF	0/1	0/1	-		11 - 11	NA
2-METHYLPHENOL		UNF	0/1	0/1	-		11 - 11	NA
2-NITROANILINE		UNF	0/1	0/1	-		27 - 27	NA
2-NITROPHENOL		UNF	0/1	0/1	-		11 - 11	NA
3,3'-DICHLOROBENZIDINE		UNF	0/1	0/1	-		11 - 11	NA
3-NITROANILINE		UNF	0/1	0/1	-		27 - 27	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/1	0/1	-		27 - 27	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/1	0/1	-		11 - 11	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/1	0/1	-		11 - 11	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/1	0/1	-		11 - 11	NA
4-METHYLPHENOL		UNF	0/1	0/1	-		11 - 11	NA
4-NITROANILINE		UNF	0/1	0/1	-		27 - 27	NA
4-NITROPHENOL		UNF	0/1	0/1	-		27 - 27	NA
ACENAPHTHENE		UNF	0/1	0/1	-		11 - 11	NA
ACENAPHTHYLENE		UNF	0/1	0/1	-		11 - 11	NA
ANTHRACENE		UNF	0/1	0/1	-		11 - 11	NA
BENZO(A)ANTHRACENE		UNF	0/1	0/1	-		11 - 11	NA
BENZO(A)PYRENE		UNF	0/1	0/1	-		11 - 11	NA
BENZO(B)FLUORANTHENE		UNF	0/1	0/1	-		11 - 11	NA
BENZO(G,H,I)PERYLENE		UNF	0/1	0/1	-		11 - 11	NA
BENZO(K)FLUORANTHENE		UNF	0/1	0/1	-		11 - 11	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/1	0/1	-		11 - 11	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/1	0/1	-		11 - 11	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/1	0/1	-		11 - 11	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	0/1	0/1	-		11 - 11	NA
BUTYL BENZYL PHTHALATE		UNF	0/1	0/1	-		11 - 11	NA

000258
6161

TABLE E.2-11
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBAZOLE		UNF	0/1	0/1	-		11 - 11	NA
CHRYSENE		UNF	0/1	0/1	-		11 - 11	NA
CUMENE		UNF	0/3	0/3	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	0/1	0/1	-		11 - 11	NA
DI-N-OCTYL PHTHALATE		UNF	0/1	0/1	-		11 - 11	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/1	0/1	-		11 - 11	NA
DIBENZOFURAN		UNF	0/1	0/1	-		11 - 11	NA
DIETHYL PHTHALATE		UNF	0/1	0/1	-		11 - 11	NA
DIMETHYL PHTHALATE		UNF	0/1	0/1	-		11 - 11	NA
FLUORANTHENE		UNF	0/1	0/1	-		11 - 11	NA
FLUORENE		UNF	0/1	0/1	-		11 - 11	NA
HEXACHLOROBENZENE		UNF	0/1	0/1	-		11 - 11	NA
HEXACHLOROBUTADIENE		UNF	0/1	0/1	-		11 - 11	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/1	0/1	-		11 - 11	NA
HEXACHLOROETHANE		UNF	0/1	0/1	-		11 - 11	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/1	0/1	-		11 - 11	NA
ISOPHORONE		UNF	0/1	0/1	-		11 - 11	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/1	0/1	-		11 - 11	NA
N-NITROSODIPHENYLAMINE		UNF	0/1	0/1	-		11 - 11	NA
NAPHTHALENE		UNF	0/1	0/1	-		11 - 11	NA
NITROBENZENE		UNF	0/1	0/1	-		11 - 11	NA
P-CHLOROANILINE		UNF	0/1	0/1	-		11 - 11	NA
PENTACHLOROPHENOL		UNF	0/1	0/1	-		27 - 27	NA
PHENANTHRENE		UNF	0/1	0/1	-		11 - 11	NA
PHENOL		UNF	0/1	0/1	-		11 - 11	NA
PYRENE		UNF	0/1	0/1	-		11 - 11	NA
4,4'-DDD		UNF	0/1	0/1	-		.1 - .1	NA
4,4'-DDE		UNF	0/1	0/1	-		.1 - .1	NA
4,4'-DDT		UNF	0/1	0/1	-		.1 - .1	NA
ALDRIN		UNF	0/1	0/1	-		.051 - .051	NA
ALPHA-BHC		UNF	0/1	0/1	-		.051 - .051	NA
ALPHA-CHLORDANE		UNF	0/1	0/1	-		.051 - .051	NA
AROCLOR-1016		UNF	0/1	0/1	-		1 - 1	NA
AROCLOR-1221		UNF	0/1	0/1	-		2 - 2	NA
AROCLOR-1232		UNF	0/1	0/1	-		1 - 1	NA
AROCLOR-1242		UNF	0/1	0/1	-		1 - 1	NA
AROCLOR-1248		UNF	0/1	0/1	-		1 - 1	NA
AROCLOR-1254		UNF	0/1	0/1	-		1 - 1	NA
AROCLOR-1260		UNF	0/1	0/1	-		1 - 1	NA
BETA-BHC		UNF	0/1	0/1	-		.051 - .051	NA
DELTA-BHC		UNF	0/1	0/1	-		.051 - .051	NA
DIELDRIN		UNF	0/1	0/1	-		.1 - .1	NA
ENDOSULFAN II		UNF	0/1	0/1	-		.1 - .1	NA
ENDOSULFAN SULFATE		UNF	0/1	0/1	-		.1 - .1	NA
ENDOSULFAN-I		UNF	0/1	0/1	-		.051 - .051	NA
ENDRIN		UNF	0/1	0/1	-		.1 - .1	NA
ENDRIN ALDEHYDE		UNF	0/1	0/1	-		.1 - .1	NA
ENDRIN KETONE		UNF	0/1	0/1	-		.1 - .1	NA
GAMMA-BHC (LINDANE)		UNF	0/1	0/1	-		.051 - .051	NA
GAMMA-CHLORDANE		UNF	0/1	0/1	-		.051 - .051	NA
HEPTACHLOR		UNF	0/1	0/1	-		.051 - .051	NA
HEPTACHLOR EPOXIDE		UNF	0/1	0/1	-		.051 - .051	NA
METHOXYCHLOR		UNF	0/1	0/1	-		.51 - .51	NA

000259

TABLE E.2-11
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
TOXAPHENE		UNF	0/1	0/1	-		5.1 - 5.1	NA
ALKALINITY AS CACO3		UNF	7/7	7/7	252	243 - 270		NA
ALLYL CHLORIDE		UNF	0/3	0/3	-		5 - 5	NA
AMMONIA	mg/L	UNF	7/7	0/7	0.48	.08 - 1.02		4.2
BICARBONATE		UNF	1/1	1/1	-	228 - 228		NA
BICARBONATE ALKALINITY		UNF	7/7	7/7	342	260 - 378		NA
CARBONATE ALKALINITY		UNF	0/7	0/7	-		3 - 30	NA
CHLORIDE	mg/L	UNF	7/7	0/7	20	19 - 33		73
FLUORIDE	mg/L	UNF	6/7	0/7	0.19	.17 - .32	.15 - .15	0.89
NITRATE	mg/L	UNF	2/4	0/4	0.036	.062 - .15	.02 - .02	11.4
NITRATE, AS NITROGEN		UNF	0/1	0/1	-		.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	0/7	0/7	-		.02 - .05	4.1
NITRITE, AS NITROGEN		UNF	0/3	0/3	-		.02 - .02	NA
PH		UNF	7/7	7/7	7.5	7.36 - 7.97		NA
PHENOLS	mg/L	UNF	0/7	0/7	-		.01 - .15	0.03
PHOSPHATE		UNF	1/1	1/1	-	.72 - .72		NA
PHOSPHORUS		UNF	3/7	3/7	-	.39 - .58	.03 - .1	NA
SPECIFIC CONDUCTIVITY		UNF	7/7	7/7	614	370 - 849		NA
SULFATE	mg/L	UNF	7/7	0/7	75	73 - 84		197
SULFIDE		UNF	1/1	1/1	-	3.4 - 3.4		NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	3/3	0/3	414	385 - 422		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	7/7	0/7	0.5	.15 - 1.07		3.3
TOTAL ORGANIC CARBON	mg/L	UNF	3/7	1/7	-	1.1 - 140	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/7	0/7	-	.019 - .019	.01 - .045	0.052
TOTAL ORGANIC HALOGENS		UNF	0/3	0/3	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	1/7	0/7	-	.22 - .22	-1.7 - .13	0.9
TOTAL SOLIDS		UNF	7/7	0/7	447	418 - 506		711
1,2,3-TRICHLOROPROPANE		UNF	0/3	0/3	-		5 - 5	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/3	0/3	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/3	0/3	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/3	0/3	-		5 - 5	NA
ACROLEIN		UNF	0/3	0/3	-		50 - 50	NA
ACROLEIN		UNF	0/3	0/3	-		50 - 50	NA
ACRYLONITRILE		UNF	0/3	0/3	-		50 - 50	NA
DICHLORODIFLUOROMETHANE		UNF	0/3	0/3	-		10 - 10	NA
ETHYL CYANIDE		UNF	0/3	0/3	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/3	0/3	-		5 - 5	NA
IODOMETHANE		UNF	0/3	0/3	-		5 - 5	NA
METHACRYLONITRILE		UNF	0/3	0/3	-		5 - 5	NA
METHYL METHACRYLATE		UNF	0/3	0/3	-		5 - 5	NA
PENTACHLOROETHANE		UNF	0/3	0/3	-		5 - 5	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/4	0/4	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/3	0/3	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

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TABLE E.2-12
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	2/2	1/2	1	.4 - 1.6		0.9
URANIUM-238	pCi/L	UNF	0/3	0/3	-		.2 - .7	0.64
URANIUM, TOTAL	ug/L	FIL	1/2	1/2	1	1.9 - 1.9	.1 - .1	0.8
URANIUM, TOTAL	ug/L	UNF	2/3	0/3	0.3	.3 - .3	.1 - .1	1.2
URANIUM-234	pCi/L	FIL	2/2	1/2	1	.8 - 1.2		0.9
URANIUM-234	pCi/L	UNF	1/3	0/3	-	.6 - .6	.2 - .2	0.8
THORIUM-230	pCi/L	FIL	2/2	2/2	0.4	.3 - .5		0.29
THORIUM-230	pCi/L	UNF	2/3	0/3	0.5	.5 - .5	.3 - .3	0.89
RADIUM-226	pCi/L	FIL	0/2	0/2	-		1 - 1	1.9
RADIUM-226	pCi/L	UNF	1/3	0/3	-	1.2 - 1.2	1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/2	0/2	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	0/3	0/3	-		.2 - .2	0.094
THORIUM-232	pCi/L	FIL	1/2	1/2	0.3	.5 - .5	.3 - .3	0.3
THORIUM-232	pCi/L	UNF	1/3	1/3	-	.5 - .5	.2 - .2	0.23
THORIUM, TOTAL	ug/L	FIL	2/2	0/2	1.368	.912 - 1.824		2.8
THORIUM, TOTAL	ug/L	UNF	2/2	2/2	3.648	2.736 - 4.56		0.97
RADIUM-228	pCi/L	FIL	0/2	0/2	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	1/3	0/3	-	3.1 - 3.1	3 - 3	3.6
THORIUM-228	pCi/L	FIL	0/2	0/2	-		.2 - .2	0.4
THORIUM-228	pCi/L	UNF	0/3	0/3	-		.2 - .3	0.77
NEPTUNIUM-237	pCi/L	UNF	0/2	0/2	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/3	0/3	-		.5 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/3	0/3	-		.5 - 1.6	0.048
STRONTIUM-90	pCi/L	UNF	0/3	0/3	-		1 - 5	ND
TECHNETIUM-99	pCi/L	UNF	0/3	0/3	-		15 - 30	ND
RUTHENIUM-106	pCi/L	UNF	0/2	0/2	-			ND
CESIUM-137	pCi/L	UNF	0/3	0/3	-		4 - 4.5	ND
GROSS ALPHA		FIL	2/2	2/2	3.4	2.4 - 4.3		NA
GROSS ALPHA		UNF	1/3	1/3	-	3.8 - 3.8	1 - 6.8	NA
GROSS BETA		FIL	2/2	2/2	3.5	3 - 4		NA
GROSS BETA		UNF	2/3	2/3	1.2	1.2 - 8.2	2.5 - 2.5	NA
ALUMINUM	mg/L	FIL	0/3	0/3	-		.02 - .036	0.175
ALUMINUM	mg/L	UNF	0/3	0/3	-		.02 - .036	0.225
ANTIMONY	mg/L	FIL	0/3	0/3	-		.03 - .031	ND
ANTIMONY	mg/L	UNF	0/3	0/3	-		.03 - .031	ND
ARSENIC	mg/L	FIL	3/3	0/3	0.01	.0033 - .0105		0.26
ARSENIC	mg/L	UNF	2/3	0/3	0.009	.0093 - .0119	.002 - .002	0.0294
BARIUM	mg/L	FIL	3/3	0/3	0.309	.0707 - .56		0.669
BARIUM	mg/L	UNF	3/3	0/3	0.295	.0708 - .584		0.768
BERYLLIUM	mg/L	FIL	0/3	0/3	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/3	0/3	-		.001 - .001	ND
CADMIUM	mg/L	FIL	0/3	0/3	-		.002 - .003	0.006
CADMIUM	mg/L	UNF	0/3	0/3	-		.002 - .003	0.0135
CALCIUM	mg/L	FIL	3/3	1/3	131	95.9 - 176		136
CALCIUM	mg/L	UNF	3/3	1/3	121	90.3 - 174		159
CHROMIUM	mg/L	FIL	1/3	0/3	-	.008 - .008	.003 - .006	0.03
CHROMIUM	mg/L	UNF	1/3	0/3	-	.0076 - .0076	.003 - .0105	0.0211
COBALT	mg/L	FIL	0/3	0/3	-		.005 - .008	ND
COBALT	mg/L	UNF	0/3	0/3	-		.0064 - .0095	0.0086
COPPER	mg/L	FIL	1/3	0/3	-	.0068 - .0068	.004 - .0054	0.083
COPPER	mg/L	UNF	0/3	0/3	-		.004 - .011	0.0354
CYANIDE	mg/L	FIL	0/2	0/2	-		.02 - .02	ND
CYANIDE	mg/L	UNF	0/3	0/3	-		.01 - .02	ND

000261

TABLE E.2-12
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
IRON	mg/L	FIL	3/3	2/3	5.14	3.15 - 7.5		4.14
IRON	mg/L	UNF	3/3	1/3	4.9	3.14 - 7.58		5.72
LEAD	mg/L	FIL	1/3	0/3	-	.0028 - .0028	.001 - .002	0.009
LEAD	mg/L	UNF	1/3	1/3	-	.002 - .002	.001 - .002	0.002
MAGNESIUM	mg/L	FIL	3/3	1/3	36.9	24.3 - 55.7		37.8
MAGNESIUM	mg/L	UNF	3/3	1/3	34.5	24 - 55.4		38.5
MANGANESE	mg/L	FIL	3/3	0/3	0.222	.0828 - .226		0.78
MANGANESE	mg/L	UNF	3/3	0/3	0.209	.082 - .217		0.904
MERCURY	mg/L	FIL	0/3	0/3	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/3	0/3	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/2	0/2	-		.015 - .015	0.025
MOLYBDENUM	mg/L	UNF	0/2	0/2	-		.015 - .015	ND
NICKEL	mg/L	FIL	0/3	0/3	-		.01 - .031	0.023
NICKEL	mg/L	UNF	0/3	0/3	-		.01 - .031	0.0514
POTASSIUM	mg/L	FIL	3/3	0/3	1.56	.913 - 1.65		3.32
POTASSIUM	mg/L	UNF	3/3	0/3	1.44	.991 - 1.53		1.96
SELENIUM	mg/L	FIL	0/3	0/3	-		.001 - .001	0.004
SELENIUM	mg/L	UNF	1/3	1/3	-	.0024 - .0024	.002 - .0021	0.00075
SILICON	mg/L	FIL	1/1	1/1	-	6.27 - 6.27		3.46
SILVER	mg/L	FIL	0/3	0/3	-		.003 - .004	0.0138
SILVER	mg/L	UNF	0/3	0/3	-		.003 - .004	0.0117
SODIUM	mg/L	FIL	3/3	0/3	30	9.74 - 36.3		55
SODIUM	mg/L	UNF	3/3	0/3	27.3	9.88 - 35.9		47.1
THALLIUM	mg/L	FIL	0/3	0/3	-		.002 - .01	ND
THALLIUM	mg/L	UNF	0/3	0/3	-		.002 - .002	ND
VANADIUM	mg/L	FIL	0/3	0/3	-		.003 - .007	0.0234
VANADIUM	mg/L	UNF	0/3	0/3	-		.003 - .007	0.0117
ZINC	mg/L	FIL	1/3	0/3	-	.0234 - .0234	.002 - .0136	0.0568
ZINC	mg/L	UNF	1/3	0/3	-	.0084 - .0084	.0028 - .0106	0.021
1,1,1,2-TETRACHLOROETHANE		UNF	0/2	0/2	-		1 - 1	NA
1,1,1-TRICHLOROETHANE		UNF	0/3	0/3	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE		UNF	0/3	0/3	-		10 - 10	NA
1,1,2-TRICHLOROETHANE		UNF	0/3	0/3	-		10 - 10	NA
1,1-DICHLOROETHANE		UNF	0/3	0/3	-		10 - 10	NA
1,1-DICHLOROETHENE		UNF	0/3	0/3	-		10 - 10	NA
1,2-DICHLOROETHANE		UNF	0/3	0/3	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)		UNF	0/3	0/3	-		10 - 10	NA
1,2-DICHLOROPROPANE		UNF	0/3	0/3	-		10 - 10	NA
2-BUTANONE		UNF	0/3	0/3	-		10 - 10	NA
2-HEXANONE		UNF	0/3	0/3	-		10 - 10	NA
4-METHYL-2-PENTANONE		UNF	0/3	0/3	-		10 - 10	NA
ACETONE		UNF	0/3	0/3	-		10 - 10	NA
BENZENE		UNF	0/3	0/3	-		10 - 10	NA
BROMODICHLOROMETHANE		UNF	0/3	0/3	-		10 - 10	NA
BROMOFORM		UNF	0/3	0/3	-		10 - 10	NA
BROMOMETHANE		UNF	0/3	0/3	-		10 - 10	NA
CARBON DISULFIDE		UNF	0/3	0/3	-		10 - 10	NA
CARBON TETRACHLORIDE		UNF	0/3	0/3	-		10 - 10	NA
CHLOROBENZENE		UNF	0/3	0/3	-		10 - 10	NA
CHLOROETHANE		UNF	0/3	0/3	-		10 - 10	NA
CHLOROFORM		UNF	0/3	0/3	-		10 - 10	NA
CHLOROMETHANE		UNF	1/3	1/3	-	12 - 12	10 - 10	NA
CIS-1,3-DICHLOROPROPENE		UNF	0/3	0/3	-		10 - 10	NA

000262

6161

TABLE E.2-12
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
DIBROMOCHLOROMETHANE		UNF	0/3	0/3	-		10 - 10	NA
ETHYLBENZENE		UNF	0/3	0/3	-		10 - 10	NA
METHYLENE CHLORIDE		UNF	0/3	0/3	-		10 - 10	NA
STYRENE		UNF	0/3	0/3	-		10 - 10	NA
TETRACHLOROETHENE		UNF	0/3	0/3	-		10 - 10	NA
TOLUENE		UNF	0/3	0/3	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE		UNF	0/3	0/3	-		10 - 10	NA
TRICHLOROETHENE		UNF	0/3	0/3	-		10 - 10	NA
TRICHLOROFLUOROMETHANE		UNF	0/2	0/2	-		1 - 1	NA
VINYL ACETATE		UNF	0/2	0/2	-		10 - 10	NA
VINYL CHLORIDE		UNF	0/3	0/3	-		10 - 10	NA
XYLENES, TOTAL		UNF	0/3	0/3	-		10 - 10	NA
1,2,4-TRICHLOROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
1,2-DICHLOROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
1,3-DICHLOROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
1,4-DICHLOROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
2,4,5-TRICHLOROPHENOL		UNF	0/2	0/2	-		26 - 26	NA
2,4,6-TRICHLOROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2,4-DICHLOROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2,4-DIMETHYLPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2,4-DINITROPHENOL		UNF	0/2	0/2	-		26 - 26	NA
2,4-DINITROTOLUENE		UNF	0/2	0/2	-		10 - 10	NA
2,6-DINITROTOLUENE		UNF	0/2	0/2	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER		UNF	0/2	0/2	-		10 - 10	NA
2-CHLORONAPHTHALENE		UNF	0/2	0/2	-		10 - 10	NA
2-CHLOROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2-METHYLNAPHTHALENE		UNF	0/2	0/2	-		10 - 10	NA
2-METHYLPHENOL		UNF	0/2	0/2	-		10 - 10	NA
2-NITROANILINE		UNF	0/2	0/2	-		26 - 26	NA
2-NITROPHENOL		UNF	0/2	0/2	-		10 - 10	NA
3,3'-DICHLOROBENZIDINE		UNF	0/2	0/2	-		10 - 10	NA
3-NITROANILINE		UNF	0/2	0/2	-		26 - 26	NA
4,6-DINITRO-2-METHYLPHENOL		UNF	0/2	0/2	-		26 - 26	NA
4-BROMOPHENYL PHENYL ETHER		UNF	0/2	0/2	-		10 - 10	NA
4-CHLORO-3-METHYLPHENOL		UNF	0/2	0/2	-		10 - 10	NA
4-CHLOROPHENYLPHENYL ETHER		UNF	0/2	0/2	-		10 - 10	NA
4-METHYLPHENOL		UNF	0/2	0/2	-		10 - 10	NA
4-NITROANILINE		UNF	0/2	0/2	-		26 - 26	NA
4-NITROPHENOL		UNF	0/2	0/2	-		26 - 26	NA
ACENAPHTHENE		UNF	0/2	0/2	-		10 - 10	NA
ACENAPHTHYLENE		UNF	0/2	0/2	-		10 - 10	NA
ANTHRACENE		UNF	0/2	0/2	-		10 - 10	NA
BENZO(A)ANTHRACENE		UNF	0/2	0/2	-		10 - 10	NA
BENZO(A)PYRENE		UNF	0/2	0/2	-		10 - 10	NA
BENZO(B)FLUORANTHENE		UNF	0/2	0/2	-		10 - 10	NA
BENZO(G,H,I)PERYLENE		UNF	0/2	0/2	-		10 - 10	NA
BENZO(K)FLUORANTHENE		UNF	0/2	0/2	-		10 - 10	NA
BIS(2-CHLOROETHOXY)METHANE		UNF	0/2	0/2	-		10 - 10	NA
BIS(2-CHLOROETHYL)ETHER		UNF	0/2	0/2	-		10 - 10	NA
BIS(2-CHLOROISOPROPYL) ETHER		UNF	0/2	0/2	-		10 - 10	NA
BIS(2-ETHYLHEXYL)PHTHALATE		UNF	0/2	0/2	-		10 - 10	NA
BUTYL BENZYL PHTHALATE		UNF	0/2	0/2	-		10 - 10	NA
CARBAZOLE		UNF	0/2	0/2	-		10 - 10	NA

000263

TABLE E.2-12
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHRYSENE		UNF	0/2	0/2	-		10 - 10	NA
CUMENE		UNF	0/2	0/2	-		1 - 1	NA
DI-N-BUTYL PHTHALATE		UNF	1/2	1/2	-	20 - 20	10 - 10	NA
DI-N-OCTYL PHTHALATE		UNF	0/2	0/2	-		10 - 10	NA
DIBENZO(A,H)ANTHRACENE		UNF	0/2	0/2	-		10 - 10	NA
DIBENZOFURAN		UNF	0/2	0/2	-		10 - 10	NA
DIETHYL PHTHALATE		UNF	0/2	0/2	-		10 - 10	NA
DIMETHYL PHTHALATE		UNF	0/2	0/2	-		10 - 10	NA
FLUORANTHENE		UNF	0/2	0/2	-		10 - 10	NA
FLUORENE		UNF	0/2	0/2	-		10 - 10	NA
HEXACHLOROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
HEXACHLOROBUTADIENE		UNF	0/2	0/2	-		10 - 10	NA
HEXACHLOROCYCLOPENTADIENE		UNF	0/2	0/2	-		10 - 10	NA
HEXACHLOROETHANE		UNF	0/2	0/2	-		10 - 10	NA
INDENO(1,2,3-CD)PYRENE		UNF	0/2	0/2	-		10 - 10	NA
ISOPHORONE		UNF	0/2	0/2	-		10 - 10	NA
N-NITROSO-DI-N-PROPYLAMINE		UNF	0/2	0/2	-		10 - 10	NA
N-NITROSODIPHENYLAMINE		UNF	0/2	0/2	-		10 - 10	NA
NAPHTHALENE		UNF	0/2	0/2	-		10 - 10	NA
NITROBENZENE		UNF	0/2	0/2	-		10 - 10	NA
P-CHLOROANILINE		UNF	0/2	0/2	-		10 - 10	NA
PENTACHLOROPHENOL		UNF	0/2	0/2	-		26 - 26	NA
PHENANTHRENE		UNF	0/2	0/2	-		10 - 10	NA
PHENOL		UNF	0/2	0/2	-		10 - 10	NA
PYRENE		UNF	0/2	0/2	-		10 - 10	NA
4,4'-DDD		UNF	0/2	0/2	-		.1 - .1	NA
4,4'-DDE		UNF	0/2	0/2	-		.1 - .1	NA
4,4'-DDT		UNF	0/2	0/2	-		.1 - .1	NA
ALDRIN		UNF	0/2	0/2	-		.05 - .05	NA
ALPHA-BHC		UNF	0/2	0/2	-		.05 - .05	NA
ALPHA-CHLORDANE		UNF	0/2	0/2	-		.05 - .05	NA
AROCLOR-1016		UNF	0/2	0/2	-		1 - 1	NA
AROCLOR-1221		UNF	0/2	0/2	-		2 - 2	NA
AROCLOR-1232		UNF	0/2	0/2	-		1 - 1	NA
AROCLOR-1242		UNF	0/2	0/2	-		1 - 1	NA
AROCLOR-1248		UNF	0/2	0/2	-		1 - 1	NA
AROCLOR-1254		UNF	0/2	0/2	-		1 - 1	NA
AROCLOR-1260		UNF	0/2	0/2	-		1 - 1	NA
BETA-BHC		UNF	0/2	0/2	-		.05 - .05	NA
DELTA-BHC		UNF	0/2	0/2	-		.05 - .05	NA
DIELDRIN		UNF	0/2	0/2	-		.1 - .1	NA
ENDOSULFAN II		UNF	0/2	0/2	-		.1 - .1	NA
ENDOSULFAN SULFATE		UNF	0/2	0/2	-		.1 - .1	NA
ENDOSULFAN-I		UNF	0/2	0/2	-		.05 - .05	NA
ENDRIN		UNF	0/2	0/2	-		.1 - .1	NA
ENDRIN ALDEHYDE		UNF	0/2	0/2	-		.1 - .1	NA
ENDRIN KETONE		UNF	0/2	0/2	-		.1 - .1	NA
GAMMA-BHC (LINDANE)		UNF	0/2	0/2	-		.05 - .05	NA
GAMMA-CHLORDANE		UNF	0/2	0/2	-		.05 - .05	NA
HEPTACHLOR		UNF	0/2	0/2	-		.05 - .05	NA
HEPTACHLOR EPOXIDE		UNF	0/2	0/2	-		.05 - .05	NA
METHOXYCHLOR		UNF	0/2	0/2	-		.5 - .5	NA
TOXAPHENE		UNF	0/2	0/2	-		5 - 5	NA

000264

6191

TABLE E.2-12
SUMMARY STATISTICS FOR FEMP PLANT 6 PLUME TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ALKALINITY AS CACO3		UNF	3/3	3/3	340	270 - 404		NA
ALLYL CHLORIDE		UNF	0/2	0/2	-		5 - 5	NA
AMMONIA	mg/L	UNF	3/3	0/3	1.2	.46 - 2.79		4.2
BICARBONATE		UNF	1/1	1/1	-	253 - 253		NA
BICARBONATE ALKALINITY		UNF	3/3	3/3	340	311 - 494		NA
CARBONATE ALKALINITY		UNF	0/3	0/3	-		3 - 30	NA
CHLORIDE	mg/L	UNF	3/3	1/3	49	18 - 166		73
FLUORIDE	mg/L	UNF	3/3	0/3	0.3	.24 - .45		0.89
NITRATE	mg/L	UNF	0/2	0/2	-		.02 - .02	11.4
NITRATE, AS NITROGEN		UNF	1/1	1/1	-	.03 - .03		NA
NITRATE/NITRITE	mg/L	UNF	0/3	0/3	-		.05 - .05	4.1
NITRITE, AS NITROGEN		UNF	0/2	0/2	-		.02 - .02	NA
PH		UNF	3/3	3/3	7.6	7.43 - 7.86		NA
PHENOLS	mg/L	UNF	0/3	0/3	-			NA
PHOSPHORUS		UNF	3/3	3/3	0.29	.042 - .41	.01 - .15	0.03
SPECIFIC CONDUCTIVITY		UNF	3/3	3/3	740	566 - 1670		NA
SULFATE	mg/L	UNF	3/3	0/3	99	35 - 172		197
SULFIDE		UNF	1/1	1/1	-	17.4 - 17.4		NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	3/3	1/3	489	283 - 922		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	3/3	0/3	0.73	.46 - 2.35		3.3
TOTAL ORGANIC CARBON	mg/L	UNF	3/3	0/3	1.7	1.1 - 2		2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/3	0/3	-	.01 - .01	.045 - .045	0.052
TOTAL ORGANIC HALOGENS		UNF	0/3	0/3	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	0/3	0/3	-		-.18 - .1	0.9
TOTAL SOLIDS		UNF	3/3	3/3	600	500 - 1080		NA
1,2,3-TRICHLOROPROPANE		UNF	0/2	0/2	-		5 - 5	NA
1,2-DIBROMO-3-CHLOROPROPANE		UNF	0/2	0/2	-		2 - 2	NA
1,2-DIBROMOETHANE		UNF	0/2	0/2	-		2 - 2	NA
2-CHLORO-1,3-BUTADIENE		UNF	0/2	0/2	-		5 - 5	NA
ACROLEIN		UNF	0/2	0/2	-		50 - 50	NA
ACROLEIN		UNF	0/2	0/2	-		50 - 50	NA
ACRYLONITRILE		UNF	0/2	0/2	-		50 - 50	NA
DICHLORODIFLUOROMETHANE		UNF	0/2	0/2	-		10 - 10	NA
ETHYL CYANIDE		UNF	0/2	0/2	-		20 - 20	NA
ETHYL METHACRYLATE		UNF	0/2	0/2	-		5 - 5	NA
IODOMETHANE		UNF	0/2	0/2	-		5 - 5	NA
METHACRYLONITRILE		UNF	0/2	0/2	-		5 - 5	NA
METHYL METHACRYLATE		UNF	0/2	0/2	-		5 - 5	NA
PENTACHLOROETHANE		UNF	0/2	0/2	-		5 - 5	NA
TRANS-1,2-DICHLOROETHENE		UNF	0/2	0/2	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE		UNF	0/2	0/2	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000265

TABLE E.2-13
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	UNF	11/12	11/12	4.8	.760 - 707	1.00 - 1.00	0.640
URANIUM-238	pCi/L	FIL	7/7	6/7	5.1	.440 - 381		0.900
URANIUM, TOTAL	ug/L	FIL	12/12	12/12	46.9	1.30 - 1130		0.800
URANIUM, TOTAL	ug/L	UNF	15/15	14/15	52.8	.900 - 2070		1.20
URANIUM-234	pCi/L	UNF	11/12	10/12	4.5	.682 - 662	1.00 - 1.00	0.800
URANIUM-234	pCi/L	FIL	7/7	6/7	4.7	.670 - 357.5		0.900
THORIUM-230	pCi/L	FIL	1/7	0/7	-	.253 - .253	.200 - .320	0.290
THORIUM-230	pCi/L	UNF	9/13	2/13	0.4	.211 - 2.06	.200 - 1.00	0.890
RADIUM-226	pCi/L	UNF	1/13	0/13	-	1.19 - 1.19	1.00 - 1.40	105
RADIUM-226	pCi/L	FIL	2/7	0/7	-	1.10 - 1.20	1.00 - 1.00	1.90
URANIUM-235/236	pCi/L	FIL	3/7	3/7	-	5.00 - 15.7	.200 - .200	ND
URANIUM-235/236	pCi/L	UNF	8/12	8/12	0.727	.460 - 31.7	.200 - 1.00	0.0940
THORIUM-232	pCi/L	UNF	1/13	1/13	-	1.05 - 1.05	.200 - 1.00	0.230
THORIUM-232	pCi/L	FIL	0/7	0/7	-		.200 - .300	0.300
THORIUM, TOTAL	ug/L	UNF	2/13	2/13	-	1.27 - 3.72	.750 - 4.30	0.970
THORIUM, TOTAL	ug/L	FIL	2/7	0/7	-	.912 - 1.82	.500 - 2.16	2.80
RADIUM-228	pCi/L	UNF	1/13	0/13	-	3.50 - 3.50	3.00 - 3.40	3.60
RADIUM-228	pCi/L	FIL	0/7	0/7	-		3.00 - 3.00	ND
THORIUM-228	pCi/L	FIL	1/7	1/7	-	.500 - .500	.200 - .380	0.400
THORIUM-228	pCi/L	UNF	1/13	0/13	-	.300 - .300	.200 - 1.00	0.770
NEPTUNIUM-237	pCi/L	FIL	1/4	0/4	-	0 - 0	.500 - .500	0.120
NEPTUNIUM-237	pCi/L	UNF	4/13	4/13	-	0 - .796	.500 - 1.00	ND
PLUTONIUM-239/240	pCi/L	FIL	0/5	0/5	-		.500 - .500	0.0420
PLUTONIUM-239/240	pCi/L	UNF	0/13	0/13	-		.500 - 1.00	0.0500
PLUTONIUM-238	pCi/L	UNF	1/13	1/13	-	.637 - .637	.500 - 1.00	0.0480
PLUTONIUM-238	pCi/L	FIL	0/5	0/5	-		.500 - .500	ND
STRONTIUM-90	pCi/L	FIL	1/4	1/4	-	1.17 - 1.17	1.00 - 1.00	ND
STRONTIUM-90	pCi/L	UNF	0/13	0/13	-		1.00 - 5.00	ND
TECHNETIUM-99	pCi/L	FIL	0/4	0/4	-		15.0 - 15.0	ND
TECHNETIUM-99	pCi/L	UNF	0/13	0/13	-		15.0 - 30.0	ND
RUTHENIUM-106	pCi/L	FIL	0/4	0/4	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/13	0/13	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/4	0/4	-		14.7 - 19.5	ND
CESIUM-137	pCi/L	UNF	0/13	0/13	-		5.10 - 18.0	ND
GROSS ALPHA	pCi/L	UNF	7/11	7/11	7	6.97 - 1410	5.32 - 10.2	NA
GROSS ALPHA	pCi/L	FIL	4/7	4/7	5.3	5.30 - 553	3.30 - 6.58	NA
GROSS BETA	pCi/L	FIL	5/7	5/7	9.5	5.12 - 150	3.10 - 6.02	NA
GROSS BETA	pCi/L	UNF	9/11	9/11	12.7	5.05 - 520	4.13 - 4.92	NA
ALUMINUM	mg/L	UNF	7/11	7/11	0.297	.234 - 5.11	.0200 - .223	0.225
ALUMINUM	mg/L	FIL	0/10	0/10	-		.0240 - .212	0.175
ANTIMONY	mg/L	UNF	1/11	1/11	-	.00510 - .00510	.00140 - .0450	ND
ANTIMONY	mg/L	FIL	0/10	0/10	-		.00100 - .0450	ND
ARSENIC	mg/L	UNF	5/11	0/11	-	.00120 - .00420	.001 - .002	0.0294
ARSENIC	mg/L	FIL	0/10	0/10	-		.00100 - .00300	0.260
BARIUM	mg/L	UNF	11/11	0/11	0.0486	.0398 - .0961		0.768
BARIUM	mg/L	FIL	10/10	0/10	0.0507	.0329 - .0805		0.669
BERYLLIUM	mg/L	FIL	1/10	0/10	-	.00200 - .00200	.00100 - .003600	0.00220
BERYLLIUM	mg/L	UNF	0/11	0/11	-		.00100 - .00220	ND
CADMIUM	mg/L	FIL	0/10	0/10	-		.00200 - .00500	0.00600
CADMIUM	mg/L	UNF	0/11	0/11	-		.00200 - .00500	0.0135
CALCIUM	mg/L	FIL	10/10	3/10	125	90.7 - 180		136
CALCIUM	mg/L	UNF	11/11	2/11	118	90.4 - 198		159
CHROMIUM	mg/L	FIL	1/10	1/10	-	.030 - .030	.00400 - .0100	0.0300

000266

6161

TABLE E.2-13
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHROMIUM	mg/L	UNF	4/11	3/11	-	.00520 - .0436	.00400 - .0100	0.0211
COBALT	mg/L	FIL	0/10	0/10	-		.00300 - .0200	ND
COBALT	mg/L	UNF	0/11	0/11	-		.00300 - .0100	0.00860
COPPER	mg/L	UNF	1/11	0/11	-	.0296 - .0296	.00200 - .0171	0.0354
COPPER	mg/L	FIL	0/10	0/10	-		.00300 - .0100	0.0830
CYANIDE	mg/L	FIL	1/7	1/7	-	.070 - .070	.0100 - .0200	ND
CYANIDE	mg/L	UNF	0/11	0/11	-		.00100 - .00200	ND
IRON	mg/L	FIL	2/10	0/10	-	.090 - .128	.005 - .0412	4.14
IRON	mg/L	UNF	9/11	1/11	0.865	.0329 - 15.1	.0329 - .0621	5.72
LEAD	mg/L	UNF	6/11	4/11	0.001	.00130 - .0160	.00100 - .00200	0.00200
LEAD	mg/L	FIL	0/10	0/10	-		.00100 - .00200	0.00900
MAGNESIUM	mg/L	UNF	11/11	2/11	33	23.6 - 60.2		38.5
MAGNESIUM	mg/L	FIL	10/10	1/10	31.6	22.3 - 40.3		37.8
MANGANESE	mg/L	FIL	5/10	0/10	0.003	.00260 - .0826	.001 - .010	0.780
MANGANESE	mg/L	UNF	10/11	1/11	0.053	.00200 - 1.22	.0100 - .0100	0.904
MERCURY	mg/L	FIL	1/10	0/10	-	.000300 - .000300	.000200 - .000200	0.000400
MERCURY	mg/L	UNF	0/11	0/11	-		.000200 - .000200	ND
MOLYBDENUM	mg/L	FIL	0/10	0/10	-		.00300 - .100	0.0250
MOLYBDENUM	mg/L	UNF	0/9	0/9	-		.00300 - .0250	ND
NICKEL	mg/L	UNF	3/11	0/11	-	.00720 - .0489	.00300 - .020	0.0514
NICKEL	mg/L	FIL	1/10	0/10	-	.00420 - .00420	.00300 - .0300	0.0230
POTASSIUM	mg/L	UNF	11/11	9/11	2.61	1.68 - 4.40		1.96
POTASSIUM	mg/L	FIL	9/10	2/10	2.35	1.50 - 4.17	2.87 - 2.87	3.32
SELENIUM	mg/L	FIL	5/10	2/10	0.001	.00160 - .00500	.001 - .002	0.00400
SELENIUM	mg/L	UNF	5/11	5/11	-	.00100 - .00650	.001 - .002	0.000750
SILICON	mg/L	UNF	8/8	2/8	5.09	3.45 - 12.8		5.81
SILICON	mg/L	FIL	9/9	8/9	4.68	3.14 - 5.79		3.46
SILVER	mg/L	FIL	0/10	0/10	-		.00200 - .0100	0.0138
SILVER	mg/L	UNF	0/11	0/11	-		.00200 - .0100	0.0117
SODIUM	mg/L	UNF	11/11	0/11	9.9	5.71 - 12.7		47.1
SODIUM	mg/L	FIL	10/10	0/10	10.5	5.40 - 12.9		55
THALLIUM	mg/L	FIL	0/10	0/10	-		.00100 - .0100	ND
THALLIUM	mg/L	UNF	0/11	0/11	-		.00100 - .0100	ND
VANADIUM	mg/L	UNF	2/11	1/11	-	.00400 - .0185	.003 - .0136	0.0117
VANADIUM	mg/L	FIL	0/10	0/10	-		.00400 - .0116	0.0234
ZINC	mg/L	UNF	8/11	1/11	0.01	.00740 - .0801	.00500 - .0139	0.0210
ZINC	mg/L	FIL	8/10	0/10	0.007	.00510 - .0270	.00500 - .00500	0.0568
1,1,1-TRICHLOROETHANE	ug/L	UNF	3/13	3/13	-	1.00 - 5.00	2.00 - 10.0	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
1,1-DICHLOROETHANE	ug/L	UNF	1/13	1/13	-	9.00 - 9.00	5.00 - 10.0	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	1/13	1/13	-	5.00 - 5.00	5.00 - 10.0	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
2-BUTANONE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2-HEXANONE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
ACETONE	ug/L	UNF	3/13	3/13	-	3.00 - 5.00	10.0 - 10.0	NA
BENZENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
BROMOFORM	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
BROMOMETHANE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA

000267

TABLE E.2-13
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBON DISULFIDE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
CHLOROBENZENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
CHLOROETHANE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
CHLOROFORM	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
CHLOROMETHANE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
ETHYLBENZENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
METHYLENE CHLORIDE	ug/L	UNF	0/13	0/13	-		5.00 - 16.0	NA
STYRENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
TETRACHLOROETHENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
TOLUENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
TRICHLOROETHENE	ug/L	UNF	1/13	1/13	-	7.00 - 7.00	5.00 - 10.0	NA
VINYL ACETATE	ug/L	UNF	0/10	0/10	-		10.0 - 10.0	NA
VINYL CHLORIDE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
XYLENES, TOTAL	ug/L	UNF	0/13	0/13	-		5.00 - 10.0	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2,4-DINITROPHENOL	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/3	0/3	-		10.0 - 10.0	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/4	0/4	-		10.0 - 10.0	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2-CHLOROPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2-METHYLPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
2-NITROANILINE	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
2-NITROPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/13	0/13	-		10.0 - 20.0	NA
3-NITROANILINE	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
4-METHYLPHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
4-NITROANILINE	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
4-NITROPHENOL	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
ACENAPHTHENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
ACENAPHTHYLENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
ANTHRACENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BENZO(A)PYRENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA

TABLE E.2-13
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZO(K)FLUORANTHENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BENZOIC ACID	ug/L	UNF	0/13	0/13	-		50.0 - 50.0	NA
BENZYL ALCOHOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	3/13	3/13	-	2.00 - 6.00	10.0 - 10.0	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	3/13	3/13	-	1.00 - 2.00	10.0 - 10.0	NA
CARBAZOLE	ug/L	UNF	0/11	0/11	-		10.0 - 10.0	NA
CHRYSENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	2/13	2/13	-	4.00 - 5.00	10.0 - 10.0	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
DIBENZOFURAN	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
DIETHYL PHTHALATE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
FLUORANTHENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
FLUORENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
HEXACHLOROBENZENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
HEXACHLOROETHANE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
ISOPHORONE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/3	0/3	-		10.0 - 10.0	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
NAPHTHALENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
NITROBENZENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
P-CHLOROANILINE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
PENTACHLOROPHENOL	ug/L	UNF	0/13	0/13	-		25.0 - 50.0	NA
PHENANTHRENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
PHENOL	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
PYRENE	ug/L	UNF	0/13	0/13	-		10.0 - 10.0	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	0/3	0/3	-		10.0 - 10.0	NA
4,4'-DDD	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
4,4'-DDE	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
4,4'-DDT	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
ALDRIN	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
ALPHA-BHC	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
ALPHA-CHLORDANE	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
AROCLOR-1016	ug/L	UNF	0/12	0/12	-		.500 - 1.00	NA
AROCLOR-1221	ug/L	UNF	0/12	0/12	-		.500 - 2.00	NA
AROCLOR-1232	ug/L	UNF	0/12	0/12	-		.500 - 1.00	NA
AROCLOR-1242	ug/L	UNF	0/12	0/12	-		.500 - 1.00	NA
AROCLOR-1248	ug/L	UNF	0/12	0/12	-		.500 - 1.00	NA
AROCLOR-1254	ug/L	UNF	0/12	0/12	-		1.00 - 1.00	NA
AROCLOR-1260	ug/L	UNF	0/12	0/12	-		1.00 - 1.00	NA
BETA-BHC	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
DELTA-BHC	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
DIELDRIN	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
ENDOSULFAN II	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/12	0/12	-		.100 - .100	NA

000269

TABLE E.2-13
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ENDOSULFAN-I	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
ENDRIN	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/11	0/11	-		.100 - .100	NA
ENDRIN KETONE	ug/L	UNF	0/12	0/12	-		.100 - .100	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
GAMMA-CHLORDANE	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
HEPTACHLOR	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/12	0/12	-		.0500 - .0500	NA
METHOXYCHLOR	ug/L	UNF	0/12	0/12	-		.0500 - .500	NA
TOXAPHENE	ug/L	UNF	0/12	0/12	-		1.00 - 5.00	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/1	0/1	-		500 - 500	NA
2,4-D	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/2	0/2	-		.500 - 2.50	NA
DEMETON	ug/L	UNF	0/2	0/2	-		.250 - .400	NA
DIAZINON	ug/L	UNF	0/2	0/2	-		.200 - .250	NA
DISULFOTON	ug/L	UNF	0/2	0/2	-		.200 - .250	NA
ETHION	ug/L	UNF	0/2	0/2	-		.200 - .250	NA
MALATHION	ug/L	UNF	0/2	0/2	-		.200 - .250	NA
METHYL PARATHION	ug/L	UNF	0/2	0/2	-		.200 - .250	NA
PARATHION	ug/L	UNF	0/2	0/2	-		.200 - .250	NA
ALKALINITY AS CACO3	mg/L	UNF	11/11	11/11	350	245 - 455		NA
AMMONIA	mg/L	UNF	1/11	0/11	-	.120 - .120	.100 - .300	4.20
BICARBONATE ALKALINITY	mg/L	UNF	5/5	5/5	427	350 - 500		NA
CARBONATE ALKALINITY	mg/L	UNF	0/5	0/5	-		3.00 - 30.0	NA
CHEMICAL OXYGEN DEMAND	mg/L	UNF	0/1	0/1	-		10.0 - 10.0	NA
CHLORIDE	mg/L	UNF	11/12	0/12	18	4.62 - 29.1	5.70 - 5.70	73
FLUORIDE	mg/L	UNF	12/12	0/12	0.15	.090 - .510		0.890
HEXAVALENT CHROMIUM	mg/L	UNF	0/1	0/1	-		.00500 - .00500	NA
NITRATE	mg/L	UNF	14/15	0/15	1.43	.260 - 2.29		11.4
NITRATE, AS NITROGEN	mg/L	UNF	4/4	4/4	1.54	.790 - 2.32		NA
NITRATE/NITRITE	mg/L	UNF	4/4	0/4	1.74	1.15 - 2.54		4.10
PH		UNF	6/6	6/6	7.39	7.33 - 7.90		NA
PHENOLS	mg/L	UNF	1/12	0/12	-	.00500 - .00500	.0100 - .0100	0.0300
PHOSPHORUS	mg/L	UNF	10/12	10/12	0.06	.040 - .980	.020 - .020	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	6/6	6/6	825	583 - 910		NA
SULFATE	mg/L	UNF	12/12	0/12	67.2	26.0 - 95.4		197
SULFIDE	mg/L	UNF	0/11	0/11	-		.0500 - .500	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	4/4	0/4	443	320 - 670		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	12/12	0/12	0.15	.100 - 1.20		3.30
TOTAL ORGANIC CARBON	mg/L	UNF	3/11	0/11	-	1.07 - 1.14	1.00 - 1.00	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/12	1/12	-	.070 - .070	.0100 - 10.0	0.0520
TOTAL ORGANIC HALOGENS	mg/L	UNF	1/4	1/4	-	.026 - .026	.0100 - .0100	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	11/12	1/12	0.16	.110 - .900	.100 - .100	0.900
TOTAL SOLIDS	mg/L	UNF	5/5	5/5	521	490 - 703		NA
ALACHLOR	ug/L	UNF	0/1	0/1	-		2000 - 2000	NA
ATRAZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/1	0/1	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
FONOFOS	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
LINURON	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
METOLACHLOR	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/4	0/4	-		1.00 - 1.00	NA

000270
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TABLE E.2-13
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000271

TABLE E.2-14
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	4/4	2/4	0.9	.3 - 3.5		0.9
URANIUM-238	pCi/L	UNF	3/4	2/4	1	.6 - 1.1		0.64
URANIUM, TOTAL	ug/L	FIL	4/4	4/4	3.1	1.1 - 10.8		0.8
URANIUM, TOTAL	ug/L	UNF	4/4	3/4	3	1.1 - 13		1.2
URANIUM-234	pCi/L	FIL	3/4	2/4	1.2	.5 - 3.5	.6 - .6	0.9
URANIUM-234	pCi/L	UNF	3/4	2/4	1.2	.5 - 1.6		0.8
THORIUM-230	pCi/L	FIL	0/4	0/4	-		.2 - .3	0.29
THORIUM-230	pCi/L	UNF	0/4	0/4	-		.2 - .4	0.89
RADIUM-226	pCi/L	FIL	2/4	0/4	0.5	1.1 - 1.6	1 - 1	1.9
RADIUM-226	pCi/L	UNF	0/4	0/4	-		1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/4	0/4	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	0/4	0/4	-		.2 - .2	0.094
THORIUM-232	pCi/L	FIL	2/4	2/4	0.3	.4 - .9	.2 - .4	0.3
THORIUM-232	pCi/L	UNF	2/4	2/4	0.3	.4 - .9	.3 - .3	0.23
THORIUM, TOTAL	ug/L	FIL	1/1	1/1	-	3.648 - 3.648		2.8
THORIUM, TOTAL	ug/L	UNF	2/4	2/4	2.424	3.648 - 8.208	1.8 - 2.4	0.97
RADIUM-228	pCi/L	FIL	0/4	0/4	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/4	0/4	-		3 - 3.2	3.6
THORIUM-228	pCi/L	FIL	0/4	0/4	-		.2 - .3	0.4
THORIUM-228	pCi/L	UNF	0/4	0/4	-		.2 - .3	0.77
NEPTUNIUM-237	pCi/L	UNF	0/4	0/4	-		1 - 2.4	ND
PLUTONIUM-239/240	pCi/L	UNF	0/4	0/4	-		1 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/4	0/4	-		1 - 1	0.048
STRONTIUM-90	pCi/L	UNF	0/4	0/4	-		5 - 5	ND
TECHNETIUM-99	pCi/L	UNF	0/4	0/4	-		30 - 31	ND
RUTHENIUM-106	pCi/L	UNF	0/4	0/4	-		150 - 150	ND
CESIUM-137	pCi/L	UNF	0/4	0/4	-		7.4 - 7.4	ND
GROSS ALPHA	pCi/L	FIL	2/4	2/4	2.4	3.2 - 5.3	2.6 - 3	NA
GROSS ALPHA	pCi/L	UNF	1/4	1/4	-	5.8 - 5.8	2.4 - 4.1	NA
GROSS BETA	pCi/L	FIL	3/4	3/4	4.5	3.2 - 9	3 - 3	NA
GROSS BETA	pCi/L	UNF	3/4	3/4	4.7	3.6 - 9.3	3.8 - 3.8	NA
ALUMINUM	mg/L	FIL	0/4	0/4	-		.014 - .0367	0.175
ALUMINUM	mg/L	UNF	2/4	1/4	0.072	.126 - .993	.024 - .036	0.225
ANTIMONY	mg/L	FIL	0/4	0/4	-		.027 - .045	ND
ANTIMONY	mg/L	UNF	0/4	0/4	-		.027 - .045	ND
ARSENIC	mg/L	FIL	1/4	0/4	-	.0015 - .0015	.001 - .002	0.26
ARSENIC	mg/L	UNF	3/4	0/4	0.002	.0014 - .0024	.002 - .002	0.0294
BARIUM	mg/L	FIL	4/4	0/4	0.0439	.0389 - .0555		0.669
BARIUM	mg/L	UNF	4/4	0/4	0.0477	.038 - .0544		0.768
BERYLLIUM	mg/L	FIL	0/4	0/4	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/4	0/4	-		.001 - .001	ND
CADMIUM	mg/L	FIL	1/4	0/4	-	.0033 - .0033	.002 - .003	0.006
CADMIUM	mg/L	UNF	0/4	0/4	-		.002 - .003	0.0135
CALCIUM	mg/L	FIL	4/4	0/4	87.7	80.8 - 96		136
CALCIUM	mg/L	UNF	4/4	0/4	84.9	79.8 - 93.5		159
CHROMIUM	mg/L	FIL	0/4	0/4	-		.003 - .004	0.03
CHROMIUM	mg/L	UNF	0/4	0/4	-		.003 - .015	0.0211
COBALT	mg/L	FIL	0/4	0/4	-		.005 - .008	ND
COBALT	mg/L	UNF	1/4	0/4	-	.0074 - .0074	.005 - .008	0.0086
COPPER	mg/L	FIL	0/4	0/4	-		.003 - .004	0.083
COPPER	mg/L	UNF	1/4	0/4	-	.0186 - .0186	.003 - .004	0.0354
CYANIDE	mg/L	FIL	0/4	0/4	-		.01 - .02	ND
CYANIDE	mg/L	UNF	0/4	0/4	-		.01 - .02	ND

000272

TABLE E.2-14
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
IRON	mg/L	FIL	3/4	0/4	0.0672	.0225 - .177	.0217 - .0217	4.14
IRON	mg/L	UNF	3/4	0/4	0.857	.454 - 3.14	.0482 - .0482	5.72
LEAD	mg/L	FIL	1/4	0/4	-	.0011 - .0011	.001 - .002	0.009
LEAD	mg/L	UNF	2/4	1/4	0.001	.0014 - .0069	.001 - .002	0.002
MAGNESIUM	mg/L	FIL	4/4	0/4	21.9	19.7 - 23.6		37.8
MAGNESIUM	mg/L	UNF	4/4	0/4	21.2	20.5 - 24.2		38.5
MANGANESE	mg/L	FIL	3/4	0/4	0.0862	.0255 - .341	.001 - .001	0.78
MANGANESE	mg/L	UNF	4/4	1/4	0.227	.0257 - 1.34		0.904
MERCURY	mg/L	FIL	0/4	0/4	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/4	0/4	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/4	0/4	-		.01 - .1	0.025
MOLYBDENUM	mg/L	UNF	0/3	0/3	-		.011 - .025	ND
NICKEL	mg/L	FIL	0/4	0/4	-		.011 - .031	0.023
NICKEL	mg/L	UNF	0/4	0/4	-		.011 - .0326	0.0514
POTASSIUM	mg/L	FIL	3/4	0/4	2.63	2.34 - 3.11	3.18 - 3.18	3.32
POTASSIUM	mg/L	UNF	4/4	4/4	2.98	2.66 - 3.42		1.96
SELENIUM	mg/L	FIL	0/4	0/4	-		.001 - .002	0.004
SELENIUM	mg/L	UNF	1/4	1/4	-	.0015 - .0015	.001 - .002	0.00075
SILICON	mg/L	FIL	4/4	2/4	3.595	3.04 - 3.98		3.46
SILVER	mg/L	FIL	0/4	0/4	-		.003 - .0043	0.0138
SILVER	mg/L	UNF	0/4	0/4	-		.003 - .004	0.0117
SODIUM	mg/L	FIL	4/4	0/4	12	11.6 - 12.4		55
SODIUM	mg/L	UNF	4/4	0/4	11.8	11 - 12.1		47.1
THALLIUM	mg/L	FIL	0/4	0/4	-		.001 - .003	ND
THALLIUM	mg/L	UNF	0/4	0/4	-		.001 - .01	ND
VANADIUM	mg/L	FIL	0/4	0/4	-		.004 - .007	0.0234
VANADIUM	mg/L	UNF	0/4	0/4	-		.004 - .007	0.0117
ZINC	mg/L	FIL	2/4	0/4	0.00685	.0122 - .0186	.002 - .003	0.0568
ZINC	mg/L	UNF	2/4	0/4	0.00885	.0082 - .014	.0091 - .019	0.021
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/4	0/4	-		10 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
2-BUTANONE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
2-HEXANONE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
ACETONE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
BENZENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
BROMOFORM	ug/L	UNF	0/4	0/4	-		10 - 10	NA
BROMOMETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CARBON DISULFIDE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CHLOROETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CHLOROFORM	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/4	0/4	-		10 - 10	NA

000273

TABLE E.2-14
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ETHYLBENZENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
METHYLENE CHLORIDE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
STYRENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
TETRACHLOROETHENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
TOLUENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
VINYL ACETATE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
VINYL CHLORIDE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/4	0/4	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/1	0/1	-		10 - 10	NA
ENDRIN	ug/L	UNF	0/1	0/1	-		200 - 200	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/1	0/1	-		200 - 200	NA
METHOXYCHLOR	ug/L	UNF	0/1	0/1	-		200 - 200	NA
TOXAPHENE	ug/L	UNF	0/1	0/1	-		500 - 500	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/1	0/1	-		500 - 500	NA
2,4-D	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
ALKALINITY AS CACO3	mg/L	UNF	4/4	4/4	240	220 - 270		NA
AMMONIA	mg/L	UNF	1/4	0/4	-	.069 - .069	.05 - .07	4.2
BICARBONATE ALKALINITY	mg/L	UNF	4/4	4/4	265	230 - 330		NA
CARBONATE ALKALINITY	mg/L	UNF	0/4	0/4	-		3 - 30	NA
CHEMICAL OXYGEN DEMAND	mg/L	UNF	0/1	0/1	-		10 - 10	NA
CHLORIDE	mg/L	UNF	4/4	0/4	18	17 - 21		73
FLUORIDE	mg/L	UNF	4/4	0/4	0.2	.16 - .2		0.89
NITRATE	mg/L	UNF	4/4	0/4	0.84	.36 - 1.9		11.4
NITRATE, AS NITROGEN	mg/L	UNF	1/1	1/1	-	3.26 - 3.26		NA
NITRATE/NITRITE	mg/L	UNF	3/3	0/3	0.53	.34 - 3.39		4.1
NITRITE, AS NITROGEN	mg/L	UNF	1/1	1/1	-	1.5 - 1.5		NA
PH		UNF	4/4	4/4	7.65	7.6 - 8.1		NA
PHENOLS	mg/L	UNF	0/4	0/4	-		.01 - .15	0.03
PHOSPHORUS	mg/L	UNF	2/4	2/4	0.029	.033 - .12	.03 - .05	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	4/4	4/4	610	560 - 640		NA
SULFATE	mg/L	UNF	4/4	0/4	58.5	33 - 64		197
SULFIDE	mg/L	UNF	0/4	0/4	-		.5 - .5	NA
TOTAL DISSOLVED SOLIDS	mg/L	FIL	4/4	0/4	360	330 - 385		658
TOTAL DISSOLVED SOLIDS	mg/L	UNF	1/1	0/1	-	312 - 312		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	2/2	0/2	0.2	.2 - .2		3.3
TOTAL ORGANIC CARBON	mg/L	UNF	1/4	0/4	-	1.2 - 1.2	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	0/4	0/4	-		.01 - .045	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	0/1	0/1	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	1/4	0/4	-	.18 - .18	-.069 - .1	0.9
TOTAL SOLIDS	mg/L	UNF	4/4	4/4	365	340 - 480		NA
ALACHLOR	ug/L	UNF	0/1	0/1	-		2000 - 2000	NA
ATRAZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/1	0/1	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
FONOFOS	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
LINURON	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
METOLACHLOR	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA

000274

TABLE E.2-14
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

TABLE E.2-15
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	0/1	0/1	-		.3 - .3	0.9
URANIUM-238	pCi/L	UNF	0/1	0/1	-		.5 - .5	0.64
URANIUM, TOTAL	ug/L	FIL	1/1	0/1	-	.6 - .6		0.8
URANIUM, TOTAL	ug/L	UNF	1/1	0/1	-	.5 - .5		1.2
URANIUM-234	pCi/L	FIL	1/1	0/1	-	.6 - .6		0.9
URANIUM-234	pCi/L	UNF	1/1	0/1	-	.5 - .5		0.8
THORIUM-230	pCi/L	FIL	0/1	0/1	-		.3 - .3	0.29
THORIUM-230	pCi/L	UNF	1/1	0/1	-	.3 - .3		0.89
RADIUM-226	pCi/L	FIL	0/1	0/1	-		1 - 1	1.9
RADIUM-226	pCi/L	UNF	0/1	0/1	-		1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/1	0/1	-		.2 - .2	ND
URANIUM-235/236	pCi/L	UNF	0/1	0/1	-		.2 - .2	0.094
THORIUM-232	pCi/L	FIL	0/1	0/1	-		.2 - .2	0.3
THORIUM-232	pCi/L	UNF	0/1	0/1	-		.2 - .2	0.23
THORIUM, TOTAL	ug/L	UNF	1/1	1/1	-	1.824 - 1.824		0.97
RADIUM-228	pCi/L	FIL	0/1	0/1	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/1	0/1	-		3 - 3	3.6
THORIUM-228	pCi/L	FIL	0/1	0/1	-		.3 - .3	0.4
THORIUM-228	pCi/L	UNF	0/1	0/1	-		.2 - .2	0.77
NEPTUNIUM-237	pCi/L	UNF	0/1	0/1	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	UNF	0/1	0/1	-		1 - 1	0.05
PLUTONIUM-238	pCi/L	UNF	0/1	0/1	-		1 - 1	0.048
STRONTIUM-90	pCi/L	UNF	0/1	0/1	-		5 - 5	ND
TECHNETIUM-99	pCi/L	UNF	0/1	0/1	-		30 - 30	ND
RUTHENIUM-106	pCi/L	UNF	0/1	0/1	-		150 - 150	ND
CESIUM-137	pCi/L	UNF	0/1	0/1	-		7.4 - 7.4	ND
GROSS ALPHA	pCi/L	FIL	0/1	0/1	-		2.6 - 2.6	NA
GROSS ALPHA	pCi/L	UNF	0/1	0/1	-		2 - 2	NA
GROSS BETA	pCi/L	FIL	0/1	0/1	-		2.1 - 2.1	NA
GROSS BETA	pCi/L	UNF	1/1	1/1	-	7.6 - 7.6		NA
ALUMINUM	mg/L	FIL	0/1	0/1	-		.036 - .036	0.175
ALUMINUM	mg/L	UNF	0/1	0/1	-		.0306 - .0306	0.225
ANTIMONY	mg/L	FIL	0/1	0/1	-		.031 - .031	ND
ANTIMONY	mg/L	UNF	0/1	0/1	-		.027 - .027	ND
ARSENIC	mg/L	FIL	0/1	0/1	-		.002 - .002	0.26
ARSENIC	mg/L	UNF	1/1	0/1	-	.0029 - .0029		0.0294
BARIUM	mg/L	FIL	1/1	0/1	-	.032 - .032		0.669
BARIUM	mg/L	UNF	1/1	0/1	-	.0283 - .0283		0.768
BERYLLIUM	mg/L	FIL	0/1	0/1	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/1	0/1	-		.001 - .001	ND
CADMIUM	mg/L	FIL	0/1	0/1	-		.002 - .002	0.006
CADMIUM	mg/L	UNF	0/1	0/1	-		.002 - .002	0.0135
CALCIUM	mg/L	FIL	1/1	0/1	-	111 - 111		136
CALCIUM	mg/L	UNF	1/1	0/1	-	103 - 103		159
CHROMIUM	mg/L	FIL	0/1	0/1	-		.003 - .003	0.03
CHROMIUM	mg/L	UNF	0/1	0/1	-		.004 - .004	0.0211
COBALT	mg/L	FIL	0/1	0/1	-		.008 - .008	ND
COBALT	mg/L	UNF	0/1	0/1	-		.005 - .005	0.0086
COPPER	mg/L	FIL	0/1	0/1	-		.004 - .004	0.083
COPPER	mg/L	UNF	0/1	0/1	-		.003 - .003	0.0354
CYANIDE	mg/L	FIL	0/1	0/1	-		.02 - .02	ND
CYANIDE	mg/L	UNF	0/1	0/1	-		.02 - .02	ND
IRON	mg/L	FIL	1/1	0/1	-	1.04 - 1.04		4.14

TABLE E.2-15
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
IRON	mg/L	UNF	1/1	0/1	-	.97 - .97		5.72
LEAD	mg/L	FIL	0/1	0/1	-		.001 - .001	0.009
LEAD	mg/L	UNF	0/1	0/1	-		.002 - .002	0.002
MAGNESIUM	mg/L	FIL	1/1	0/1	-	26.5 - 26.5		37.8
MAGNESIUM	mg/L	UNF	1/1	0/1	-	25.3 - 25.3		38.5
MANGANESE	mg/L	FIL	1/1	1/1	-	1.11 - 1.11		0.78
MANGANESE	mg/L	UNF	1/1	1/1	-	.939 - .939		0.904
MERCURY	mg/L	FIL	0/1	0/1	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/1	0/1	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/1	0/1	-		.015 - .015	0.025
MOLYBDENUM	mg/L	UNF	0/1	0/1	-		.011 - .011	ND
NICKEL	mg/L	FIL	0/1	0/1	-		.031 - .031	0.023
NICKEL	mg/L	UNF	0/1	0/1	-		.011 - .011	0.0514
POTASSIUM	mg/L	FIL	1/1	0/1	-	1.71 - 1.71		3.32
POTASSIUM	mg/L	UNF	1/1	0/1	-	1.03 - 1.03		1.96
SELENIUM	mg/L	FIL	0/1	0/1	-		.001 - .001	0.004
SELENIUM	mg/L	UNF	0/1	0/1	-		.002 - .002	0.00075
SILVER	mg/L	FIL	0/1	0/1	-		.003 - .003	0.0138
SILVER	mg/L	UNF	0/1	0/1	-		.004 - .004	0.0117
SODIUM	mg/L	FIL	1/1	0/1	-	4.41 - 4.41		55
SODIUM	mg/L	UNF	1/1	0/1	-	3.94 - 3.94		47.1
THALLIUM	mg/L	FIL	0/1	0/1	-		.002 - .002	ND
THALLIUM	mg/L	UNF	0/1	0/1	-		.003 - .003	ND
VANADIUM	mg/L	FIL	0/1	0/1	-		.007 - .007	0.0234
VANADIUM	mg/L	UNF	0/1	0/1	-		.004 - .004	0.0117
ZINC	mg/L	FIL	0/1	0/1	-		.002 - .002	0.0568
ZINC	mg/L	UNF	0/1	0/1	-		.0162 - .0162	0.021
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/1	0/1	-		10 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
2-BUTANONE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
2-HEXANONE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
ACETONE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
BENZENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
BROMOFORM	ug/L	UNF	0/1	0/1	-		10 - 10	NA
BROMOMETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CARBON DISULFIDE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CHLOROETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CHLOROFORM	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
METHYLENE CHLORIDE	ug/L	UNF	0/1	0/1	-		10 - 10	NA

000277

TABLE E.2-15
SUMMARY STATISTICS FOR FEMP SOUTH PLUME A TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
STYRENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
TETRACHLOROETHENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
TOLUENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
VINYL ACETATE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
VINYL CHLORIDE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/1	0/1	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/1	0/1	-		10 - 10	NA
ALKALINITY AS CACO3	mg/L	UNF	1/1	1/1	-	270 - 270		NA
AMMONIA	mg/L	UNF	1/1	0/1	-	.26 - .26		4.2
BICARBONATE ALKALINITY	mg/L	UNF	1/1	1/1	-	299 - 299		NA
CARBONATE ALKALINITY	mg/L	UNF	0/1	0/1	-		30 - 30	NA
CHLORIDE	mg/L	UNF	1/1	0/1	-	11 - 11		73
FLUORIDE	mg/L	UNF	0/1	0/1	-		.15 - .15	0.89
NITRATE	mg/L	UNF	0/1	0/1	-			11.4
NITRATE, AS NITROGEN	mg/L	UNF	1/1	1/1	-	.05 - .05		NA
NITRATE/NITRITE	mg/L	UNF	0/1	0/1	-		.05 - .05	4.1
PH		UNF	1/1	1/1	-	7.9 - 7.9		NA
PHENOLS	mg/L	UNF	0/1	0/1	-		.15 - .15	0.03
PHOSPHORUS	mg/L	UNF	0/1	0/1	-		.03 - .03	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	1/1	1/1	-	645 - 645		NA
SULFATE	mg/L	UNF	1/1	0/1	-	88 - 88		197
TOTAL DISSOLVED SOLIDS	mg/L	UNF	1/1	0/1	-	368 - 368		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	1/1	0/1	-	.172 - .172		3.3
TOTAL ORGANIC CARBON	mg/L	UNF	0/1	0/1	-		1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	0/1	0/1	-		.045 - .045	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	0/1	0/1	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	0/1	0/1	-		-.26 - -.26	0.9
TOTAL SOLIDS	mg/L	UNF	1/1	1/1	-	498 - 498		NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000278
6161

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	32/40	21/40	2.7	.3 - 84.8	.2 - 1	0.9
URANIUM-238	pCi/L	UNF	30/42	25/42	1.8	.4 - 111	.2 - .5	0.64
URANIUM, TOTAL	ug/L	FIL	40/41	34/41	5.6	.2 - 350	1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	50/51	43/51	8	.2 - 332	.1 - .1	1.2
URANIUM-234	pCi/L	FIL	31/40	22/40	2.6	.4 - 84.4	.2 - 1	0.9
URANIUM-234	pCi/L	UNF	32/42	24/42	2	.3 - 110	.4 - .4	0.8
THORIUM-230	pCi/L	FIL	5/39	5/39	-	.3 - 1.62	.2 - 1	0.29
THORIUM-230	pCi/L	UNF	20/43	4/43	-	.281 - 1.8	.2 - 1	0.89
RADIUM-226	pCi/L	FIL	4/40	0/40	-	1.1 - 1.5	.6 - 1	1.9
RADIUM-226	pCi/L	UNF	10/43	0/43	-	1.1 - 14.9	.6 - 2	105
URANIUM-235/236	pCi/L	FIL	13/40	13/40	-	.5 - 8	.1 - 1	ND
URANIUM-235/236	pCi/L	UNF	15/42	15/42	-	.22 - 5.54	.1 - 1	0.094
THORIUM-232	pCi/L	FIL	5/39	5/39	-	.3 - 2.7	.2 - 1	0.3
THORIUM-232	pCi/L	UNF	4/43	4/43	-	.3 - 2.7	.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	9/22	2/22	-	.912 - 7.296	.92 - 13	2.8
THORIUM, TOTAL	ug/L	UNF	9/31	6/31	-	.912 - 24.6242	.5 - 9.1	0.97
RADIUM-228	pCi/L	FIL	0/40	0/40	-		1.3 - 3	ND
RADIUM-228	pCi/L	UNF	4/43	2/43	-	3.1 - 4.4	1.2 - 3.3	3.6
THORIUM-228	pCi/L	FIL	4/39	2/39	-	.3 - 2.55	.1 - 1	0.4
THORIUM-228	pCi/L	UNF	6/43	2/43	-	.3 - 1.7	.1 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	1/16	1/16	-	2.5 - 2.5	.5 - 1.1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/28	0/28	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/23	0/23	-		.5 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	1/36	1/36	-	1.4 - 1.4	.5 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/23	0/23	-		.5 - 1	ND
PLUTONIUM-238	pCi/L	UNF	0/36	0/36	-		.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	2/23	2/23	-	1.4 - 5.69	.5 - 6.98	ND
STRONTIUM-90	pCi/L	UNF	2/36	2/36	-	1.4 - 17.4	.5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	4/25	4/25	-	19.2 - 24.6	12 - 30	ND
TECHNETIUM-99	pCi/L	UNF	4/36	4/36	-	17.8 - 24.1	13.5 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/17	0/17	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/29	0/29	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/23	0/23	-		4 - 20	ND
CESIUM-137	pCi/L	UNF	0/36	0/36	-		4 - 20	ND
GROSS ALPHA	pCi/L	FIL	24/39	24/39	6.4	2.3 - 420	.7 - 9.4	NA
GROSS ALPHA	pCi/L	UNF	29/42	29/42	11.7	1.9 - 196	3.1 - 620	NA
GROSS BETA	pCi/L	FIL	35/39	35/39	10.7	.6 - 268	2.6 - 5.7	NA
GROSS BETA	pCi/L	UNF	37/42	37/42	14.9	5.4 - 744	5.2 - 6	NA
RADIUM, TOTAL	pCi/L	UNF	4/4	4/4	1	1 - 2.36		NA
URANIUM-235	pCi/L	UNF	2/2	2/2	2.01	.027 - 4		NA
URANIUM-236	pCi/L	UNF	1/2	1/2	0.5	1 - 1	.001 - .001	NA
ALUMINUM	mg/L	FIL	7/40	1/40	-	.0161 - 1.07	0 - .258	0.175
ALUMINUM	mg/L	UNF	29/38	16/38	0.126	.025 - 92	.014 - .5	0.225
ANTIMONY	mg/L	FIL	0/39	0/39	-			
ANTIMONY	mg/L	UNF	0/38	0/38	-		.0011 - .045	ND
ARSENIC	mg/L	FIL	5/40	0/40	-	.0023 - .0439	.001 - .006	0.26
ARSENIC	mg/L	UNF	13/39	6/39	-	.001 - .35	.001 - .006	0.0294
BARIUM	mg/L	FIL	39/40	0/40	0.0456	.0203 - .111	.003 - .003	0.669
BARIUM	mg/L	UNF	36/39	1/39	0.0591	.0246 - 8.69	.2 - .2	0.768
BERYLLIUM	mg/L	FIL	0/39	0/39	-		.001 - .005	0.0022
BERYLLIUM	mg/L	UNF	1/38	1/38	-	.0015 - .0015	.001 - .01	ND
CADMIUM	mg/L	FIL	3/40	1/40	-	.003 - .0138	.002 - .005	0.006
CADMIUM	mg/L	UNF	2/39	0/39	-	.0038 - .0053	.001 - .0104	0.0135

000279

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	FIL	40/40	5/40	99	77.4 - 210		
CALCIUM	mg/L	UNF	39/39	5/39	108	73.6 - 411		159
CHROMIUM	mg/L	FIL	5/40	4/40	-	.019 - .208	.004 - .01	0.03
CHROMIUM	mg/L	UNF	11/40	5/40	-	.0048 - 1.11	.004 - .0292	0.0211
COBALT	mg/L	FIL	0/39	0/39	-		.003 - .0219	ND
COBALT	mg/L	UNF	7/38	3/38	-	.005 - .168	.003 - .025	0.0086
COPPER	mg/L	FIL	4/40	0/40	-	.0048 - .0544	.002 - .0164	0.083
COPPER	mg/L	UNF	11/39	4/39	-	.0044 - .694	.002 - .124	0.0354
CYANIDE	mg/L	FIL	2/33	2/33	-	.023 - .055	0 - .02	ND
CYANIDE	mg/L	UNF	0/39	0/39	-		.001 - .0467	ND
IRON	mg/L	FIL	19/40	0/40	-	.006 - 1.98	.005 - .151	4.14
IRON	mg/L	UNF	33/39	12/39	0.657	.055 - 913	.0226 - .587	5.72
LEAD	mg/L	FIL	9/40	1/40	-	.0012 - .0132	.001 - .002	0.009
LEAD	mg/L	UNF	16/39	10/39	-	.0012 - .244	.001 - .0444	0.002
MAGNESIUM	mg/L	FIL	40/40	5/40	25.9	18.2 - 71.7		
MAGNESIUM	mg/L	UNF	39/39	10/39	29.1	17.9 - 507		38.5
MANGANESE	mg/L	FIL	25/40	0/40	0.011	.0014 - .463	.001 - .0148	0.78
MANGANESE	mg/L	UNF	34/39	5/39	0.127	.0013 - 139	.001 - .02	0.904
MERCURY	mg/L	FIL	0/40	0/40	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	2/39	2/39	-	.0004 - .0006	.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	2/31	1/31	-	.0217 - .049	.0063 - .1	0.025
MOLYBDENUM	mg/L	UNF	3/18	3/18	-	.01 - .0124	.003 - .025	ND
NICKEL	mg/L	FIL	4/40	3/40	-	.0205 - .0554	.003 - .031	0.023
NICKEL	mg/L	UNF	8/39	3/39	-	.0115 - .621	.003 - .031	0.0514
POTASSIUM	mg/L	FIL	38/40	5/40	2.54	1.09 - 120	2.76 - 3.05	3.32
POTASSIUM	mg/L	UNF	36/39	33/39	3.18	.724 - 140	1.89 - 2.02	1.96
SELENIUM	mg/L	FIL	3/40	0/40	-	.0012 - .0019	.001 - .003	0.004
SELENIUM	mg/L	UNF	6/39	6/39	-	.001 - .0022	.001 - .01	0.00075
SILICON	mg/L	FIL	27/28	19/28	4.4	2 - 5.83	3.7 - 3.7	3.46
SILICON	mg/L	UNF	6/6	1/6	4.88	3.07 - 5.99		5.81
SILVER	mg/L	FIL	3/40	1/40	-	.0051 - .12	.002 - .01	0.0138
SILVER	mg/L	UNF	1/39	0/39	-	.0031 - .0031	.001 - .03	0.0117
SODIUM	mg/L	FIL	40/40	1/40	13.4	9.4 - 66		
SODIUM	mg/L	UNF	39/39	3/39	13.8	9.67 - 130		47.1
THALLIUM	mg/L	FIL	0/39	0/39	-			55
THALLIUM	mg/L	UNF	0/38	0/38	-		.001 - .01	ND
TIN	mg/L	FIL	0/1	0/1	-		1 - 1	NA
TIN	mg/L	UNF	0/1	0/1	-		1 - 1	NA
VANADIUM	mg/L	FIL	5/40	1/40	-	.0041 - .0823	.003 - .0103	0.0234
VANADIUM	mg/L	UNF	9/38	5/38	-	.005 - .251	.003 - .05	0.0117
ZINC	mg/L	FIL	10/40	1/40	-	.0042 - .0976	.003 - .0524	0.0568
ZINC	mg/L	UNF	14/39	10/39	-	.0069 - 1.12	.005 - .232	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/3	0/3	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	3/40	3/40	-	6 - 550	1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	1/40	1/40	-	58 - 58	1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	1/40	1/40	-	110 - 110	1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	1/40	1/40	-	310 - 310	1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	1/40	1/40	-	4 - 4	1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	0/40	0/40	-		2 - 10	NA
2-HEXANONE	ug/L	UNF	0/40	0/40	-		2 - 10	NA

000280

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-METHYL-2-PENTANONE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
ACETONE	ug/L	UNF	4/40	4/40	-	1 - 24.8	2 - 10	NA
BENZENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
BROMOFORM	ug/L	UNF	0/40	0/40	-		1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
CHLOROFORM	ug/L	UNF	1/40	1/40	-	29 - 29	1 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/39	0/39	-		1 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/1	0/1	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	0/40	0/40	-		1 - 12	NA
STYRENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/1	0/1	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	1/40	1/40	-	3 - 3	1 - 10	NA
TOLUENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	1/40	1/40	-	34 - 34	1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/5	0/5	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/20	0/20	-		2 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/40	0/40	-		1 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/40	0/40	-		1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/17	0/17	-		2 - 11	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/20	0/20	-		1 - 11	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/20	0/20	-		1 - 11	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 50	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
2,4-DINITROPHENOL	ug/L	UNF	0/18	0/18	-		4 - 50	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/18	0/18	-		1 - 15	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/18	0/18	-		1 - 15	NA
2-BENZYL-4-CHLOROPHENOL	ug/L	UNF	0/1	0/1	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/16	0/16	-		10 - 60	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
2-CHLOROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
2-METHYLPHENOL	ug/L	UNF	0/18	0/18	-		1 - 11	NA
2-NITROANILINE	ug/L	UNF	0/18	0/18	-		1 - 50	NA
2-NITROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/16	0/16	-		5 - 20	NA
3-NITROANILINE	ug/L	UNF	0/18	0/18	-		2 - 50	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/18	0/18	-		4 - 50	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/18	0/18	-		2 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/18	0/18	-		1 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/17	0/17	-		1 - 11	NA

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-NITROANILINE	ug/L	UNF	0/18	0/18	-		3 - 50	NA
4-NITROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 50	NA
ACENAPHTHENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
ACENAPHTHYLENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
ANTHRACENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
BENZO(A)PYRENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/18	0/18	-		4 - 11	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
BENZOIC ACID	ug/L	UNF	0/12	0/12	-		20 - 50	NA
BENZYL ALCOHOL	ug/L	UNF	0/13	0/13	-		2 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/18	0/18	-		2 - 20	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/18	0/18	-		2 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/18	0/18	-		2 - 20	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	2/18	2/18	-	.8 - 5	4 - 11	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	1/18	1/18	-	2 - 2	4 - 11	NA
CARBAZOLE	ug/L	UNF	0/10	0/10	-		5 - 11	NA
CHRYSENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
CUMENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	3/18	3/18	-	2 - 52	2 - 10	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
DIBENZOFURAN	ug/L	UNF	0/18	0/18	-		1 - 11	NA
DIETHYL PHTHALATE	ug/L	UNF	0/18	0/18	-		1 - 11	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
FLUORANTHENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
FLUORENE	ug/L	UNF	0/18	0/18	-		1 - 11	NA
HEXACHLOROBENZENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
HEXACHLOROETHANE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/18	0/18	-		4 - 11	NA
ISOPHORONE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/2	0/2	-		4 - 10	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
NAPHTHALENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
NITROBENZENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
P-CHLOROANILINE	ug/L	UNF	0/18	0/18	-		2 - 20	NA
PENTACHLOROPHENOL	ug/L	UNF	0/18	0/18	-		2 - 50	NA
PHENANTHRENE	ug/L	UNF	0/18	0/18	-		1 - 11	NA
PHENOL	ug/L	UNF	0/18	0/18	-		2 - 11	NA
PYRENE	ug/L	UNF	0/18	0/18	-		2 - 11	NA
PYRIDINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
TRIBUTYL PHOSPHATE	ug/L	UNF	0/1	0/1	-		10 - 10	NA
4,4'-DDD	ug/L	UNF	0/17	0/17	-		.01 - 4	NA
4,4'-DDE	ug/L	UNF	0/17	0/17	-		.01 - 4	NA
4,4'-DDT	ug/L	UNF	0/17	0/17	-		.01 - 4	NA
ALDRIN	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
ALPHA-BHC	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
ALPHA-CHLORDANE	ug/L	UNF	0/16	0/16	-		.05 - .5	NA
AROCLOR-1016	ug/L	UNF	0/17	0/17	-		.05 - 1	NA

000282

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
AROCLOR-1221	ug/L	UNF	0/17	0/17	-		.05 - 2.1	NA
AROCLOR-1232	ug/L	UNF	0/17	0/17	-		.05 - 1	NA
AROCLOR-1242	ug/L	UNF	0/17	0/17	-		.05 - 1	NA
AROCLOR-1248	ug/L	UNF	0/17	0/17	-		.05 - 1	NA
AROCLOR-1254	ug/L	UNF	0/17	0/17	-		.1 - 1	NA
AROCLOR-1260	ug/L	UNF	0/17	0/17	-		.1 - 1	NA
BETA-BHC	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
CHLORDANE	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
CHLOROBENZILATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
DIELDRIN	ug/L	UNF	0/17	0/17	-		.01 - .2	NA
ENDOSULFAN II	ug/L	UNF	0/17	0/17	-		.01 - .2	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/17	0/17	-		.01 - .2	NA
ENDOSULFAN-I	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
ENDRIN	ug/L	UNF	0/19	0/19	-		.01 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/11	0/11	-		.1 - .2	NA
ENDRIN KETONE	ug/L	UNF	0/16	0/16	-		.01 - .1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/19	0/19	-		.005 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/16	0/16	-		.05 - .5	NA
HEPTACHLOR	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/17	0/17	-		.005 - .2	NA
METHOXYCHLOR	ug/L	UNF	0/19	0/19	-		.05 - 200	NA
SULFOTEP	ug/L	UNF	0/1	0/1	-		15 - 15	NA
TOXAPHENE	ug/L	UNF	0/19	0/19	-		.1 - 500	NA
2,4,5-T	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/4	0/4	-		.5 - 500	NA
2,4-D	ug/L	UNF	0/4	0/4	-		1 - 1000	NA
AZINPHOSMETHYL	ug/L	UNF	0/3	0/3	-		2.5 - 2.5	NA
DEMETON	ug/L	UNF	0/3	0/3	-		.25 - .25	NA
DIAZINON	ug/L	UNF	0/3	0/3	-		.25 - .25	NA
DIMETHOATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DISULFOTON	ug/L	UNF	0/4	0/4	-		.25 - 15	NA
ETHION	ug/L	UNF	0/3	0/3	-		.25 - .25	NA
FAMPHUR	ug/L	UNF	0/1	0/1	-		15 - 15	NA
MALATHION	ug/L	UNF	0/3	0/3	-		.25 - .25	NA
METHYL PARATHION	ug/L	UNF	0/4	0/4	-		.25 - 15	NA
PARATHION	ug/L	UNF	0/4	0/4	-		.25 - 15	NA
PHORATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
THIONAZIN	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-DIOXANE	ug/L	UNF	0/1	0/1	-		5000 - 5000	NA
ALKALINITY AS CACO3	mg/L	UNF	40/40	40/40	280	192 - 453		NA
ALLYL CHLORIDE	mg/L	UNF	0/3	0/3	-		5 - 20	NA
AMMONIA	mg/L	UNF	11/40	0/40	-	.02 - .34	.02 - .15	4.2
BICARBONATE	mg/L	UNF	5/5	5/5	216	15 - 373		NA
BICARBONATE ALKALINITY	mg/L	UNF	33/33	33/33	340	240 - 506		NA
CARBONATE ALKALINITY	mg/L	UNF	1/34	1/34	-	2 - 2	1 - 30	NA
CHEMICAL OXYGEN DEMAND	mg/L	UNF	4/7	4/7	11	11 - 34	5 - 10	NA
CHLORIDE	mg/L	UNF	39/40	0/40	23.4	3 - 64	17.8 - 17.8	73
FLUORIDE	mg/L	UNF	35/40	0/40	0.21	.1 - .7	.1 - .28	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	0/5	0/5	-		.005 - .02	NA
NITRATE	mg/L	UNF	28/32	0/32	1.65	.08 - 7.91	.049 - .257	11.4
NITRATE, AS NITROGEN	mg/L	UNF	16/17	16/17	2.04	.06 - 8.98	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	28/32	1/32	1.6	.04 - 5.1	.02 - .05	4.1

000283

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
NITRITE, AS NITROGEN	mg/L	UNF	2/5	2/5	-	1.74 - 3	.02 - .02	NA
PH		UNF	34/35	34/35	7.43	7 - 7.9	7.33 - 7.33	NA
PHENOLS	mg/L	UNF	2/40	0/40	-	.015 - .023	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	2/2	2/2	0.155	.01 - .3		NA
PHOSPHORUS	mg/L	UNF	29/41	29/41	0.12	.04 - 170	.02 - .306	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	35/35	35/35	700	424 - 1170		NA
SULFATE	mg/L	UNF	38/39	1/39	71	18.6 - 237.5	218 - 218	197
SULFIDE	mg/L	UNF	1/33	1/33	-	11 - 11	.2 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	17/17	2/17	443	298 - 750		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	22/35	0/35	0.16	.12 - 3.21	.1 - .17	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	22/39	4/39	-	1 - 16	.632 - 10	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	7/39	4/39	-	.0144 - .11	.01 - 10	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	3/19	3/19	-	.013 - .053	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	23/40	3/40	0.165	.13 - 3.15	-.058 - .2	0.9
TOTAL SOLIDS	mg/L	UNF	29/29	29/29	538	332 - 2560		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/3	0/3	-		1 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/3	0/3	-		2 - 20	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/3	0/3	-		2 - 20	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-PICOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
4-AMINOBIPHENYL	ug/L	UNF	0/1	0/1	-		15 - 15	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACETONITRILE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACROLEIN	ug/L	UNF	0/7	0/7	-		20 - 50	NA
ACROLEIN	ug/L	UNF	0/7	0/7	-		20 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/7	0/7	-		20 - 50	NA
ALACHLOR	ug/L	UNF	0/3	0/3	-		2000 - 2000	NA
ANILINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ARAMITE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ATRAZINE	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/3	0/3	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
DIALLATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/3	0/3	-		1 - 10	NA
DINOSEB	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DIPHENYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA

TABLE E.2-16
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ETHYL CYANIDE	ug/L	UNF	0/3	0/3	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
FONOFOS	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
HEXACHLOROPHENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
HEXACHLOROPROPENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
IODOMETHANE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
ISODRIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ISOSAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
KEPONE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
LINURON	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
METHACRYLONITRILE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
METHAPYRILENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METHYL METHACRYLATE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
METHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METOLACHLOR	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
PENTACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PENTACHLOROETHANE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PHENACETIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
POTASSIUM-40	ug/L	UNF	0/1	0/1	-		90 - 90	NA
PRONAMIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
SAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
SIMIZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TERBUFOS	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/17	0/17	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/2	0/2	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000285

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	21/30	8/30	-	.3 - 29.5	.1 - .5	0.9
URANIUM-238	pCi/L	UNF	19/30	14/30	-	.3 - 25.3	.1 - .6	0.64
URANIUM, TOTAL	ug/L	FIL	29/30	13/30	-	.3 - 104	.1 - .1	0.8
URANIUM, TOTAL	ug/L	UNF	45/45	26/45	1.7	.2 - 110		1.2
URANIUM-234	pCi/L	FIL	20/30	11/30	-	.4 - 28.7	.1 - .5	0.9
URANIUM-234	pCi/L	UNF	24/30	14/30	-	.3 - 24.3	.2 - .7	0.8
THORIUM-230	pCi/L	FIL	8/30	8/30	-	.3 - .6	.2 - .4	0.29
THORIUM-230	pCi/L	UNF	10/30	1/30	-	.3 - .9	.2 - 1	0.89
RADIUM-226	pCi/L	FIL	4/30	1/30	-	1.3 - 2.1	.6 - 1.1	1.9
RADIUM-226	pCi/L	UNF	2/30	0/30	-	2.6 - 4.7	.5 - 1.1	105
URANIUM-235/236	pCi/L	FIL	3/30	3/30	-	.9 - 1.4	.1 - .9	ND
URANIUM-235/236	pCi/L	UNF	4/30	4/30	-	.3 - 1.09	.1 - 1	0.094
THORIUM-232	pCi/L	FIL	4/30	4/30	-	.4 - .8	.2 - .4	0.3
THORIUM-232	pCi/L	UNF	2/30	2/30	-	.4 - .8	.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	10/16	3/16	-	.912 - 3.649	1.3 - 6.1	2.8
THORIUM, TOTAL	ug/L	UNF	13/28	12/28	-	.912 - 2000	1.5 - 10	0.97
RADIUM-228	pCi/L	FIL	0/30	0/30	-		1.8 - 3	ND
RADIUM-228	pCi/L	UNF	2/30	0/30	-	3.2 - 3.5	1.6 - 3.3	3.6
THORIUM-228	pCi/L	FIL	5/30	1/30	-	.3 - 8.6	.1 - .3	0.4
THORIUM-228	pCi/L	UNF	0/30	0/30	-		.1 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	1/10	1/10	-	3.25 - 3.25	1 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/18	0/18	-		.5 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/16	0/16	-		1 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	1/26	1/26	-	.6 - .6	.5 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/16	0/16	-		1 - 1	ND
PLUTONIUM-238	pCi/L	UNF	1/26	1/26	-	2.7 - 2.7	.5 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/16	0/16	-		.5 - 5	ND
STRONTIUM-90	pCi/L	UNF	1/26	1/26	-	2.1 - 2.1	.5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	1/17	1/17	-	24.4 - 24.4	12.6 - 30	ND
TECHNETIUM-99	pCi/L	UNF	1/27	1/27	-	24.4 - 24.4	13.1 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/10	0/10	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/20	0/20	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/16	0/16	-		4 - 20	ND
CESIUM-137	pCi/L	UNF	0/24	0/24	-		4 - 20	ND
GROSS ALPHA	pCi/L	FIL	11/30	11/30	-	2.1 - 52.9	1.8 - 5.5	NA
GROSS ALPHA	pCi/L	UNF	16/30	16/30	3.5	1.8 - 30.8	1.2 - 620	NA
GROSS BETA	pCi/L	FIL	20/30	20/30	6	2.8 - 49.6	2.7 - 5.7	NA
GROSS BETA	pCi/L	UNF	20/30	20/30	2	2.5 - 22.8	2.7 - 880	NA
RADIUM, TOTAL	pCi/L	UNF	1/1	1/1	-	1 - 1		NA
URANIUM-235	pCi/L	UNF	1/1	1/1	-	.02 - .02		NA
URANIUM-236	pCi/L	UNF	1/1	1/1	-	.009 - .009		NA
ALUMINUM	mg/L	FIL	3/28	2/28	-	.1 - 1.44	.014 - .238	0.175
ALUMINUM	mg/L	UNF	10/29	4/29	-	.0233 - 1.47	.014 - .5	0.225
ANTIMONY	mg/L	FIL	1/28	1/28	-	.0608 - .0608	.025 - .045	ND
ANTIMONY	mg/L	UNF	1/29	1/29	-	.072 - .072	.025 - .045	ND
ARSENIC	mg/L	FIL	4/28	0/28	-	.0011 - .23	.001 - .006	0.26
ARSENIC	mg/L	UNF	7/29	1/29	-	.0012 - .234	.001 - .006	0.0294
BARIUM	mg/L	FIL	26/28	0/28	0.0567	.0355 - .482	.0297 - .0609	0.669
BARIUM	mg/L	UNF	26/29	0/29	0.0569	.0366 - .494	.0374 - .2	0.768
BERYLLIUM	mg/L	FIL	1/28	1/28	-	.174 - .174	.001 - .01	0.0022
BERYLLIUM	mg/L	UNF	1/29	1/29	-	.178 - .178	.001 - .01	ND
CADMIUM	mg/L	FIL	3/28	1/28	-	.0038 - .203	.002 - .0032	0.006
CADMIUM	mg/L	UNF	3/29	2/29	-	.0043 - .211	.001 - .003	0.0135

000286
6161

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	FIL	29/29	0/29	90.1	72.4 - 116		136
CALCIUM	mg/L	UNF	29/29	0/29	89.8	68 - 119		159
CHROMIUM	mg/L	FIL	2/28	2/28	-	.031 - .397	.004 - .0063	0.03
CHROMIUM	mg/L	UNF	6/29	2/29	-	.0042 - .405	.004 - .0083	0.0211
COBALT	mg/L	FIL	1/28	1/28	-	.516 - .516	.005 - .025	ND
COBALT	mg/L	UNF	2/29	1/29	-	.0052 - .528	.005 - .025	0.0086
COPPER	mg/L	FIL	2/28	1/28	-	.0039 - .186	.003 - .0124	0.083
COPPER	mg/L	UNF	7/29	2/29	-	.0034 - .19	.003 - .025	0.0354
CYANIDE	mg/L	FIL	0/25	0/25	-		0 - .02	ND
CYANIDE	mg/L	UNF	0/28	0/28	-		.005 - .02	ND
IRON	mg/L	FIL	23/28	1/28	1.405	.438 - 4.17	.012 - .0473	4.14
IRON	mg/L	UNF	24/29	1/29	1.75	.0435 - 46.1	.0342 - .868	5.72
LEAD	mg/L	FIL	8/28	1/28	-	.0012 - .3	.001 - .0034	0.009
LEAD	mg/L	UNF	11/29	7/29	-	.0013 - .295	.001 - .005	0.002
MAGNESIUM	mg/L	FIL	29/29	0/29	22	19 - 30.2		37.8
MAGNESIUM	mg/L	UNF	29/29	0/29	22	18.8 - 31.8		38.5
MANGANESE	mg/L	FIL	26/28	0/28	0.257	.0068 - .555	.001 - .001	0.78
MANGANESE	mg/L	UNF	28/29	0/29	0.266	.002 - .619	.0024 - .0024	0.904
MERCURY	mg/L	FIL	1/28	1/28	-	.0052 - .0052	.0002 - .0002	0.0004
MERCURY	mg/L	UNF	1/29	1/29	-	.0049 - .0049	.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/21	0/21	-		.01 - .1	0.025
MOLYBDENUM	mg/L	UNF	0/10	0/10	-		.01 - .025	ND
NICKEL	mg/L	FIL	1/28	1/28	-	.518 - .518	.011 - .031	0.023
NICKEL	mg/L	UNF	2/29	1/29	-	.0239 - .547	.005 - .031	0.0514
POTASSIUM	mg/L	FIL	24/28	0/28	2.37	1.58 - 3.08	1.48 - 2.72	3.32
POTASSIUM	mg/L	UNF	25/29	23/29	2.61	1.64 - 3.9	1.01 - 2.75	1.96
SELENIUM	mg/L	FIL	5/28	1/28	-	.001 - .246	.001 - .002	0.004
SELENIUM	mg/L	UNF	6/29	6/29	-	.0013 - .234	.001 - .0025	0.00075
SILICON	mg/L	FIL	21/21	14/21	4.14	.402 - 5.88		3.46
SILICON	mg/L	UNF	1/1	0/1	-	5.6 - 5.6		5.81
SILVER	mg/L	FIL	4/28	1/28	-	.0051 - .0857	.003 - .007	0.0138
SILVER	mg/L	UNF	1/29	1/29	-	.0799 - .0799	.001 - .007	0.0117
SODIUM	mg/L	FIL	28/28	0/28	11	6.82 - 17.4		55
SODIUM	mg/L	UNF	29/29	0/29	11.4	6.8 - 18.8		47.1
THALLIUM	mg/L	FIL	1/28	1/28	-	.0584 - .0584	.001 - .01	ND
THALLIUM	mg/L	UNF	1/29	1/29	-	.0569 - .0569	.001 - .01	ND
TIN	mg/L	FIL	0/1	0/1	-		1 - 1	NA
TIN	mg/L	UNF	0/1	0/1	-		1 - 1	NA
VANADIUM	mg/L	FIL	2/28	1/28	-	.017 - .282	.003 - .007	0.0234
VANADIUM	mg/L	UNF	1/29	1/29	-	.29 - .29	.003 - .05	0.0117
ZINC	mg/L	FIL	5/28	1/28	-	.0075 - .122	.003 - .0294	0.0568
ZINC	mg/L	UNF	8/29	3/29	-	.0108 - .126	.0046 - .0223	0.021
1,1,1,2-TETRACHLOROETHANE	ug/L	UNF	0/3	0/3	-		1 - 1	NA
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
2-BUTANONE	ug/L	UNF	0/28	0/28	-		2 - 10	NA
2-HEXANONE	ug/L	UNF	0/28	0/28	-		2 - 10	NA

000287

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-METHYL-2-PENTANONE	ug/L	UNF	0/28	0/28	-		2 - 10	NA
ACETONE	ug/L	UNF	1/28	1/28	-	2 - 2	2 - 200	NA
BENZENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
BROMOFORM	ug/L	UNF	0/28	0/28	-		1 - 10	NA
BROMOMETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CARBON DISULFIDE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CHLOROETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CHLOROFORM	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
ISOBUTYL ALCOHOL	ug/L	UNF	0/1	0/1	-		3000 - 3000	NA
METHYLENE CHLORIDE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
STYRENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
T-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/1	0/1	-		20 - 20	NA
TETRACHLOROETHENE	ug/L	UNF	2/28	2/28	-	1 - 1	1 - 10	NA
TOLUENE	ug/L	UNF	2/28	2/28	-	8 - 13	1 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/4	0/4	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/14	0/14	-		2 - 10	NA
VINYL CHLORIDE	ug/L	UNF	0/28	0/28	-		1 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/28	0/28	-		1 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/5	0/5	-		2 - 11	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		1 - 11	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/7	0/7	-		1 - 11	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/6	0/6	-		2 - 27	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
2,4-DINITROPHENOL	ug/L	UNF	0/6	0/6	-		4 - 27	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/6	0/6	-		1 - 15	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/6	0/6	-		1 - 15	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/13	0/13	-		10 - 60	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
2-CHLOROPHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
2-METHYLPHENOL	ug/L	UNF	0/6	0/6	-		1 - 11	NA
2-NITROANILINE	ug/L	UNF	0/6	0/6	-		1 - 27	NA
2-NITROPHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/5	0/5	-		10 - 15	NA
3-NITROANILINE	ug/L	UNF	0/6	0/6	-		2 - 27	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/6	0/6	-		4 - 27	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/6	0/6	-		2 - 15	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/6	0/6	-		1 - 15	NA
4-METHYLPHENOL	ug/L	UNF	0/5	0/5	-		1 - 11	NA
4-NITROANILINE	ug/L	UNF	0/6	0/6	-		3 - 27	NA

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
4-NITROPHENOL	ug/L	UNF	0/6	0/6	-		2 - 27	NA
ACENAPHTHENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
ACENAPHTHYLENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
ANTHRACENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
BENZO(A)PYRENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/6	0/6	-		4 - 11	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
BENZOIC ACID	ug/L	UNF	0/1	0/1	-		20 - 20	NA
BENZYL ALCOHOL	ug/L	UNF	0/2	0/2	-		2 - 40	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/6	0/6	-		2 - 15	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/6	0/6	-		2 - 15	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/6	0/6	-		2 - 11	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	1/6	1/6	-	.9 - .9	1 - 11	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	1/6	1/6	-	1 - 1	4 - 11	NA
CARBAZOLE	ug/L	UNF	0/4	0/4	-		10 - 11	NA
CHRYSENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
CUMENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	1/6	1/6	-	2 - 2	2 - 11	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
DIBENZOFURAN	ug/L	UNF	0/6	0/6	-		1 - 11	NA
DIETHYL PHTHALATE	ug/L	UNF	0/6	0/6	-		1 - 11	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
FLUORANTHENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
FLUORENE	ug/L	UNF	0/6	0/6	-		1 - 11	NA
HEXACHLOROBENZENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
HEXACHLOROETHANE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/6	0/6	-		4 - 11	NA
ISOPHORONE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
N-NITROSODIMETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
NAPHTHALENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
NITROBENZENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
P-CHLOROANILINE	ug/L	UNF	0/7	0/7	-		2 - 11	NA
PENTACHLOROPHENOL	ug/L	UNF	0/7	0/7	-		2 - 27	NA
PHENANTHRENE	ug/L	UNF	0/6	0/6	-		1 - 11	NA
PHENOL	ug/L	UNF	0/6	0/6	-		2 - 11	NA
PYRENE	ug/L	UNF	0/6	0/6	-		2 - 11	NA
PYRIDINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
4,4'-DDD	ug/L	UNF	0/8	0/8	-		.01 - 4	NA
4,4'-DDE	ug/L	UNF	0/8	0/8	-		.01 - 4	NA
4,4'-DDT	ug/L	UNF	0/8	0/8	-		.01 - 4	NA
ALDRIN	ug/L	UNF	0/8	0/8	-		.005 - .2	NA
ALPHA-BHC	ug/L	UNF	0/8	0/8	-		.005 - .2	NA
ALPHA-CHLORDANE	ug/L	UNF	0/7	0/7	-		.05 - .052	NA
AROCLOR-1016	ug/L	UNF	0/8	0/8	-		.05 - 1	NA
AROCLOR-1221	ug/L	UNF	0/8	0/8	-		.05 - 2.1	NA
AROCLOR-1232	ug/L	UNF	0/8	0/8	-		.05 - 1	NA

000289

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
AROCLOR-1242	ug/L	UNF	0/8	0/8	-		.05 - 1	NA
AROCLOR-1248	ug/L	UNF	0/8	0/8	-		.05 - 1	NA
AROCLOR-1254	ug/L	UNF	0/8	0/8	-		.1 - 1	NA
AROCLOR-1260	ug/L	UNF	0/8	0/8	-		.1 - 1	NA
BETA-BHC	ug/L	UNF	0/8	0/8	-		.005 - .2	NA
CHLORDANE	ug/L	UNF	0/1	0/1	-		.2 - .2	NA
CHLOROBENZILATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DELTA-BHC	ug/L	UNF	0/8	0/8	-		.005 - .2	NA
DIELDRIN	ug/L	UNF	1/8	1/8	-	.016 - .016	.01 - .2	NA
ENDOSULFAN II	ug/L	UNF	0/8	0/8	-		.01 - .2	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/8	0/8	-		.01 - .2	NA
ENDOSULFAN-I	ug/L	UNF	1/8	1/8	-	.025 - .025	.005 - .2	NA
ENDRIN	ug/L	UNF	0/11	0/11	-		.01 - 200	NA
ENDRIN ALDEHYDE	ug/L	UNF	0/7	0/7	-		.1 - .2	NA
ENDRIN KETONE	ug/L	UNF	0/7	0/7	-		.01 - .1	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/11	0/11	-		.005 - 200	NA
GAMMA-CHLORDANE	ug/L	UNF	0/7	0/7	-		.05 - .052	NA
HEPTACHLOR	ug/L	UNF	0/8	0/8	-		.005 - .2	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/8	0/8	-		.005 - .2	NA
METHOXYCHLOR	ug/L	UNF	0/11	0/11	-		.05 - 200	NA
SULFOTEP	ug/L	UNF	0/1	0/1	-		15 - 15	NA
TOXAPHENE	ug/L	UNF	0/11	0/11	-		.1 - 500	NA
2,4,5-T	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
2,4,5-TP (SILVEX)	ug/L	UNF	0/4	0/4	-		.5 - 500	NA
2,4-D	ug/L	UNF	0/4	0/4	-		1 - 1000	NA
DIMETHOATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DISULFOTON	ug/L	UNF	0/1	0/1	-		15 - 15	NA
FAMPHUR	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METHYL PARATHION	ug/L	UNF	0/1	0/1	-		15 - 15	NA
PARATHION	ug/L	UNF	0/1	0/1	-		15 - 15	NA
PHORATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
THIONAZIN	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-DIOXANE	ug/L	UNF	0/1	0/1	-		5000 - 5000	NA
ALKALINITY AS CACO3	mg/L	UNF	28/28	28/28	237	210 - 312		NA
ALLYL CHLORIDE	mg/L	UNF	0/3	0/3	-		5 - 20	NA
AMMONIA	mg/L	UNF	15/28	0/28	0.054	.03 - .15	.02 - .17	4.2
BICARBONATE	mg/L	UNF	4/4	4/4	233	217 - 270		NA
BICARBONATE ALKALINITY	mg/L	UNF	26/26	26/26	299	200 - 390		NA
CARBONATE ALKALINITY	mg/L	UNF	0/26	0/26	-		1 - 30	NA
CHEMICAL OXYGEN DEMAND	mg/L	UNF	2/4	2/4	6.5	8 - 15	10 - 10	NA
CHLORIDE	mg/L	UNF	28/28	0/28	23.5	10.74 - 35		73
FLUORIDE	mg/L	UNF	23/28	0/28	0.16	.1 - .4	.1 - .26	0.89
HEXAVALENT CHROMIUM	mg/L	UNF	0/2	0/2	-		.005 - .005	NA
NITRATE	mg/L	UNF	7/21	0/21	-	.17 - 3.13	.02 - .278	11.4
NITRATE, AS NITROGEN	mg/L	UNF	10/14	10/14	0.04	.02 - 3.17	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	11/25	0/25	-	.02 - 2.6	.02 - .05	4.1
NITRITE, AS NITROGEN	mg/L	UNF	2/5	2/5	-	.03 - .03	.02 - .02	NA
PH		UNF	25/25	25/25	7.5	7.22 - 8.2		NA
PHENOLS	mg/L	UNF	1/28	0/28	-	.014 - .014	.002 - .15	0.03
PHOSPHATE	mg/L	UNF	1/1	1/1	-	.01 - .01		NA
PHOSPHORUS	mg/L	UNF	13/29	13/29	-	.04 - 13	.03 - .306	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	25/25	25/25	647	483 - 760		NA
SULFATE	mg/L	UNF	28/28	0/28	79	41 - 143		197

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
SULFIDE	mg/L	UNF	1/24	1/24	-	.5 - .5	.2 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	14/14	0/14	385	318 - 525		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	16/26	0/26	0.12	.1 - .66	.1 - .2	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	11/28	3/28	-	1 - 5	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	6/27	1/27	-	.02 - .052	.01 - 10	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	1/18	1/18	-	.018 - .018	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	11/27	0/27	-	.03 - .57	-.13 - .19	0.9
TOTAL SOLIDS	mg/L	UNF	24/24	24/24	405	340 - 563		NA
1,2,3-TRICHLOROPROPANE	ug/L	UNF	0/3	0/3	-		1 - 5	NA
1,2,4,5-TETRACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	UNF	0/3	0/3	-		2 - 20	NA
1,2-DIBROMOETHANE	ug/L	UNF	0/3	0/3	-		2 - 20	NA
1,3,5-TRINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,3-DINITROBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1,4-NAPHTHOQUINONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
1-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2,3,4,6-TETRACHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2,6-DICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-ACETYLAMINOFLUORENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2-CHLORO-1,3-BUTADIENE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
2-NAPHTHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
2-PICOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3,3'-DIMETHYLBENZIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLCHOLANTHRENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
3-METHYLPHENOL	ug/L	UNF	0/1	0/1	-		4 - 4	NA
4-AMINOBIPHENYL	ug/L	UNF	0/1	0/1	-		15 - 15	NA
4-NITROQUINOLINE-1-OXIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
5-NITRO-O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
7,12-DIMETHYLBENZ(A)ANTHRACENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
A,A-DIMETHYLPHENETHYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACETONITRILE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
ACETOPHENONE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ACROLEIN	ug/L	UNF	0/4	0/4	-		20 - 50	NA
ACROLEIN	ug/L	UNF	0/4	0/4	-		20 - 50	NA
ACRYLONITRILE	ug/L	UNF	0/4	0/4	-		20 - 50	NA
ALACHLOR	ug/L	UNF	0/3	0/3	-		2000 - 2000	NA
ANILINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ARAMITE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ATRAZINE	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
CARBOFURAN	ug/L	UNF	0/3	0/3	-		1000000 - 1000000	NA
CYANAZINE	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
DIALLATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
DIBROMOMETHANE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DICHLORODIFLUOROMETHANE	ug/L	UNF	0/3	0/3	-		1 - 10	NA
DINOSEB	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DIPHENYLAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
ETHYL CYANIDE	ug/L	UNF	0/3	0/3	-		20 - 20	NA
ETHYL METHACRYLATE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
ETHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
FONOFOS	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
HEXACHLOROPHENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
HEXACHLOROPROPENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
IODOMETHANE	ug/L	UNF	0/3	0/3	-		5 - 20	NA

000291

TABLE E.2-17
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
ISODRIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ISOSAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
KEPONE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
LINURON	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
METHACRYLONITRILE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
METHAPYRILENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METHYL METHACRYLATE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
METHYL METHANESULFONATE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
METOLACHLOR	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
METRIBUZIN	ug/L	UNF	0/3	0/3	-		1000 - 1000	NA
N-NITROSODI-N-BUTYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSODIETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMETHYLETHYLAMINE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
N-NITROSOMORPHOLINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPIPERIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
N-NITROSOPYRROLIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
O-TOLUIDINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-DIMETHYLAMINOAZOBENZENE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
P-PHENYLENEDIAMINE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
PENTACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PENTACHLOROETHANE	ug/L	UNF	0/3	0/3	-		5 - 20	NA
PENTACHLORONITROBENZENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PHENACETIN	ug/L	UNF	0/1	0/1	-		4 - 4	NA
PRONAMIDE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
SAFROLE	ug/L	UNF	0/1	0/1	-		15 - 15	NA
SIMIZINE	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TERBUFOS	ug/L	UNF	0/1	0/1	-		1000 - 1000	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/14	0/14	-		1 - 1	NA
TRANS-1,4-DICHLORO-2-BUTENE	ug/L	UNF	0/2	0/2	-		20 - 20	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

TABLE E.2-18
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	3/4	1/4	0.55	.5 - 1	.6 - .6	0.9
URANIUM-238	pCi/L	UNF	0/4	0/4	-		.3 - 1	0.64
URANIUM, TOTAL	ug/L	FIL	2/4	0/4	0.25	.2 - .3	.1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	4/5	2/5	0.6	.3 - 103	.1 - .1	1.2
URANIUM-234	pCi/L	FIL	4/4	1/4	0.6	.5 - 2		0.9
URANIUM-234	pCi/L	UNF	2/4	1/4	0.7	.4 - 2.24	.4 - .4	0.8
THORIUM-230	pCi/L	FIL	1/4	1/4	-	.4 - .4	.2 - 1	0.29
THORIUM-230	pCi/L	UNF	2/4	0/4	0.35	.3 - .4	.3 - 2.4	0.89
RADIUM-226	pCi/L	FIL	2/4	0/4	0.8	1.1 - 1.7	1 - 1	1.9
RADIUM-226	pCi/L	UNF	0/4	0/4	-		.6 - 1	105
URANIUM-235/236	pCi/L	FIL	0/4	0/4	-		.2 - 1	ND
URANIUM-235/236	pCi/L	UNF	0/4	0/4	-		.2 - 1	0.094
THORIUM-232	pCi/L	FIL	1/4	1/4	-	.4 - .4	.2 - 1	0.3
THORIUM-232	pCi/L	UNF	0/4	0/4	-		.2 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	3/3	2/3	3.648	1.824 - 4.9		2.8
THORIUM, TOTAL	ug/L	UNF	1/3	1/3	-	1.824 - 1.824	6.5 - 8.6	0.97
RADIUM-228	pCi/L	FIL	0/4	0/4	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/4	0/4	-		3 - 3	3.6
THORIUM-228	pCi/L	FIL	1/4	0/4	-	.3 - .3	.2 - 1	0.4
THORIUM-228	pCi/L	UNF	0/4	0/4	-		.2 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	0/1	0/1	-		1 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/3	0/3	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/1	0/1	-		1 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/3	0/3	-		1 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/1	0/1	-		1 - 1	ND
PLUTONIUM-238	pCi/L	UNF	0/3	0/3	-		1 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/1	0/1	-		5 - 5	ND
STRONTIUM-90	pCi/L	UNF	0/3	0/3	-		5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/1	0/1	-		30 - 30	ND
TECHNETIUM-99	pCi/L	UNF	0/4	0/4	-		15 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/1	0/1	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/3	0/3	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/1	0/1	-		20 - 20	ND
CESIUM-137	pCi/L	UNF	0/3	0/3	-		8.8 - 20	ND
GROSS ALPHA	pCi/L	FIL	1/4	1/4	-	1.8 - 1.8	2.6 - 3.2	NA
GROSS ALPHA	pCi/L	UNF	3/4	3/4	3.5	2.4 - 51.1	2.3 - 2.3	NA
GROSS BETA	pCi/L	FIL	2/4	2/4	2.1	2.6 - 3.9	2.8 - 3.2	NA
GROSS BETA	pCi/L	UNF	3/4	3/4,	24.8	12.8 - 67.7	2.6 - 2.6	NA
ALUMINUM	mg/L	FIL	1/4	0/4	-	.106 - .106	.014 - .0288	0.175
ALUMINUM	mg/L	UNF	2/4	0/4	0.024	.038 - .073	.014 - .02	0.225
ANTIMONY	mg/L	FIL	0/4	0/4	-		.03 - .045	ND
ANTIMONY	mg/L	UNF	0/3	0/3	-		.045 - .045	ND
ARSENIC	mg/L	FIL	3/4	0/4	0.002	.0016 - .0048	.002 - .002	0.26
ARSENIC	mg/L	UNF	4/4	0/4	0.022	.0013 - .0048		0.0294
BARIUM	mg/L	FIL	3/4	0/4	0.058	.058 - .0935	.0683 - .0683	0.669
BARIUM	mg/L	UNF	2/4	0/4	0.062	.0609 - .0623	.0729 - .0729	0.768
BERYLLIUM	mg/L	FIL	0/4	0/4	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/3	0/3	-		.001 - .001	ND
CADMIUM	mg/L	FIL	1/4	0/4	-	.0044 - .0044	.003 - .003	0.006
CADMIUM	mg/L	UNF	1/4	0/4	-	.003 - .003	.003 - .003	0.0135
CALCIUM	mg/L	FIL	4/4	0/4	89	86.7 - 90.8		136
CALCIUM	mg/L	UNF	4/4	0/4	90	85.7 - 97.5		159
CHROMIUM	mg/L	FIL	1/4	1/4	-	.0308 - .0308	.005 - .0106	0.03

000293

TABLE E.2-18
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHROMIUM	mg/L	UNF	1/4	1/4	-	.024 - .024	.005 - .007	0.0211
COBALT	mg/L	FIL	0/4	0/4	-		.006 - .02	ND
COBALT	mg/L	UNF	1/3	0/3	-	.0058 - .0058	.006 - .008	0.0086
COPPER	mg/L	FIL	1/4	0/4	-	.011 - .011	.004 - .008	0.083
COPPER	mg/L	UNF	1/4	0/4	-	.01 - .01	.003 - .008	0.0354
CYANIDE	mg/L	FIL	0/3	0/3	-		.01 - .01	ND
CYANIDE	mg/L	UNF	0/3	0/3	-		.01 - .01	ND
IRON	mg/L	FIL	4/4	0/4	2.42	1.12 - 3.08		4.14
IRON	mg/L	UNF	4/4	0/4	2.5	.018 - 3.23		5.72
LEAD	mg/L	FIL	0/4	0/4	-		.001 - .002	0.009
LEAD	mg/L	UNF	2/4	2/4	0.002	.002 - .0027	.002 - .0021	0.002
MAGNESIUM	mg/L	FIL	4/4	0/4	22.1	20.3 - 23.6		37.8
MAGNESIUM	mg/L	UNF	4/4	0/4	22.8	20.4 - 25.5		38.5
MANGANESE	mg/L	FIL	4/4	0/4	0.435	.285 - .623		0.78
MANGANESE	mg/L	UNF	4/4	0/4	0.318	.004 - .564		0.904
MERCURY	mg/L	FIL	0/4	0/4	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	1/4	1/4	-	.0002 - .0002	.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	0/3	0/3	-		.01 - .02	0.025
MOLYBDENUM	mg/L	UNF	1/2	1/2	-	.01 - .01	.025 - .025	ND
NICKEL	mg/L	FIL	0/4	0/4	-		.019 - .02	0.023
NICKEL	mg/L	UNF	1/4	0/4	-	.02 - .02	.019 - .02	0.0514
POTASSIUM	mg/L	FIL	4/4	0/4	1.58	1.45 - 2.58		3.32
POTASSIUM	mg/L	UNF	4/4	2/4	1.65	1.08 - 2.78		1.96
SELENIUM	mg/L	FIL	0/4	0/4	-		.001 - .002	0.004
SELENIUM	mg/L	UNF	2/4	2/4	0.0012	.0013 - .0016	.002 - .002	0.00075
SILICON	mg/L	FIL	1/1	1/1	-	5.65 - 5.65		3.46
SILICON	mg/L	UNF	1/1	0/1	-	4.91 - 4.91		5.81
SILVER	mg/L	FIL	1/4	1/4	-	.0232 - .0232	.003 - .007	0.0138
SILVER	mg/L	UNF	1/4	1/4	-	.023 - .023	.003 - .007	0.0117
SODIUM	mg/L	FIL	4/4	0/4	10.5	8.09 - 12.3		55
SODIUM	mg/L	UNF	4/4	0/4	10.6	8.93 - 14.1		47.1
THALLIUM	mg/L	FIL	0/4	0/4	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/3	0/3	-		.001 - .002	ND
VANADIUM	mg/L	FIL	1/4	0/4	-	.0143 - .0143	.003 - .004	0.0234
VANADIUM	mg/L	UNF	1/4	0/4	-	.011 - .011	.003 - .004	0.0117
ZINC	mg/L	FIL	0/4	0/4	-		.003 - .0167	0.0568
ZINC	mg/L	UNF	1/3	1/3	-	.0474 - .0474	.0196 - .0209	0.021
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/3	0/3	-		10 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
2-BUTANONE	ug/L	UNF	1/3	1/3	-	24 - 24	10 - 10	NA
2-HEXANONE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
ACETONE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
BENZENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
BROMOFORM	ug/L	UNF	0/3	0/3	-		10 - 10	NA
BROMOMETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA

000294
1619

TABLE E.2-18
SUMMARY STATISTICS FOR FEMP SOUTH PLUME B TYPE 4 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBON DISULFIDE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CHLOROBENZENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CHLOROETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CHLOROFORM	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
ETHYLBENZENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
METHYLENE CHLORIDE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
STYRENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
TETRACHLOROETHENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
TOLUENE	ug/L	UNF	1/3	1/3	-	1 - 1	10 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/4	0/4	-		10 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
VINYL ACETATE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
VINYL CHLORIDE	ug/L	UNF	0/3	0/3	-		10 - 10	NA
XYLENES, TOTAL	ug/L	UNF	0/3	0/3	-		10 - 10	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/2	0/2	-		10 - 10	NA
ALKALINITY AS CACO3	mg/L	UNF	3/3	3/3	235	230 - 244		NA
AMMONIA	mg/L	UNF	4/4	0/4	0.1	.06 - .14		4.2
BICARBONATE	mg/L	UNF	1/1	1/1	-	242 - 242		NA
BICARBONATE ALKALINITY	mg/L	UNF	4/4	4/4	300	280 - 323		NA
CARBONATE ALKALINITY	mg/L	UNF	0/4	0/4	-		3 - 30	NA
CHLORIDE	mg/L	UNF	4/4	0/4	23	22 - 24		73
FLUORIDE	mg/L	UNF	4/4	0/4	0.15	.1 - .16		0.89
NITRATE	mg/L	UNF	2/3	0/3	0.16	.16 - .65	.103 - .103	11.4
NITRATE, AS NITROGEN	mg/L	UNF	0/2	0/2	-		.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	2/3	0/3	0.03	.03 - .08	.02 - .02	4.1
PH		UNF	4/4	4/4	7.55	7.45 - 7.89		NA
PHENOLS	mg/L	UNF	0/4	0/4	-		.01 - .01	0.03
PHOSPHORUS	mg/L	UNF	3/4	3/4	0.18	.07 - .27	.306 - .306	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	4/4	4/4	615	590 - 740		NA
SULFATE	mg/L	UNF	4/4	0/4	73	38 - 101		197
SULFIDE	mg/L	UNF	0/1	0/1	-		.5 - .5	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	2/2	0/2	412	398 - 426		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	3/3	0/3	0.22	.2 - .9		3.3
TOTAL ORGANIC CARBON	mg/L	UNF	2/4	1/4	1.3	2 - 9	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/4	0/4	-	.01 - .01	.01 - .01	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	0/3	0/3	-		.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	2/4	0/4	0.14	.22 - .79	.1 - .1	0.9
TOTAL SOLIDS	mg/L	UNF	4/4	4/4	393	370 - 440		NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000295

TABLE E.2-19
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	5/8	5/8	1.1	1.01 - 5.97	.2 - 1	0.9
URANIUM-238	pCi/L	UNF	5/7	5/7	1.1	.7 - 2.79	.2 - 3.4	0.64
URANIUM, TOTAL	ug/L	FIL	6/8	6/8	3.3	1.7 - 11.4	1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	7/7	6/7	4.7	.77 - 8.39		1.2
URANIUM-234	pCi/L	FIL	6/8	6/8	1	.9 - 4.4	1 - 1	0.9
URANIUM-234	pCi/L	UNF	5/7	5/7	1.7	.8 - 2.42	.2 - 3.4	0.8
THORIUM-230	pCi/L	FIL	1/8	1/8	-	3.08 - 3.08	.2 - 1	0.29
THORIUM-230	pCi/L	UNF	2/7	1/7	-	.4 - 1.1	.4 - 1	0.89
RADIUM-226	pCi/L	FIL	3/8	1/8	-	1.3 - 3.3	1 - 1	1.9
RADIUM-226	pCi/L	UNF	2/7	0/7	-	2.1 - 2.6	1 - 1	105
URANIUM-235/236	pCi/L	FIL	1/8	1/8	-	.8 - .8	.2 - 1	ND
URANIUM-235/236	pCi/L	UNF	0/7	0/7	-		.2 - 3.4	0.094
THORIUM-232	pCi/L	FIL	1/8	1/8	-	1.3 - 1.3	.2 - 1	0.3
THORIUM-232	pCi/L	UNF	1/7	1/7	-	1.3 - 1.3	.2 - 1.1	0.23
THORIUM, TOTAL	ug/L	FIL	2/8	2/8	-	4.56 - 9.12	1.6 - 9.3	2.8
THORIUM, TOTAL	ug/L	UNF	3/6	2/6	4.7	.912 - 11.856	1.9 - 9.5	0.97
RADIUM-228	pCi/L	FIL	0/8	0/8	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	0/7	0/7	-		3 - 3	3.6
THORIUM-228	pCi/L	FIL	2/8	2/8	-	1.66 - 2.09	.2 - 1	0.4
THORIUM-228	pCi/L	UNF	2/7	2/7	-	1.89 - 1.97	.2 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	0/8	0/8	-		1 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/6	0/6	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/8	0/8	-		1 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/6	0/6	-		1 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/8	0/8	-		1 - 1	ND
PLUTONIUM-238	pCi/L	UNF	0/6	0/6	-		1 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/8	0/8	-		5 - 5	ND
STRONTIUM-90	pCi/L	UNF	0/6	0/6	-		5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/8	0/8	-		30 - 30	ND
TECHNETIUM-99	pCi/L	UNF	0/6	0/6	-		30 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/8	0/8	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/6	0/6	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/8	0/8	-		20 - 20	ND
CESIUM-137	pCi/L	UNF	0/6	0/6	-		9.6 - 20	ND
GROSS ALPHA	pCi/L	FIL	6/8	6/8	4.5	2.2 - 12.3	3.9 - 5.1	NA
GROSS ALPHA	pCi/L	UNF	3/5	3/5	5.1	5.1 - 15.6	3.7 - 4.1	NA
GROSS BETA	pCi/L	FIL	7/8	7/8	12	5.47 - 99.6	2.7 - 2.7	NA
GROSS BETA	pCi/L	UNF	3/5	3/5	13.9	5.8 - 130	4.2 - 28	NA
ALUMINUM	mg/L	FIL	4/8	0/8	0.053	.092 - .101	.0151 - .0282	0.175
ALUMINUM	mg/L	UNF	1/4	1/4	-	2.59 - 2.59	.02 - .038	0.225
ANTIMONY	mg/L	FIL	0/8	0/8	-		.03 - .045	ND
ANTIMONY	mg/L	UNF	0/4	0/4	-		.045 - .045	ND
ARSENIC	mg/L	FIL	2/8	0/8	-	.0054 - .161	.002 - .01	0.26
ARSENIC	mg/L	UNF	2/4	1/4	-	.0024 - .168	.002 - .002	0.0294
BARIUM	mg/L	FIL	8/8	0/8	0.0486	.0119 - .551		0.669
BARIUM	mg/L	UNF	4/4	0/4	0.1253	.0034 - .584		0.768
BERYLLIUM	mg/L	FIL	0/8	0/8	-		.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/4	0/4	-		.001 - .001	ND
CADMIUM	mg/L	FIL	4/8	0/8	0.0025	.0036 - .0046	.003 - .003	0.006
CADMIUM	mg/L	UNF	0/4	0/4	-		.003 - .003	0.0135
CALCIUM	mg/L	FIL	8/8	0/8	94.2	51.8 - 115		136
CALCIUM	mg/L	UNF	4/4	0/4	67.5	1.63 - 133		159
CHROMIUM	mg/L	FIL	4/8	0/8	0.0136	.0235 - .0285	.005 - .0073	0.03

TABLE E.2-19
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHROMIUM	mg/L	UNF	1/4	0/4	-	.0206 - .0206	.005 - .024	0.0211
COBALT	mg/L	FIL	0/8	0/8	-		.006 - .02	ND
COBALT	mg/L	UNF	0/4	0/4	-		.006 - .008	0.0086
COPPER	mg/L	FIL	1/8	0/8	-	.0109 - .0109	.004 - .0137	0.083
COPPER	mg/L	UNF	3/4	0/4	0.0057	.005 - .0115	.004 - .004	0.0354
CYANIDE	mg/L	FIL	0/4	0/4	-		.01 - .01	ND
CYANIDE	mg/L	UNF	0/4	0/4	-		.01 - .01	ND
IRON	mg/L	FIL	6/8	1/8	0.039	.0216 - 9.85	.0404 - .0528	4.14
IRON	mg/L	UNF	3/4	1/4	2.88	.342 - 10.6	.0944 - .0944	5.72
LEAD	mg/L	FIL	3/8	0/8	0.001	.0011 - .0014	.0018 - .002	0.009
LEAD	mg/L	UNF	1/4	0/4	-	.0011 - .0011	.001 - .0032	0.002
MAGNESIUM	mg/L	FIL	8/8	0/8	25.9	21.8 - 28.9		37.8
MAGNESIUM	mg/L	UNF	4/4	0/4	23.6	.285 - 29.9		38.5
MANGANESE	mg/L	FIL	8/8	2/8	0.011	.0016 - 1.58		0.78
MANGANESE	mg/L	UNF	4/4	1/4	0.164	.0059 - .953		0.904
MERCURY	mg/L	FIL	0/8	0/8	-		.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/5	0/5	-		.0002 - .0002	ND
MOLYBDENUM	mg/L	FIL	3/8	0/8	-	.0111 - .0118	.01 - .01	0.025
NICKEL	mg/L	FIL	1/8	1/8	-	.135 - .135	.019 - .02	0.023
NICKEL	mg/L	UNF	0/4	0/4	-		.019 - .02	0.0514
POTASSIUM	mg/L	FIL	8/8	5/8	4.25	1.85 - 178		3.32
POTASSIUM	mg/L	UNF	3/4	3/4	8.61	3.51 - 182	.35 - .35	1.96
SELENIUM	mg/L	FIL	0/8	0/8	-		.001 - .002	0.004
SELENIUM	mg/L	UNF	2/4	2/4	0.001	.0016 - .0016	.001 - .002	0.00075
SILICON	mg/L	FIL	8/8	8/8	5.97	3.59 - 20.3		3.46
SILVER	mg/L	FIL	4/8	4/8	0.012	.0205 - .0245	.003 - .007	0.0138
SILVER	mg/L	UNF	0/4	0/4	-		.003 - .007	0.0117
SODIUM	mg/L	FIL	8/8	1/8	14.1	7.32 - 98.5		55
SODIUM	mg/L	UNF	3/4	1/4	14.2	13.9 - 101	.182 - .182	47.1
THALLIUM	mg/L	FIL	0/8	0/8	-		.001 - .002	ND
THALLIUM	mg/L	UNF	0/4	0/4	-		.0012 - .002	ND
VANADIUM	mg/L	FIL	5/8	0/8	0.0071	.0031 - .0141	.003 - .004	0.0234
VANADIUM	mg/L	UNF	1/4	0/4	-	.0071 - .0071	.003 - .004	0.0117
ZINC	mg/L	FIL	0/8	0/8	-		.006 - .0231	0.0568
ZINC	mg/L	UNF	3/4	0/4	0.0059	.0053 - .0148	.006 - .006	0.021
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/5	0/5	-		5 - 10	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
2-BUTANONE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
2-HEXANONE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
ACETONE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
BENZENE	ug/L	UNF	1/5	1/5	-	4 - 4	5 - 10	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
BROMOFORM	ug/L	UNF	0/5	0/5	-		5 - 10	NA
BROMOMETHANE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
CARBON DISULFIDE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
CARBON TETRACHLORIDE	ug/L	UNF	0/5	0/5	-		5 - 10	NA

000297

TABLE E.2-19
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CHLOROBENZENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
CHLOROETHANE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
CHLOROFORM	ug/L	UNF	0/5	0/5	-		5 - 10	NA
CHLOROMETHANE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
ETHYLBENZENE	ug/L	UNF	3/5	3/5	5	4 - 21	10 - 10	NA
METHYLENE CHLORIDE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
STYRENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
TETRACHLOROETHENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
TOLUENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
TRICHLOROETHENE	ug/L	UNF	0/5	0/5	-		5 - 10	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/3	0/3	-		2 - 10000	NA
VINYL CHLORIDE	ug/L	UNF	0/5	0/5	-		10 - 10	NA
XYLENES, TOTAL	ug/L	UNF	3/5	3/5	5	3 - 54	10 - 10	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/3	0/3	-		1 - 2	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/3	0/3	-		1 - 2	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2,4-DINITROPHENOL	ug/L	UNF	0/2	0/2	-		15 - 15	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	0/2	0/2	-		10 - 60	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2-CHLOROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
2-METHYLPHENOL	ug/L	UNF	0/2	0/2	-		1 - 1	NA
2-NITROANILINE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
2-NITROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
3,3'-DICHLOROBENZIDINE	ug/L	UNF	0/2	0/2	-		20 - 20	NA
3-NITROANILINE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/2	0/2	-		15 - 15	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/2	0/2	-		2 - 2	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/2	0/2	-		1 - 1	NA
4-METHYLPHENOL	ug/L	UNF	0/2	0/2	-		1 - 1	NA
4-NITROANILINE	ug/L	UNF	0/2	0/2	-		3 - 3	NA
4-NITROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
ACENAPHTHENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
ACENAPHTHYLENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
ANTHRACENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BENZO(A)PYRENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/2	0/2	-		4 - 4	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BENZOIC ACID	ug/L	UNF	0/2	0/2	-		20 - 20	NA

TABLE E.2-19
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZYL ALCOHOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/2	0/2	-		2 - 2	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	0/2	0/2	-		4 - 4	NA
CHRYSENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
DIBENZOFURAN	ug/L	UNF	0/2	0/2	-		1 - 1	NA
DIETHYL PHTHALATE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
FLUORANTHENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
FLUORENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
HEXACHLOROBENZENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
HEXACHLOROETHANE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/2	0/2	-		4 - 4	NA
ISOPHORONE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
NAPHTHALENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
NITROBENZENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
P-CHLOROANILINE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
PENTACHLOROPHENOL	ug/L	UNF	0/2	0/2	-		2 - 2	NA
PHENANTHRENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
PHENOL	ug/L	UNF	0/3	0/3	-		2 - 10	NA
PYRENE	ug/L	UNF	0/2	0/2	-		2 - 2	NA
4,4'-DDD	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
4,4'-DDE	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
4,4'-DDT	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
ALDRIN	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
ALPHA-BHC	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
ALPHA-CHLORDANE	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
AROCLOR-1016	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
AROCLOR-1221	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
AROCLOR-1232	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
AROCLOR-1242	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
AROCLOR-1248	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
AROCLOR-1254	ug/L	UNF	0/1	0/1	-		.1 - .1	NA
AROCLOR-1260	ug/L	UNF	0/1	0/1	-		.1 - .1	NA
BETA-BHC	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
DELTA-BHC	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
DIELDRIN	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
ENDOSULFAN II	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
ENDOSULFAN-I	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
ENDRIN	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
ENDRIN KETONE	ug/L	UNF	0/1	0/1	-		.01 - .01	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
GAMMA-CHLORDANE	ug/L	UNF	0/1	0/1	-		.05 - .05	NA

000299

TABLE E.2-19
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
HEPTACHLOR	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/1	0/1	-		.005 - .005	NA
METHOXYCHLOR	ug/L	UNF	0/1	0/1	-		.05 - .05	NA
TOXAPHENE	ug/L	UNF	0/1	0/1	-		.1 - .1	NA
AZINPHOSMETHYL	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DEMETON	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DIAZINON	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
DISULFOTON	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
ETHION	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
MALATHION	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
METHYL PARATHION	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
PARATHION	ug/L	UNF	0/1	0/1	-		.5 - .5	NA
2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	ng/L	UNF	1/1	1/1	-	1.7 - 1.7		NA
2,3,7,8-TETRACHLORODIBENZOFURAN	ng/L	UNF	1/1	1/1	-	1.2 - 1.2		NA
HEPTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		.58 - .58	NA
HEPTACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.64 - .64	NA
HEXACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		.55 - .55	NA
HEXACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.56 - .56	NA
OCTACHLORODIBENZO-P-DIOXIN	ng/L	UNF	0/1	0/1	-		1.2 - 1.2	NA
OCTACHLORODIBENZOFURAN	ng/L	UNF	0/1	0/1	-		.99 - .99	NA
PENTACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		.94 - .94	NA
PENTACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.62 - .62	NA
TETRACHLORODIBENZO-P-DIOXINS	ng/L	UNF	0/1	0/1	-		.3 - .3	NA
TETRACHLORODIBENZOFURANS	ng/L	UNF	0/1	0/1	-		.46 - .46	NA
ALKALINITY AS CACO3	mg/L	UNF	4/4	4/4	280	270 - 412		NA
AMMONIA	mg/L	UNF	3/8	0/8	-	.209 - 3.1	.07 - .1	4.2
BICARBONATE ALKALINITY	mg/L	UNF	3/3	3/3	366	366 - 537		NA
CARBONATE ALKALINITY	mg/L	UNF	0/3	0/3	-		3 - 3	NA
CHEMICAL OXYGEN DEMAND	mg/L	UNF	1/1	1/1	-	92 - 92		NA
CHLORIDE	mg/L	UNF	8/8	0/8	23	13.3 - 54		73
FLUORIDE	mg/L	UNF	7/8	0/8	0.15	.11 - .2	.1 - .1	0.89
NITRATE	mg/L	UNF	5/8	0/8	0.28	.139 - 1.44	.029 - .1	11.4
NITRATE, AS NITROGEN	mg/L	UNF	1/2	1/2	-	.98 - .98	.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	1/3	0/3	-	.17 - .17	.05 - .09	4.1
PH	-	UNF	4/4	4/4	7.19	7.09 - 7.47		NA
PHENOLS	mg/L	UNF	2/8	0/8	-	.004 - .02	.01 - .01	0.03
PHOSPHATE	mg/L	UNF	0/1	0/1	-			NA
PHOSPHORUS	mg/L	UNF	4/8	4/8	0.16	.03 - 2.8	.02 - .33	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	4/4	4/4	771	612 - 1270		NA
SULFATE	mg/L	UNF	6/8	0/8	57	25 - 111	2 - 2	197
SULFIDE	mg/L	UNF	0/8	0/8	-		.5 - 1	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	1/1	1/1	-	880 - 880		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	4/5	1/5	0.26	.15 - 3.3	.1 - .1	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	5/8	3/8	1.3	1 - 49	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/8	0/8	-	.011 - .011	.01 - .0103	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	1/4	1/4	-	.012 - .012	.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	4/8	0/8	0.09	.122 - .2	.1 - .1	0.9
TOTAL SOLIDS	mg/L	UNF	3/3	3/3	525	383 - 552		NA
ACROLEIN	ug/L	UNF	0/1	0/1	-		25 - 25	NA
ACROLEIN	ug/L	UNF	0/1	0/1	-		25 - 25	NA
ACRYLONITRILE	ug/L	UNF	0/1	0/1	-		25 - 25	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA

TABLE E.2-19
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 2 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000304

TABLE E.2-20
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
URANIUM-238	pCi/L	FIL	0/2	0/2	-		1 - 1	0.9
URANIUM-238	pCi/L	UNF	0/2	0/2	-		1 - 1	0.64
URANIUM, TOTAL	ug/L	FIL	0/2	0/2	-		1 - 1	0.8
URANIUM, TOTAL	ug/L	UNF	1/2	0/2	-	1.16 - 1.16	0.75 - .75	1.2
URANIUM-234	pCi/L	FIL	1/2	1/2	-	1.3 - 1.3	1 - 1	0.9
URANIUM-234	pCi/L	UNF	0/2	0/2	-		1 - 1	0.8
THORIUM-230	pCi/L	FIL	1/2	1/2	-	1.47 - 1.47	1 - 1	0.29
THORIUM-230	pCi/L	UNF	0/2	0/2	-		1 - 1	0.89
RADIUM-226	pCi/L	FIL	1/2	1/2	-	2.29 - 2.29	1 - 1	1.9
RADIUM-226	pCi/L	UNF	1/2	0/2	-	3.5 - 3.5	1 - 1	105
URANIUM-235/236	pCi/L	FIL	0/2	0/2	-		1 - 1	ND
URANIUM-235/236	pCi/L	UNF	0/2	0/2	-		1 - 1	0.094
THORIUM-232	pCi/L	FIL	0/2	0/2	-		1 - 1	0.3
THORIUM-232	pCi/L	UNF	0/2	0/2	-		1 - 1	0.23
THORIUM, TOTAL	ug/L	FIL	0/2	0/2	-		1.6 - 8.5	2.8
THORIUM, TOTAL	ug/L	UNF	0/2	0/2	-		1.4 - 2.1	0.97
RADIUM-228	pCi/L	FIL	0/2	0/2	-		3 - 3	ND
RADIUM-228	pCi/L	UNF	1/2	1/2	-	7.1 - 7.1	3 - 3	3.6
THORIUM-228	pCi/L	FIL	1/2	1/2	-	1.47 - 1.47	1 - 1	0.4
THORIUM-228	pCi/L	UNF	0/2	0/2	-		1 - 1	0.77
NEPTUNIUM-237	pCi/L	FIL	0/2	0/2	-		1 - 1	0.12
NEPTUNIUM-237	pCi/L	UNF	0/2	0/2	-		1 - 1	ND
PLUTONIUM-239/240	pCi/L	FIL	0/2	0/2	-		1 - 1	0.042
PLUTONIUM-239/240	pCi/L	UNF	0/2	0/2	-		1 - 1	0.05
PLUTONIUM-238	pCi/L	FIL	0/2	0/2	-		1 - 1	ND
PLUTONIUM-238	pCi/L	UNF	0/2	0/2	-		1 - 1	0.048
STRONTIUM-90	pCi/L	FIL	0/2	0/2	-		5 - 5	ND
STRONTIUM-90	pCi/L	UNF	0/2	0/2	-		5 - 5	ND
TECHNETIUM-99	pCi/L	FIL	0/2	0/2	-		30 - 30	ND
TECHNETIUM-99	pCi/L	UNF	0/2	0/2	-		30 - 30	ND
RUTHENIUM-106	pCi/L	FIL	0/2	0/2	-		150 - 150	ND
RUTHENIUM-106	pCi/L	UNF	0/2	0/2	-		150 - 150	ND
CESIUM-137	pCi/L	FIL	0/2	0/2	-		20 - 20	ND
CESIUM-137	pCi/L	UNF	0/2	0/2	-		9.2 - 9.2	ND
GROSS ALPHA	pCi/L	FIL	1/2	1/2	-	3.39 - 3.39	14 - 14	NA
GROSS ALPHA	pCi/L	UNF	0/2	0/2	-		8.6 - 12	NA
GROSS BETA	pCi/L	FIL	2/2	2/2	93.3	6.66 - 180		NA
GROSS BETA	pCi/L	UNF	1/2	1/2	-	195 - 195	25 - 25	NA
URANIUM-235	pCi/L	UNF	1/1	1/1	-	.017 - .017		NA
URANIUM-236	pCi/L	UNF	1/1	1/1	-	.009 - .009		NA
ALUMINUM	mg/L	FIL	2/2	0/2	0.103	.0974 - .108		0.175
ALUMINUM	mg/L	UNF	1/1	0/1	-	.15 - .15		0.225
ANTIMONY	mg/L	FIL	0/2	0/2	-		0.03 - .03	ND
ANTIMONY	mg/L	UNF	0/1	0/1	-		0.035 - .035	ND
ARSENIC	mg/L	FIL	0/2	0/2	-		0.002 - .002	0.26
ARSENIC	mg/L	UNF	1/1	0/1	-	.002 - .002		0.0294
BARIUM	mg/L	FIL	2/2	0/2	0.079	.0247 - .134		0.669
BARIUM	mg/L	UNF	1/1	0/1	-	.188 - .188		0.768
BERYLLIUM	mg/L	FIL	0/2	0/2	-		0.001 - .001	0.0022
BERYLLIUM	mg/L	UNF	0/1	0/1	-		0.001 - .001	ND
CADMIUM	mg/L	FIL	2/2	0/2	0.0032	.003 - .0033		0.006
CADMIUM	mg/L	UNF	0/1	0/1	-		0.005 - .005	0.0135
CALCIUM	mg/L	FIL	2/2	0/2	65	44.5 - 86.6		136

000302

TABLE E.2-20
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CALCIUM	mg/L	UNF	1/1	0/1	-	54.6 - 54.6		159
CHROMIUM	mg/L	FIL	2/2	0/2	-	.0192 - .0202		0.03
CHROMIUM	mg/L	UNF	0/1	0/1	-		0.006 - .006	0.0211
COBALT	mg/L	FIL	0/2	0/2	-		0.02 - .02	ND
COBALT	mg/L	UNF	0/1	0/1	-		0.004 - .004	0.0086
COPPER	mg/L	FIL	0/2	0/2	-		0.01 - .01	0.083
COPPER	mg/L	UNF	0/1	0/1	-		0.008 - .008	0.0354
CYANIDE	mg/L	UNF	0/1	0/1	-		0.005 - .005	ND
IRON	mg/L	FIL	2/2	0/2	0.86	.112 - 1.6		4.14
IRON	mg/L	UNF	1/1	0/1	-	1.44 - 1.44		5.72
LEAD	mg/L	FIL	0/2	0/2	-		0.002 - .002	0.009
LEAD	mg/L	UNF	1/1	1/1	-	.002 - .002		0.002
MAGNESIUM	mg/L	FIL	2/2	0/2	20.5	17.6 - 23.4		37.8
MAGNESIUM	mg/L	UNF	1/1	0/1	-	22.5 - 22.5		38.5
MANGANESE	mg/L	FIL	2/2	0/2	0.103	.0823 - .124		0.78
MANGANESE	mg/L	UNF	1/1	0/1	-	.138 - .138		0.904
MERCURY	mg/L	FIL	0/2	0/2	-		0.0002 - .0002	0.0004
MERCURY	mg/L	UNF	0/2	0/2	-		2E-07 - .0002	ND
MOLYBDENUM	mg/L	FIL	1/2	0/2	-	.0142 - .0142	0.01 - .01	0.025
NICKEL	mg/L	FIL	0/2	0/2	-		0.02 - .02	0.023
NICKEL	mg/L	UNF	0/1	0/1	-		0.039 - .039	0.0514
POTASSIUM	mg/L	FIL	2/2	1/2	113	2.33 - 225		3.32
POTASSIUM	mg/L	UNF	1/1	1/1	-	268 - 268		1.96
SELENIUM	mg/L	FIL	0/2	0/2	-		0.002 - .002	0.004
SELENIUM	mg/L	UNF	0/1	0/1	-		0.002 - .002	0.00075
SILICON	mg/L	FIL	2/2	2/2	8.5	6.2 - 10.9		3.46
SILVER	mg/L	FIL	2/2	1/2	0.155	.013 - .0191		0.0138
SILVER	mg/L	UNF	0/1	0/1	-		0.008 - .008	0.0117
SODIUM	mg/L	FIL	2/2	0/2	27.9	6.04 - 49.7		55
SODIUM	mg/L	UNF	1/1	0/1	-	36.8 - 36.8		47.1
THALLIUM	mg/L	FIL	0/2	0/2	-		0.002 - .002	ND
THALLIUM	mg/L	UNF	0/1	0/1	-		0.002 - .002	ND
VANADIUM	mg/L	FIL	0/2	0/2	-		0.01 - .01	0.0234
VANADIUM	mg/L	UNF	0/1	0/1	-		0.004 - .004	0.0117
ZINC	mg/L	FIL	0/2	0/2	-		0.0081 - .0169	0.0568
ZINC	mg/L	UNF	1/1	0/1	-	.02 - .02		0.021
1,1,1-TRICHLOROETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
1,1,2,2-TETRACHLOROETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
1,1,2-TRICHLOROETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
1,1-DICHLOROETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
1,1-DICHLOROETHENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
1,2-DICHLOROETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
1,2-DICHLOROETHENE (TOTAL)	ug/L	UNF	0/1	0/1	-		1 - 1	NA
1,2-DICHLOROPROPANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
2-BUTANONE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2-HEXANONE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
4-METHYL-2-PENTANONE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
ACETONE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BENZENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
BROMODICHLOROMETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
BROMOFORM	ug/L	UNF	0/2	0/2	-		1 - 1	NA
BROMOMETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
CARBON DISULFIDE	ug/L	UNF	0/1	0/1	-		1 - 1	NA

000303

TABLE E.2-20
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
CARBON TETRACHLORIDE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
CHLOROBENZENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
CHLOROETHANE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
CHLOROFORM	ug/L	UNF	0/2	0/2	-		1 - 1	NA
CHLOROMETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
CIS-1,3-DICHLOROPROPENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
DIBROMOCHLOROMETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
ETHYLBENZENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
METHYLENE CHLORIDE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
STYRENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
TETRACHLOROETHENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
TOLUENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
TRANS-1,3-DICHLOROPROPENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
TRICHLOROETHENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
TRICHLOROFLUOROMETHANE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
VINYL ACETATE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
VINYL CHLORIDE	ug/L	UNF	0/2	0/2	-		1 - 1	NA
XYLENES, TOTAL	ug/L	UNF	0/1	0/1	-		1 - 1	NA
1,2,4-TRICHLOROBENZENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
1,2-DICHLOROBENZENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
1,3-DICHLOROBENZENE	ug/L	UNF	0/2	0/2	-		1 - 2	NA
1,4-DICHLOROBENZENE	ug/L	UNF	0/2	0/2	-		1 - 2	NA
2,4,5-TRICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2,4,6-TRICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2,4-DICHLOROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2,4-DIMETHYLPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2,4-DINITROPHENOL	ug/L	UNF	0/1	0/1	-		15 - 15	NA
2,4-DINITROTOLUENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
2,6-DINITROTOLUENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
2-CHLOROETHYLVINYL ETHER	ug/L	UNF	1/2	1/2	-	60 - 60	10 - 10	NA
2-CHLORONAPHTHALENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2-CHLOROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2-METHYLNAPHTHALENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
2-METHYLPHENOL	ug/L	UNF	0/1	0/1	-		1 - 1	NA
2-NITROANILINE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
2-NITROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
3-NITROANILINE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
4,6-DINITRO-2-METHYLPHENOL	ug/L	UNF	0/1	0/1	-		15 - 15	NA
4-BROMOPHENYL PHENYL ETHER	ug/L	UNF	0/1	0/1	-		2 - 2	NA
4-CHLORO-3-METHYLPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
4-CHLOROPHENYLPHENYL ETHER	ug/L	UNF	0/1	0/1	-		1 - 1	NA
4-METHYLPHENOL	ug/L	UNF	0/1	0/1	-		1 - 1	NA
4-NITROANILINE	ug/L	UNF	0/1	0/1	-		3 - 3	NA
4-NITROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
ACENAPHTHENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
ACENAPHTHYLENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
ANTHRACENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BENZO(A)ANTHRACENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BENZO(A)PYRENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BENZO(B)FLUORANTHENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BENZO(G,H,I)PERYLENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
BENZO(K)FLUORANTHENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BENZOIC ACID	ug/L	UNF	0/1	0/1	-		20 - 20	NA

TABLE E.2-20
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
BENZYL ALCOHOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BIS(2-CHLOROETHOXY)METHANE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BIS(2-CHLOROETHYL)ETHER	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BIS(2-CHLOROISOPROPYL) ETHER	ug/L	UNF	0/1	0/1	-		2 - 2	NA
BIS(2-ETHYLHEXYL)PHTHALATE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
BUTYL BENZYL PHTHALATE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
CHRYSENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
DI-N-BUTYL PHTHALATE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
DI-N-OCTYL PHTHALATE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
DIBENZO(A,H)ANTHRACENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
DIBENZOFURAN	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DIETHYL PHTHALATE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
DIMETHYL PHTHALATE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
FLUORANTHENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
FLUORENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
HEXACHLOROBENZENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
HEXACHLOROBUTADIENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
HEXACHLOROCYCLOPENTADIENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
HEXACHLOROETHANE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
INDENO(1,2,3-CD)PYRENE	ug/L	UNF	0/1	0/1	-		4 - 4	NA
ISOPHORONE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
N-NITROSO-DI-N-PROPYLAMINE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
N-NITROSODIPHENYLAMINE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
NAPHTHALENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
NITROBENZENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
P-CHLOROANILINE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
PENTACHLOROPHENOL	ug/L	UNF	0/1	0/1	-		2 - 2	NA
PHENANTHRENE	ug/L	UNF	0/1	0/1	-		1 - 1	NA
PHENOL	ug/L	UNF	0/2	0/2	-		2 - 100	NA
PYRENE	ug/L	UNF	0/1	0/1	-		2 - 2	NA
4,4'-DDD	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
4,4'-DDE	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
4,4'-DDT	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
ALDRIN	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
ALPHA-BHC	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
ALPHA-CHLORDANE	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
AROCLOR-1016	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
AROCLOR-1221	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
AROCLOR-1232	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
AROCLOR-1242	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
AROCLOR-1248	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
AROCLOR-1254	ug/L	UNF	0/1	0/1	-		0.1 - .1	NA
AROCLOR-1260	ug/L	UNF	0/1	0/1	-		0.1 - .1	NA
BETA-BHC	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
DELTA-BHC	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
DIELDRIN	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
ENDOSULFAN II	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
ENDOSULFAN SULFATE	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
ENDOSULFAN-I	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
ENDRIN	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
ENDRIN KETONE	ug/L	UNF	0/1	0/1	-		0.01 - .01	NA
GAMMA-BHC (LINDANE)	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
GAMMA-CHLORDANE	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA

000305

TABLE E.2-20
SUMMARY STATISTICS FOR FEMP SOUTH PLUME C TYPE 3 WELLS

PARAMETER	UNITS	FILTERING	FREQUENCY OF DETECTION(1)	FREQUENCY OF DETECTION ABOVE BACKGROUND(2)	MEDIAN(3)	RANGE OF DETECTED RESULTS	RANGE OF NON-DETECT RESULTS	BACKGROUND(4)
HEPTACHLOR	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
HEPTACHLOR EPOXIDE	ug/L	UNF	0/1	0/1	-		0.005 - .005	NA
METHOXYCHLOR	ug/L	UNF	0/1	0/1	-		0.05 - .05	NA
TOXAPHENE	ug/L	UNF	0/1	0/1	-		0.1 - .1	NA
ALKALINITY AS CACO3	mg/L	UNF	1/1	1/1	-	330 - 330		NA
AMMONIA	mg/L	FIL	0/1	0/1	-		0.0001 - .0001	not tested
AMMONIA	mg/L	UNF	1/2	0/2	-	.62 - .62	0.1 - .1	4.2
CHEMICAL OXYGEN DEMAND	mg/L	UNF	1/1	1/1	-	27 - 27		NA
CHLORIDE	mg/L	UNF	2/2	0/2	34	8.67 - 59.3		73
FLUORIDE	mg/L	UNF	2/2	0/2	0.16	.119 - .201		0.89
NITRATE	mg/L	UNF	1/2	0/2	-	.171 - .171	0.1 - .1	11.4
NITRATE, AS NITROGEN	mg/L	UNF	0/2	0/2	-		0.02 - .02	NA
NITRATE/NITRITE	mg/L	UNF	1/1	0/1	-	.21 - .21		4.1
PH		UNF	1/1	1/1	-	7.18 - 7.18		NA
PHENOLS	mg/L	FIL	0/1	0/1	-		0.00001 - .00001	not tested
PHENOLS	mg/L	UNF	1/2	0/2	-	.02 - .02	0.01 - .01	0.03
PHOSPHORUS	mg/L	FIL	1/1	1/1	-	.00969 - .00969		NA
PHOSPHORUS	mg/L	UNF	1/2	1/2	-	10.7 - 10.7	0.02 - .02	NA
SPECIFIC CONDUCTIVITY	umhos/cm	UNF	1/1	1/1	-	1070 - 1070		NA
SULFATE	mg/L	UNF	2/2	0/2	64.8	51.8 - 77.8		197
SULFIDE	mg/L	UNF	0/2	0/2	-		0.5 - .5	NA
TOTAL DISSOLVED SOLIDS	mg/L	UNF	1/1	1/1	-	1000 - 1000		711
TOTAL KJELDAHL NITROGEN	mg/L	UNF	1/2	0/2	-	1.52 - 1.52	0.1 - .1	3.3
TOTAL ORGANIC CARBON	mg/L	UNF	1/2	1/2	-	36.7 - 36.7	1 - 1	2.23
TOTAL ORGANIC HALIDES	mg/L	UNF	1/2	0/2	-	.0368 - .0368	0.01 - .01	0.052
TOTAL ORGANIC HALOGENS	mg/L	UNF	0/2	0/2	-		0.01 - .01	NA
TOTAL ORGANIC NITROGEN	mg/L	UNF	0/2	0/2	-		0.1 - .1	0.9
ACROLEIN	ug/L	UNF	0/1	0/1	-		25 - 25	NA
ACROLEIN	ug/L	UNF	0/1	0/1	-		25 - 25	NA
ACRYLONITRILE	ug/L	UNF	0/1	0/1	-		25 - 25	NA
TRANS-1,2-DICHLOROETHENE	ug/L	UNF	0/2	0/2	-		1 - 1	NA

(1) Statistics are calculated on the "1993 data set." If a frequency of detection is 36/40, then the parameter was tested for in 40 wells, and detected in only 36 of those 40 wells.
(2) If a frequency of detection above background is 12/40, then 12 out of 40 wells tested had concentrations greater than the background concentration value.
(3) Medians were calculated only if a data set had more than one detectable result, and greater than or equal to 50 percent frequency of detection.
(4) BCK = Background concentration value (see Tables E.0-1 and E.0-2).

000306

Appendix F

TABLE OF CONTENTS

List of Tables	vii
List of Figures	x
List of Acronymns	xii
F.1.0 Air Quality Modeling	F.1-1
F.1.1 Objectives	F.1-1
F.1.2 Technical Approach	F.1-1
F.1.2.1 Conceptual Model	F.1-2
F.1.2.2 Meteorological Data	F.1-2
F.1.2.3 Air Dispersion Model	F.1-4
F.1.2.4 Receptor Network	F.1-5
F.1.2.5 Modeling Protocol	F.1-5
F.1.2.5.1 Terrain Description	F.1-5
F.1.2.5.2 Receptor Heights	F.1-6
F.1.2.5.3 Meteorological Data	F.1-6
F.1.2.5.4 Dispersion Options	F.1-6
F.1.2.5.5 Emission Rates	F.1-6
F.1.2.5.6 Variable Emission Rate	F.1-7
F.1.3 Source Term Determination	F.1-8
F.1.3.1 Source areas	F.1-8
F.1.3.1.1 Radiological	F.1-9
F.1.3.1.2 Inorganics	F.1-11
F.1.3.1.3 Organics	F.1-12
F.1.3.1.4 Radon	F.1-12
F.1.3.2 Source Concentrations	F.1-13
F.1.4 Modeling Results	F.1-13
F.1.4.1 Wind Erodible Particulate Modeling Results	F.1-13
F.1.4.2 Radon Modeling Results	F.1-14
F.1.5 Summary	F.1-14
F.1.6 References	F.1-16

TABLE OF CONTENTS
(continued)

F.2.0 Surface Water Transport Model F.2-1

F.2.1 Introduction F.2-1

F.2.1.1 Objectives F.2-1
F.2.1.2 General Surface Hydrological Conditions F.2-2

F.2.2 Technical Approach F.2-4

F.2.2.1 Conceptual Model F.2-4

F.2.2.1.1 Rainfall and Runoff F.2-4
F.2.2.1.2 Infiltration Through the Streambeds F.2-4
F.2.2.1.3 Contaminant Transport F.2-6
F.2.2.1.4 Major Assumptions of the Surface Water Model F.2-7

F.2.2.2 Model Framework and Approach F.2-8
F.2.2.3 Surface Water Flow and Infiltration Model Summary Report F.2-9
F.2.2.4 Contaminant Transport Model F.2-11

F.2.2.4.1 Sediment Generation F.2-11
F.2.2.4.2 Partitioning Equations F.2-12
F.2.2.4.3 Estimation of Concentrations in Runoff in Paddys Run, SSOD, and the Great Miami River F.2-13
F.2.2.4.4 Contaminant Loadings to the Great Miami Aquifer F.2-20

F.2.3 Contaminant Loading Determination F.2-24

F.2.3.1 Contaminant Source Areas and Concentrations F.2-25
F.2.3.2 Geochemical Parameters F.2-26
F.2.3.3 CPC Screening in the Surface Water Pathway F.2-28

F.2.3.3.1 Initial Toxicity Screening F.2-28
F.2.3.3.2 Surface Water CPC Screening F.2-29
F.2.3.3.3 Groundwater CPC Screening F.2-29

F.2.4 Modeling Results F.2-31

F.2.4.1 Paddys Run Drainage Baseline Conditions F.2-32
F.2.4.2 Paddys Run Drainage Future Conditions F.2-33
F.2.4.3 Northeast Drainage Ditch F.2-34

000308

TABLE OF CONTENTS
(continued)

F.2.5 Model Performance Evaluation F.2-35

F.2.5.1 Current Contaminant Source Terms F.2-35
F.2.5.2 Simulated Current Surface Water Concentrations F.2-36
F.2.5.3 Simulated Current Sediment Concentrations F.2-37
F.2.5.4 Simulated Surface Water Contaminant Loadings to the Great Miami Aquifer F.2-38

F.2.6 Sensitivity Analysis F.2-40

F.2.6.1 SCS Curve Number Sensitivity Analysis F.2-41
F.2.6.2 Precipitation Sensitivity Analysis F.2-41
F.2.6.3 Sensitivity Analysis of the Soil/Water Partitioning Coefficient (K_d) F.2-42
F.2.6.4 Summary of Sensitivity Analyses F.2-42

F.2.7 Summary F.2-43

F.2.8 References F.2-46

F.3.0 Groundwater Fate And Transport Modeling F.3-1

F.3.1 Introduction F.3-1

F.3.1.1 Modeling Domain F.3-1

F.3.2 Hydrogeologic Conditions And Conceptual Model For The Groundwater Pathways F.3-2

F.3.2.1 General Groundwater Hydrogeological Conditions F.3-2
F.3.2.2 Conceptual Model F.3-4
F.3.2.3 Conceptual Model for Infiltration Rate Calculation and Screening F.3-6

F.3.3 Technical Approach F.3-6

F.3.3.1 Groundwater Fate and Transport Modeling Approach F.3-7
F.3.3.2 Modeling Framework F.3-9
F.3.3.3 Groundwater Fate and Transport Model Descriptions F.3-11

F.3.3.3.1 HELP Model Description F.3-11
F.3.3.3.2 ODAST/SWIFTLOAD Model Description F.3-12
F.3.3.3.3 GO/UGMAS Model Description F.3-14
F.3.3.3.4 SWIFT Great Miami Aquifer Model Description F.3-16
F.3.3.3.5 ECTran Model Description F.3-19

TABLE OF CONTENTS
(continued)

F.3.4	Contaminant Loading Determination	F.3-20
F.3.4.1	Primary and Secondary COPCs	F.3-21
F.3.4.2	Surface Soil Contamination Source Areas, Concentrations, and Inventories	F.3-21
F.3.4.3	Determination of Geochemical Parameters and Source Leachate of Contaminated Soil	F.3-23
F.3.4.4	Surface Water Loadings	F.3-27
F.3.4.5	Current Contamination in Perched Groundwater	F.3-29
F.3.4.6	Current Contamination in the Great Miami Aquifer	F.3-30
F.3.5	Simulation Of Vadose Zone To Great Miami Aquifer Pathway	F.3-32
F.3.5.1	Determination of Infiltration Rate	F.3-32
F.3.5.2	CPC Screening	F.3-34
F.3.5.3	Vadose Zone Modeling	F.3-38
F.3.5.4	Great Miami Aquifer Modeling	F.3-40
F.3.5.4.1	SWIFT Modeling	F.3-40
F.3.5.4.2	ECTran Modeling	F.3-41
F.3.6	Simulation Of Perched Groundwater To Surface Water Pathway	F.3-45
F.3.6.1	Evaluation of Lateral Migration of Contaminants in Perched Groundwater	F.3-45
F.3.6.2	Contaminant Source Areas and Expected Exposure Points	F.3-47
F.3.6.3	CPC Screening	F.3-47
F.3.7	Modeling Results	F.3-48
F.3.7.1	SWIFT Great Miami Aquifer Model	F.3-48
F.3.7.2	ECTran Model	F.3-52
F.3.8	Model Performance Evaluation	F.3-53
F.3.8.1	Verification of Aquifer Loadings in Operable Units 1, 2, and 4 RI Modeling	F.3-54
F.3.8.2	Solute Transport Calibration	F.3-54
F.3.8.3	Uncertainty/Sensitivity Analysis of the Great Miami Aquifer Model	F.3-56
F.3.8.4	Uncertainty Analysis of Uranium K_l and K_d	F.3-58
F.3.9	References	F.3-61

000310

TABLE OF CONTENTS
(continued)

Attachments:

F.3.I Historical Airborne Release Of Uranium And Geochemical Concepts Of The Subsurface Uranium Distribution At The Fernald Site

F.3.II Zonation And Values Of Geochemical Parameters For Fate And Transport Modeling

Appendices:

F.3-II-A Perched Water Concentrations, Soil Concentrations, And Production Area K_l and K_d Calculations

F.3-II-B OU4 Batch Test Results

F.3-II-C OU5 Batch Test Results

LIST OF TABLES

Table	Title
F.1-1	Composite Mixing Heights* In Meters Used In ISCLT Modeling For FEMP
F.1-2	Composite Ambient Air Temperature In Degrees Kelvin, Used In ISCLT Modeling For FEMP
F.1-3	Dispersion Options Used In ISCLT Modeling, Of Operable Unit 5 For FEMP
F.1-4	Radiological Source Coordinates, Used In ISCLT2 Air Transport Modeling For Operable Unit 5
F.1-5	Inorganic Source Coordinates, Used In ISCLT2 Air Transport Modeling For Operable Unit 5
F.1-6	Organic Source Coordinates, Used In ISCLT2 Air Transport Modeling For Operable Unit 5
F.1-7	Radon Source Coordinates, Used In ISCLT2 Air Transport Modeling For Operable Unit 5
F.1-8	Maximum Annual Average Concentrations, At On Property Receptors, (Current Scenario)
F.1-9	Maximum Annual Average Concentrations, At Off Property Receptors, (Current Scenario)
F.1-10	Maximum Annual Average Concentrations, At Discrete Receptors, (Current Scenario)
F.1-11	Maximum Annual Average Concentrations, At On Property Receptors, (Agricultural Scenario)
F.1-12	Maximum Annual Average Concentrations, At Off-property Receptors, (Agricultural Scenario)
F.1-13	Maximum Annual Average Concentrations, At Discrete Receptors, (Agricultural Scenario)
F.1-14	Comparison Of Radon Concentrations, At Air Monitoring Stations To, ISCLT Model Results At Same Locations
F.2.2-1	Major Components Of The Surface Water, Flow And Infiltration Model
F.2.2-2	Comparison Of Modeled And Measured Increase Of, Paddys Run Flow Depths
F.2-2-3	Data From HEC-1
F.2.2-4	Parameters Used In Surface Water Model
F.2.2-5	Summary Of Subbasin And Reach-specific Infiltration Results In Paddys Run
F.2.2-6	Summary Of Infiltration Results, In The Storm Sewer Outfall Ditch (SSOD)
F.2.3-1	Fate And Transport Parameters Of Radionuclide Constituents
F.2.3-2	Fate And Transport Parameters Of Inorganic Constituents
F.2.3-3	Surface Soil Parameters Used To Calculate K_l/K_d
F.2.3-4	Fate And Transport Parameters Of Organic Constituents
F.2.3-5	Initial Toxicity Screening
F.2.3-6	Constituents Of Potential Concern Screening Results, In The Surface Water Pathway, Baseline Condition
F.2.3-7	Constituents Of Potential Concern Screening Results, In The Surface Water Pathway, Future Condition

000312

LIST OF TABLES
(continued)

F.2.4-1 Summary of Predicted Concentrations of Constituents of Potential Concern in Sediment, Baseline Condition
F.2.4-2 Summary of Predicted Concentrations of Constituents of Potential Concern in Surface Water, Baseline Condition
F.2.4-3 Summary of Predicted Concentrations of Constituents of Potential Concern in the Great Miami Aquifer Along Paddys Run, Baseline Condition
F.2.4-4 Summary of Predicted Loading of Concentrations of Constituents of Potential Concern Through Paddys Run and the Storm Sewer Outfall Ditch Into the Great Miami Aquifer, Baseline Condition
F.2.4-5 Summary of Predicted Concentrations of Constituents of Potential Concern in Sediment, Future Condition
F.2.4-6 Summary of Predicted Concentrations of Constituents of Potential Concern in Surface Water, Future Condition
F.2.4-7 Summary of Predicted Concentrations of Constituents of Potential Concern in the Great Miami Aquifer Along Paddys Run, Future Condition
F.2.4-8 Summary of Predicted Loading of Concentrations of Constituents of Potential Concern Through Paddys Run and the Storm Sewer Outfall Ditch Into the Great Miami Aquifer, Future Condition
F.2.4-9 Surface Water Modeling Results for the Northeast Drainage Ditch

F.2.5-1 Comparison of Modeled and Sampled Total Uranium Concentrations in Surface Waters
F.2.5-2 Comparison of Modeled and Sampled Total Uranium Concentrations in Sediments
F.2.5-3 Comparison of Modeled and Sampled Total Uranium Concentrations in Great Miami Aquifer Near Paddys Run and SSOD

F.2.6-1 Results of the Curve Number and Precipitation Sensitivity Analyses
F.2.6-2 Results of the Soil/Water Partitioning Coefficient Sensitivity Analysis

F.3.4-1 Operable Unit 5 Detected Constituents
F.3.4-2 General Physical and Chemical Condition of Conceptual Operable Unit 5 Contaminant Source Areas
F.3.4-3 Source Concentrations and Inventories in the Groundwater Pathway, Vertical Migration
F.3.4-4 Fate and Transport Parameters of Constituents Considered in Modeling
F.3.4-5 General Physical and Chemical Conditions of Operable Unit 5, Contaminant Source Areas and Migration Media
F.3.4-6 Summary of Predicted Loading of CPCs Through Paddys Run and SSOD into the Great Miami Aquifer, Baseline and Future Conditions
F.3.4-7 Summary of Surface Water Loading Concentrations to the GMA, Surface Water as a Source
F.3.4-8 Source Concentrations and Inventories in the Groundwater Pathway, Initial Great Miami Aquifer Conditions
F.3.4-9 Surface Soil Source Areas for Secondary CPCs Modeled by ECTran, Surface Soil to GMA Pathway
F.3.4-10 Hydrogeologic Data Used for Modeling Secondary CPCs with ECTran, Surface Soil to GMA Pathway

LIST OF TABLES
(continued)

F.3.5-1	HELP Modeling Parameters and Results
F.3.5-2	Results of Vadose Zone to Great Miami Aquifer Pathway Screening
F.3.5-3	General Physical Conditions of Operable Unit 5 Infiltration Zones and Calculated Parameters Used in Operable Unit 5 Travel Time Screening
F.3.5-4	SWIFTLOAD Screening Results
F.3.5-5	Constituents of Potential Concern and Modeling Approach
F.3.5-6	Hydrogeological Information for the ECTran Model, Surface Water as a Source
F.3.6-1	Hydrogeologic Information for the ECTran Model, Perched Water as a Lateral Source
F.3.6-2	Summary of Perched Water Plume Characteristics, Perched Water as a Lateral Source
F.3.7-1	Constituents of Potential Concern in the Groundwater Pathway and Modeling Approaches
F.3.7-2	Summary of Times, Locations, and Maximum Mass Loading for Constituents of Potential Concern to the Great Miami Aquifer
F.3.7-3	Summary of Time, Locations, and Maximum Concentrations of Primary Constituents of Concern in the GMA, On Site and Off Site
F.3.7-4	OU5 Receptor Concentrations at Time of Uranium-Total Maximum Concentration
F.3-7-5	Maximum ECTran Concentrations for Surface Soil as Source
F.3.7-6	Maximum ECTran Concentrations for Surface Water as a Vertical Source
F.3.7-7	CPC Maximum Concentrations at Pilot Plant Ditch/Paddys Run, Perched Water as a Lateral Source
F.3.7-8	Screening for Perched Water Impacts to Surface Water
F.3.8-1	Summary of Estimated Range and Distribution of Model Parameters
F.3.8-2	Summary of ECTran Model Monte Carlo Results
F.3.8-3	Simulations for SWIFT Model Sensitivity Analysis
F.3.8-4	Maximum Grid and Fenceline Concentrations
F.3.8-5	Time of Arrival and Concentrations at the East and South Boundaries
F.3.8-6	Uncertainty Analysis of Kd for Uranium-Total, Cases 1 and 2
F.3.8-7	Uncertainty Analysis of Kd for Uranium-Total, Baseline Case and Case 3

000314

LIST OF FIGURES

Figure	Title
F.3.1-1	Modeling Domain
F.3.1-2	Overall Operable Unit 5 Surface Source Area
F.3.1-3	OU5 Risk Assessment Zones and Receptors in the Groundwater Pathway
F.3.2-1	Conceptual Model of Contaminant Transport by Groundwater at the FEMP
F.3.2-2	Groundwater Fate and Transport Modeling Infiltration Zones
F.3.2-3	Groundwater Fate and Transport Modeling Conceptual Model Zones - Generalized Cross Section
F.3.3-1	Analytical and Numerical Models Used to Represent Contaminant Transport Processes
F.3.3-2	Groundwater Models and Modeling Procedure
F.3.4-1	Contaminant Source Areas
F.3.4-2	Zones of Uranium K_1/K_d Values
F.3.4-3	Source Leachate Concentration Estimation
F.3.4-4	Typical Contaminant Migration Pathways from Surface Water Sources to Potential OU5 Receptors
F.3.4-5	Development of Initial Uranium Concentrations
F.3.4-6	Initial Concentration of U-Total for Swift GMA Modeling (Layer 1)
F.3.4-7	Initial Concentration of U-Total for Swift GMA Modeling (Layer 2)
F.3.4-8	Initial Concentration of U-Total for Swift GMA Modeling (Layer 3)
F.3.4-9	Initial Concentration of NP-237 for SWIFT GMA Modeling
F.3.4-10	Initial Concentration of RA-226 for SWIFT GMA Modeling
F.3.4-11	Initial Concentration of TC-99 for SWIFT GMA Modeling
F.3.4-12	Initial Concentration of Arsenic for SWIFT GMA Modeling
F.3.4-13	Initial Concentration of Manganese for SWIFT GMA Modeling
F.3.4-14	Initial Concentration of Antimony for SWIFT GMA Modeling
F.3.5-1	Constituent Screening Process-Groundwater Pathway
F.3.5-2	Conceptual Model for Contaminant Loading from Surface Soil to the Great Miami Aquifer
F.3.5-3	Conceptual Model for Contaminant Loading from Surface Water to the Great Miami Aquifer
F.3.6-1	Coarse-grained Sediment Lens
F.3.6-2	Conceptual Model for Lateral Contaminant Loading from Perched Water to Surface Water
F.3.6-3	Perched Groundwater Contours
F.3.6-4	Perched Water as a Lateral Source to Surface Water
F.3.7-1	Concentrations of Uranium-Total in the GMA at 70 Years
F.3.7-2	Loading and Breakthrough Concentration for U-Total in the Maximum Loading Model Block
F.3.7-3	Location of Risk Zone Specific Maximum Uranium Loadings

LIST OF FIGURES
(continued)

F.3.7-4	Area Specific Maximum Uranium-Total Loading Curve
F.3.7-5	Concentrations of Radium-226 in the GMA at 1000 years (FEMP Maximum)
F.3.7-6	Concentrations of Radium-226 in the GMA at 1000 years (Fenceline Maximum)
F.3.7-7	On-Property Area-Specific Maximum Uranium Concentrations versus Time
F.3.7-8	Concentrations of Key Constituents versus Time at Receptor Well 12
F.3.7-9	Concentrations of Key Constituents versus Time at Receptor Well 13
F.3.7-10	Concentrations of Key Constituents versus Time at Receptor Well 14
F.3.7-11	Concentrations of Key Constituents versus Time at Receptor Well 2119
F.3.7-12	Concentrations of Key Constituents versus Time at Receptor Well 2071
F.3.7-13	Concentrations of Key Constituents versus Time at Receptor Coll 1
F.3.7-14	Concentrations of Key Constituents versus Time at Receptor Coll 2
F.3.7-15	Concentrations of Uranium-Total in the GMA at 210 Years (Fenceline Maximum)
F.3.7-16	Concentrations of Uranium-Total in the GMA at 1000 Years
F.3.7-17	Maximum Extent of Uranium-Total Contamination
F.3.7-18	Surface Soil Loading Area and Flow Paths (Carbazole)
F.3.7-19	Surface Soil Loading Area and Flow Paths (Alpha-chlordane)
F.3.7-20	Surface Soil Loading Area and Flow Paths (Mercury)
F.3.7-21	Surface Soil Loading Area and Flow Paths [Bis(2-chloroisopropyl)ether]
F.3.7-22	Surface Soil Loading Area and Flow Paths (Bromodichloromethane)
F.3.8-1	Uranium-Total K_1/K_d Uncertainty Analysis, Case 1, Plume with the Maximum On-Site Concentration (800 Years)
F.3.8-2	Uranium-Total K_1/K_d Uncertainty Analysis, Case 2, Plume with the Maximum On-Site Concentration (980 Years)
F.3.8-3	Uranium-Total K_1/K_d Uncertainty Analysis, Case 3, Plume with the Maximum On-Site Concentration
F.3.8-4	Uranium-Total K_1/K_d Uncertainty Analysis, Case 3, Plume with the Maximum Fenceline Concentration

000316

LIST OF ACRONYMS

BNL	Brookhaven National Laboratory
CDC	Centers for Disease Control
COC	constituent of concern
COPC	constituent of preliminary concern
CPC	constituent of potential concern
DC	detected constituent
DOE	U.S. Department of Energy
EM	Environmental Monitoring [Program]
EPA	U.S. Environmental Protection Agency
ERMA	Environmental Resource Management and Analysis Systems
FEMP	Fernald Environmental Management Project
FOC	fractional organic carbon
FS	feasibility study
GIS	geographical information system
GO/UGMAS	Glacial Overburden/Upper Great Miami Aquifer System [model]
gpm	gallons per minute
HELP	Hydraulic Evaluation of Landfill Performance [model]
HQ	hazard quotient
ISCLT2	Industrial Source Complex Long Term 2 [version 93109 model]
MCL	Maximum Concentration Level
MUSLE	modified universal soil loss equation
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NWS	National Weather Service
ODAST	One-Dimensional Analytical Solute Transport [model]
ORNL	Oak Ridge National Laboratory
RAC	Radiological Assessment Corp.
RAGS	Risk Assessment Guidance for Superfund
RI	remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
RMI	Reactive Metals, Inc.
SCS	Soil Conservation Service
SI	saturation index
SSOD	storm sewer outfall ditch
STAR	stability array
SWF&IM	Surface Water Flow and Infiltration Model
SWIFT	Sandia Waste Isolation Flow and Transport [model]
TFV	threshold friction velocity
UAP	uranyl ammonium phosphate
UCL	upper confidence limit
UNH	uranyl nitrate hexahydrate
USLE	universal soil loss equation
WMCO	Westinghouse Materials Company of Ohio

6161

F.1 Air Modeling

F.1.0 AIR QUALITY MODELING

F.1.1 OBJECTIVES

As part of the baseline risk assessment for Operable Unit 5 of the Fernald Environmental Management Project (FEMP), an analysis of the transport of contaminants through the air pathway was conducted to estimate its impact on the environment. This section describes the methods used and the results of the analysis.

The objective of the air pathway analysis was to determine maximum annual concentrations at receptors located within the FEMP boundary (on-property), at or beyond the FEMP boundary (off-property), and at discrete receptors. Annual concentration calculations were based on air dispersion modeling that used on-property meteorological data and the resuspension of erodible surface soil particles and the release of radon gas from individual source terms. The wind erosion potential for each subunit was dependent on surface soil conditions, vegetative cover, meteorological conditions and conceptual model scenarios. Radon gas potential was dependent on radium-226 activity levels in surface soil.

F.1.2 TECHNICAL APPROACH

The technical approach required several steps in order to determine airborne contaminant concentrations. The first step included the identification of contaminant sources of Operable Unit 5 and the quantification of source terms. Next, a conceptual model was developed which identified exposure points that would be at risk from airborne contaminants through an air pathway. Once identified, a U.S. Environmental Protection Agency (EPA) regulatory air dispersion model was selected that would estimate concentrations from a defined source to an exposure point via the air pathway. Whenever possible, on-site data was used in the air dispersion modeling process. However, when on-site data was not available, conservative assumptions were made so as not to underestimate the impact on air quality from Operable Unit 5 sources. A receptor grid was generated in accordance with protocol established by the Risk Assessment Work Plan Addendum (DOE 1992) and subsequent supplemental guidance issued as draft policies, and incorporated suggested exposure point locations defined in the conceptual model. Emission rates were calculated in accordance with current and future land-use conditions of the FEMP facility and with EPA guidelines described in

"Rapid Assessment of Exposure to Particulate Emission from Surface Contamination Sites" (EPA 1985).

F.1.2.1 Conceptual Model

The purpose of the conceptual model is to identify exposure points that would be susceptible to airborne contaminants through an air pathway. Essentially, maximum on- and off-property concentrations were calculated through air dispersion modeling which accounts for inhalation and ingestion effects on these exposure points.

288 The conceptual model assumed two land-use scenarios, current and agricultural. The current land-use scenario assumed that a reasonable vegetative cover of 85 percent exists over the present surface soil areas not covered by buildings, concrete, asphalt or gravel. The vegetative cover of 85 percent was established in supplemental risk guidance, "Particulate Dispersion Modeling," and was based on current land-use conditions at the facility. The model assumes no remediation of Operable Unit 5 has taken place. In the agricultural scenario, a 50 percent vegetative cover was used to describe future land-use conditions. The 50 percent vegetative cover was also established in "Particulate Dispersion Modeling," and was based on an agricultural land-use scenario which assumes the facility will be used for farming practices in the future.

F.1.2.2 Meteorological Data

289 Five meteorological parameters: wind speed, wind direction, ambient air temperature, atmospheric stability and vertical mixing heights were used as input for the air quality modeling of Operable Unit 5. All parameters, with the exception of vertical mixing heights, are measured directly at the FEMP's on-site meteorological tower. Vertical mixing heights were calculated from atmospheric sounding data. This data was collected by a radio transmitter (radiosonde) tethered to a hydrogen or helium filled balloon. Radiosondes were launched from the National Weather Service (NWS) office in Dayton, Ohio, twice a day and measured the vertical profile of temperature, dewpoint, barometric pressure, wind direction and wind speed at preselected levels during its ascent through the atmosphere. This information was recorded at the launch site by tracking receivers. From this information, vertical mixing heights (height of atmosphere which air parcels with greatest height exchange with those closest to the ground) were calculated and used in air quality modeling (see Table F.1-1). The NWS office in Dayton was selected because it was the closest source of

000319

atmospheric sounding data to the FEMP facility. It was assumed that atmospheric conditions recorded at the NWS Dayton office would best represent the conditions at the FEMP facility.

Wind speed, wind direction and ambient air temperature data are measured at the FEMP meteorological tower at a height of 10 meters. The atmospheric stability category is derived from direct measurements of the standard deviation of the horizontal wind direction (sigma-theta) during the daytime and the low-level temperature difference (delta-T) at night. These procedures are in accordance with EPA methods for estimating Pasquill stability categories in terms of the standard deviation of the horizontal wind direction and low-level temperature differences (EPA 1987). The temperature difference is calculated from air temperature recorded at the 60- and 10-meter levels.

The ambient air temperatures measured at the FEMP meteorological tower and the temperatures used in the air dispersion modeling as a function of atmospheric stability categories A through F are given in Table F.1-2. Assignments of temperatures to stability categories were made in accordance with EPA recommendations (1992a). These recommendations suggest that the annual average maximum daily temperatures be assigned to the A, B, and C stability categories; annual average temperature be assigned to the D stability category; and annual average minimum daily temperature be assigned to the E and F categories.

The format of the meteorological data required by the Industrial Source Complex Long-Term Version 93109 (ISCLT2) model is in the form of the STability ARray (STAR) program output. The STAR program output is a statistical meteorological data summary which gives the joint frequency distribution of six wind-speed classes by 16 wind sectors (i.e., north, north-northeast, northeast, etc.,) by six atmospheric stability categories (A through F). The STAR data used in the air dispersion modeling for Operable Unit 5 was a composite of five years of on-site meteorological data from 1987 through 1989, 1991 and 1992. The 1990 annual period was not used because of an unacceptable data recovery rate.

The six wind-speed classes are defined as 1 to 3 miles per hour (mph); 4 to 7 mph; 8 to 12 mph; 13 to 18 mph; 19 to 24 mph; and greater than 24 mph. Calm winds are wind speeds less than 1 mph with a variable wind direction. To account for the calm winds measured at the FEMP meteorological tower, the frequency of occurrence of calm winds were equally divided among the 16 wind direction sectors and added to the 1 to 3 mph wind-speed class.

According to meteorological wind data measured and recorded at FEMP facility, the prevailing wind direction blows from the west-southwest to the east-northeast.

F.1.2.3 Air Dispersion Model

Annual average concentrations were determined by the EPA's computerized air dispersion model, ISCLT2. This model was recommended for use by the U.S. Department of Energy (DOE) in the Risk Assessment Work Plan Addendum (DOE 1992). Another air dispersion models that was applicable to the air transport analysis of Operable Unit 5 was EPA's Fugitive Dust Model. However, a major limitation to this model is its inability to compute concentrations at receptors greater than 500 per run, whereas, ISCLT2 can compute concentrations at 10,000 grid and discrete receptors. Since the total number of receptors used in the Operable Unit 5 air dispersion modeling was 5293, ISCLT2 was selected as the most appropriate air dispersion model to use.

The ISCLT2 model was designed by the EPA for assessing the air quality impact of emissions at user-selected receptors from a variety of sources. It incorporates a steady-state Gaussian plume equation that is applicable for flat or gently rolling terrain. The ISCLT2 model calculates annual average concentrations due to airborne emissions at user-selected receptors, based on sector averaged statistical wind summaries known as STAR. The user is required to select from single or multiple point, area or volume sources as input to the model. Input data also includes emission rates from the sources; location and configuration of sources; statistical summaries of wind speed, wind direction and atmospheric stability; and locations of receptors of interest. Other input options used in the modeling are shown in Table F.1-3.

The ISCLT2 model defines sources as any point(s), area or volume that have the potential to emit emissions. Due to the configuration of the Operable Unit 5 sources, the "area source" designation was selected to best represent the source types.

One limitation of the ISCLT2 model is its inability to calculate ground-level concentrations from irregularly shaped area sources. Therefore, the user is required to break down each irregularly shaped source into a series of squares that would best approximate the square area of that source (EPA 1992a). Section F.1.3 describes in detail the procedure for defining the source areas. Figures F.1-1 through F.1-4 illustrate the breakdown of source squares for the four classification of sources.

Tables F.1-4 through F.1-7 list the coordinates of the source squares for each contaminant class evaluated in the Operable Unit 5 air dispersion modeling process.

F.1.2.4 Receptor Network

A receptor is defined as a user-selected point at a given distance from a source or origin. On- and off-property receptors are determined by the fenceline surrounding the FEMP facility. A series of receptors around a source is commonly referred to as a "receptor grid" and may be expressed in polar or Cartesian coordinates.

The air pathways analysis for Operable Unit 5 used a 86 x 61 receptor grid (i.e., the number of receptors along the north-south axis and the number of receptors along the east-west axis) with 50-meter spacing between each receptor. The origin of the receptor grid was located at State Planar Coordinates; 482,752.690 feet (north) and 1,376,778.760 feet (east) and 578.941 feet (elevation) (see Figure F.1-5).

Discrete receptors were used in the air transport analysis to calculate for concentrations at sensitive locations. Discrete receptors consisted of Crosby, Morgan, Elda, and St. John's Elementary Schools, Ross Country Day Nursery School, Ross Middle and High Schools, Knollman dairy farm, two locations east and south of the FEMP along the Great Miami River, one along Paddys Run Road and one near the Village of Fernald. These sensitive receptors are illustrated in Figure F.1-6.

F.1.2.5 Modeling Protocol

The air quality modeling protocol used for risk assessment studies at the FEMP facility is outlined in the draft Particulate Dispersion Modeling policy. Some of the factors addressed in the modeling protocol were terrain description, receptor heights, meteorological data and dispersion options. Not listed in the protocol are the methods by which to calculate emission factors and radon flux rates; these are described in Section F.1.3.

F.1.2.5.1 Terrain Description

Terrain description at the FEMP facility was based on site visits and a survey of U.S. Geological Survey topographic maps (Southeast Quadrangle, revised 1981) which show the topographic characteristics surrounding the FEMP facility to be generally flat.

F.1.2.5.2 Receptor Heights

Ambient air concentrations were estimated at receptors with heights of 1.5 meters (flagpole receptors). This flagpole receptor height simulates the risk of inhaling respirable particulates (particle diameters less than 10 μm) through the mouth or nose.

F.1.2.5.3 Meteorological Data

Whenever possible, on-site meteorological data was used in the air dispersion modeling. This data consisted of ambient temperatures and STAR data which incorporate frequency of wind speed direction with stability classes. Due to the lack of proper equipment at the FEMP, upper air meteorological data used to calculate mixing heights was obtained from the NWS in Dayton.

F.1.2.5.4 Dispersion Options

Dispersion options are internal switches inherent to the ISCLT2 model. These switches account for source type, type of receptor grid, averaging period for meteorological input, averaging period and calculation mode. Table F.1-3 summarizes the dispersion options used in the ISCLT2 modeling of Operable Unit 5 sources.

F.1.2.5.5 Emission Rates

Wind erosion emission rates were calculated according to methods described in Rapid Assessment of Exposure to Particulate Emission from Surface Contamination Sites (EPA 1985b). Emission rate calculations were based on the erosion potential of surface soil particles of each source, except for radon sources. The wind erosion emission rate for a source is defined as either having "unlimited" or "limited" potential. Essentially, sources that have continuous vegetation growth or where surface soil has crusted are classified as having limited erosion potential. Conversely, surface soil that is loose, fine or sandy has a high potential for erodibility and is classified as having an unlimited erosion potential. In the air dispersion modeling for Operable Unit 5, emission rates were calculated using procedures applicable to both limited (applicable to current scenario conditions) and unlimited (applicable to agricultural scenario conditions) erosion methods because the conceptual model suggests an 85 and 50 percent vegetative cover, respectively. Emission rate calculations are found in Attachment F.1.I.

Because radon is a gas it does not adhere to soil particles similar to the other contaminants examined. Therefore, it is not emitted from a source by the same methods described above for wind erosion.

000323

Instead of calculating wind erosion emission rates, separate flux rates were calculated for radon. Flux rates were determined in accordance with methods described in the Nuclear Regulatory Commission (NRC) publication, Radon Attenuation Handbook for Uranium Mill Tailing Cover Design (NRC 1984).

The following equation was used to calculate radon flux rates from bare soil. It shows the relationship between radium concentration and flux rates.

$$J_t = 10^4 R \rho_t E (\lambda DC_t)^{1/2} \tanh(\lambda / DC_t)^{1/2} \chi_t$$

where:

R	=	radium concentration (pCi/g)
ρ_t	=	dry bulk density (g/cm^3)
E	=	radon emanation coefficient (unitless)
λ	=	radiological decay constant for radon (sec^{-1})
DC_t	=	radon diffusion coefficient (cm^2/s)
x^t	=	thickness of tailings (cm)

Flux rate calculations for all radon sources relative to Operable Unit 5 can be found in Attachment F.1.II.

290 F.1.2.5.6 Variable Emission Rate

It has been demonstrated through EPA wind tunnel experiments that the wind speed at which wind erosion begins (threshold friction velocity) is dependent on modal diameter of the soil (EPA 1985a). It was determined that the soil at the site has a modal diameter of 59 microns (see Attachment F.1-III). This results in a threshold friction velocity of 0.2 m/s at a roughness height of 1 cm (see Attachment F.1-II). Interpolating this wind speed to a height of 7 meters, using the power law equation, increases the wind speed to 3.27 m/s. Therefore, model calculations for the resuspension of surface soil particles assumed emissions to only occur when the surface wind speed equaled or exceeded 3.27 m/s.

F.1.3 SOURCE TERM DETERMINATION

F.1.3.1 Source areas

Operable Unit 5 source areas were defined into four classifications: radiological, inorganics, organics and radon. Each classification, except for radon, consisted of a list of site-specific contaminants of concern (COC). Analytes which showed the highest frequency of occurrence in soil were selected from each COC list to initially define source areas. For example, within the classification of radiological analytes, uranium-238 appeared in many of the soil samples analyzed. It was therefore assumed that the area of contamination of all other radiological analytes are of equal or lesser area than uranium-238. Once an analyte was selected to represent the distribution of other analytes in that classification, a screening level was determined for that analyte.

291 Methods of determining screening levels differ from classification to classification. For example, screening levels for radiological analytes were based on a value of 50 mg/kg for total uranium in soil established by the NRC, EPA and DOE (WMCO 1988, 1990). Inorganic and organic screening levels were derived by methods described in Risk Assessment Guidance for Superfund (RAGS), Vol. 1 (EPA 1991) and modified with commercial and industrial equations to account for an inhalation pathway. The radon screening level was derived from the "Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954," Subpart D, Section (2)i (EPA 1993).

After a representative analyte and corresponding screening level have been identified for each classification (i.e. radiological, inorganics, organics and radon), the extent of contamination surrounding each soil sample was estimated. No quantitative value or procedure exists that relates the degree of contamination to the extent of contamination around a sample. Therefore, it was assumed that 960 square meters (31 meters per side) surrounded each soil sample that exceeded screening levels. This assumption was based on the minimum distance needed so that one area of contamination around a sample would meet but not overlap another area of contamination.

Those samples with areal contamination assumed around them were then grouped. This grouping was first by concentrations and then by location with other samples. For example, if four samples all had the same concentration and were collocated, the samples were grouped into a single square with a total area equal to the four individual areas combined. Conversely, if a sample had a significantly higher concentration than those surrounding it, the sample was analyzed as a single source with a

minimum area of contamination of 960 square meters. These source squares for each classification are illustrated in Figures F.1-1 through F.1-4.

F.1.3.1.1 Radiological

Analyzed surface soil samples and borings taken at the FEMP facility revealed that uranium-238 had the highest frequency of occurrence of all the radionuclides. Therefore, uranium-238 was chosen to represent the extent of contamination of all radiological analytes. Examination of the surface soil data revealed that in general, areas with high in-soil uranium-238 concentrations also showed high concentrations of other radiological analytes.

Because the areal coverage of uranium-238 is so large, screening levels were developed to identify significant areas of contamination. Because of the variability in the amount of natural uranium found around the FEMP facility, no single background value or screening level had been established. However, EPA and DOE had agreed upon 50 mg/kg as an acceptable level for total uranium to begin cleanup activities (WMCO 1988, 1990). However, the 50 mg/kg accounts for total uranium by mass and must be converted to an activity level in pCi/g for uranium-238. Conversion from mass of natural uranium to activity of uranium-238 is described in the following procedures.

The conversion of mass to activity requires use of the fundamental relationship between the number of radioactive atoms, which is related to mass, and the radioactive decay constant:

1. Number of atoms in a given mass of uranium:

$$N_i = \frac{M \times 10^{-3}\ g/mg \times f_i \times 6.0221367 \times 10^{23}\ atoms/mole}{MW}$$

where:

M	=	mass of constituent of interest (mg)
N_i	=	number of atoms in "M" milligrams of sample for a particular nuclide "i."
f_i	=	isotopic fraction for a particular nuclide "i," atom percent/100.
6.0221367×10^{23}	=	Avogadro's number, atoms/mole.
MW	=	gram atomic weight.
	=	238.0289 grams/mole for natural uranium.

000326

2. Activity from number of atoms in pCi:

$$A_i = \frac{\lambda N_i}{3.7 \times 10^{10}\ (atoms/sec)\ /\ (Ci \times 10^{-12}\ Ci/pCi)}$$

where:

A_i = activity in pCi for a particular radionuclide "i."
λ = radioactive decay constant, second^{-1}

$$= \frac{\ln^2}{T_{1/2}}$$

$T_{1/2}$ = radioactive half-life, seconds
3.7×10^{10} = curie in disintegrating atoms per second per curie.

The values for the different uranium nuclide parameters are summarized below:

Uranium Isotope	Radioactive Half-Life[a]	Decay Constant, (λ, sec^{-1})	Gram Atomic Weight (gram/mole)[b]	Composition of Natural Uranium in Atom
Uranium-234	2.445×10^5 y	8.983×10^{-14}	234.040951	0.0055%
Uranium-235	7.038×10^8 y	3.121×10^{-17}	235.043928	0.7200%
Uranium-236	2.3415×10^7 y	9.3805×10^{-16}	236.04556	0%
Uranium-238	4.468×10^9 y	4.916×10^{-18}	238.050788	99.2745%
Natural Uranium	—	—	238.0289	100%

[a]Kocher, D. C., 1981, "Radioactive Decay Data Tables," U.S. Dept. of Energy, Technical Information Center, DOE/TIC-11026.
[b]Walker, F. W., et al., 1984, "Chart of the Nuclides," 13th Edition, General Electric Company (Nuclear Energy Operations), San Jose, CA.

000327

These constants give the following conversions:

	pCi/milligram	
Uranium Isotope	100% Isotope	Natural Uranium
Uranium-234	6.247×10^6	3.379×10^2
Uranium-235	2.161×10^3	1.536×10^1
Uranium-236	6.468×10^4	0
Uranium-238	3.361×10^2	3.337×10^2
Natural Uranium	---	6.869×10^2

From this conversion factor, a 50 mg/kg value for mass of total uranium converts to a screening level of approximately 16 pCi/g for uranium-238.

This screening level was compared to activity levels of uranium-238 in surface soil samples (0-6 inches) extracted for the FEMP facility to determine which samples exceeded 16 pCi/g. Samples that exceeded the screening level for uranium-238 were determined to be radiological sources. A 31-meter square, using the sample location as the center of the square, was used to approximate the extent of surface soil contamination around individual samples. Samples were grouped according to methods described in Section F.1.3.

F.1.3.1.2 Inorganics

Unlike the radionuclides, no single inorganic contaminant was able to define the area of surface soil contamination. Therefore, by combining surface soil samples (0-6 inches) for arsenic and beryllium, a composite source area was defined to represent the extent of contamination for all inorganics of concern. Screening levels for arsenic and beryllium were determined by methods described in the RAGS (EPA 1989) and modified with commercial and industrial equations to account for an inhalation pathway. The modifications increased the conservativeness of the screening levels that were produced by the calculations.

The screening level for arsenic was 0.097 mg/kg and 0.040 mg/kg for beryllium; however, a majority of the in-soil concentration positive hits analyzed for arsenic and beryllium exceeded the screening level and were determined to be sources of emissions. As given above for the radiological analytes, a 31-meter square, using the sample location as the center of the square, was used to approximate the

extent of surface soil contamination around that sample. Samples were grouped according to methods described in Section F.1.3.

F.1.3.1.3 Organics

The organics were divided into three groups, volatile organic analytes, semivolatile organic analytes and polychlorinated biphenyls. From a list of site-specific COCs, four organic chemicals were selected to have the highest frequency of occurrence in soil throughout the site. These organics were benzo(a)anthracene, Aroclor-1254, methylene chloride and tetrachloroethene. Sources were determined by comparing soil concentrations to screening levels for each of the four organics analyzed. These screening levels are benzo(a)anthracene, 0.155 mg/kg; Aroclor-1254, 0.022 mg/kg; methylene chloride, 22.7 mg/kg; and tetrachloroethene, 237 mg/kg. It was determined that soil samples that exceeded screening levels for Aroclor 1254, methylene chloride and tetrachloroethene were the same samples that exceed benzo(a)anthracene screening levels. Therefore, benzo(a)anthracene sources were used to be representative of sources for all the organic chemicals of concern. Screening levels for the organics were determined by methods described in the RAGS, Vol. 1, Part B and modified with commercial and industrial equations to account for an inhalation pathway. The modifications increased the conservativeness of the screening levels.

A 31-meter square, using the sample location as the center of the square, was used to approximate the extent of surface soil contamination around that sample. Samples were grouped according to methods described in Section F.1.3.

F.1.3.1.4 Radon

Radon is a radioactive gas that emits from the natural decay of radium (Ra-226). Therefore, radon sources were determined by evaluating soil activity levels of radium at a depth interval between the surface and 6 inches. A screening level of 5 pCi/g was suggested for radium in soil concentrations. This screening level was derived from the "Standards for Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954", Subpart D, Section (2)i (EPA 1993).

A 31-meter square, using the sample location as the center of the square, was used to approximate the extent of surface soil contamination around that sample. Samples were grouped according to methods described in Section F.1.3.

000329

F.1.3.2 Source Concentrations

Two methods were used to determine source area concentration or activity levels. First, if the number of samples within a source group for any classification (i.e., radiological, inorganics, organics and radon) was greater than seven samples, then a statistical analysis was performed on the sample set for each analyte to determine the 95 percent upper confidence level (UCL) for each source group. Second, if the number of samples within a source group were less than seven, then the maximum concentration for each analyte was selected.

F.1.4 MODELING RESULTS

This section summarizes the results from ISCLT2 modeling of Operable Unit 5, using the input parameters and methods previously mentioned. The post-processing of wind erodible particulate model results with source concentration data resulted in annual average contaminant-specific air concentrations at on-property, off-property and discrete receptors. Radon was the only contaminant modeled directly by the ISCLT2 model. Maximum annual ambient air concentrations were calculated at a flagpole receptor height of 1.5 meters which represents the breathing level for human exposure through inhalation.

F.1.4.1 Wind Erodible Particulate Modeling Results

ISCLT2 air dispersion modeling for Operable Unit 5 produced dispersion factors at all receptors, based on emission rates from sources with either a limited or unlimited erosion potential. These dispersion factors were post-processed with source concentrations for each contaminant. The result was contaminant-specific ambient air concentrations at each receptor. Tables F.1-8 through F.1-10 reflect modeling results based on model input parameters relevant to the current scenario. Table F.1-8 shows locations and chemical-specific maximum annual concentrations at on-property receptors. Table F.1-9 shows chemical-specific maximum annual concentrations and corresponding locations for off-property receptors. Table F.1-10 illustrates maximum annual concentrations at each of 11 discrete receptors for each contaminant of concern.

Tables F.1-11 through F.1-13 reflect air dispersion model results based on model input parameters relevant to the agricultural scenario. Table F.1-11 shows locations and contaminant-specific maximum annual concentrations at on-property receptors. Table F.1-12 shows contaminant-specific maximum annual concentrations and corresponding locations for off-property receptors. Table F.1-13

illustrates maximum annual concentrations at each of 11 discrete receptors for each contaminant of concern.

In general, maximum annual on-property concentrations occurred at receptors located within the eastern third of the production area. Maximum annual off-property concentrations were calculated to occur at receptor locations along the eastern fenceline of the FEMP.

F.1.4.2 Radon Modeling Results

Radon modeling results at on-property, off-property and discrete receptors are listed in Tables F.1-8 through F.1-13. Radon air dispersion modeling results were based on radon flux rates calculated by methods described in section F.1.2.5.5 and Attachment F.1-II. In general, maximum radon concentrations from air dispersion modeling occur at on-property receptors located in the northeast corner of the production area and at off-property receptors located along the eastern fenceline of the FEMP facility. The maximum radon concentrations from modeling only account for Operable Unit 5 radon sources. Major contributors to radon emissions like the K-65 silos were not considered. In addition, radon emissions from the radioactive decay of elements other than radium-226 were not evaluated. Table F.1-14 shows a comparison of radon concentrations collected at air monitoring stations around the FEMP facility to ISCLT2 air dispersion modeled results at receptors located at the monitoring stations. The comparison shows that the air monitoring station concentrations are 2 to 3 orders of magnitude higher than the ISCLT2 model results. This difference can be attributed to emissions from sources other than Operable Unit 5 and the decay of elements other than radium-226. In addition, radon emissions from Operable Unit 5 sources that were below the screening level of 5 pCi/g were not considered in the modeling results, but did contribute to the concentration at the air monitors.

F.1.5 SUMMARY

As part of the baseline risk assessment for Operable Unit 5, an analysis of the transport of contaminants through the air pathway was conducted to estimate its impact on the environment. The analysis used the EPA's regulatory air dispersion model, ISCLT2, to estimate annual concentrations at receptor locations, defined in the conceptual model scenarios from contaminated source areas. Whenever possible site-specific data were used in the air dispersion modeling process. However, when on-site data were not available, conservative assumptions were made so as not to underestimate the impact on air quality. Modeling results estimated maximum annual on-property concentrations to

occur at receptors within the production area, specifically in the northwestern and eastern portions. Maximum annual off-property concentrations occurred at receptors located just east of the production area, along the eastern boundary of the FEMP.

F.1.6 REFERENCES

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000333

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TABLE F.1-1

COMPOSITE MIXING HEIGHTS* IN METERS USED IN ISCLT MODELING FOR FEMP

Stability Class	Wind Speed Class					
	1	2	3	4	5	6
A	1823	1991	1791	1695	1629	2313
B	1215	1327	1194	1130	1086	1542
C	1215	1327	1194	1130	1086	1542
D	1215	1327	1194	1130	1086	1542
E	5000	5000	5000	5000	5000	5000
F	5000	5000	5000	5000	5000	5000

*Obtained from National Weather Service, Dayton, Ohio, from 1987 through 1989, 1991, and 1992.

TABLE F.1-2

COMPOSITE AMBIENT AIR TEMPERATURE* IN DEGREES KELVIN USED IN ISCLT MODELING FOR FEMP

Stability Class					
A	B	C	D	E	F
290	289	288	283	283	283

*Obtained from on-property meteorological data collected from 1987-1989, 1991, and 1992.

TABLE F.1-3

DISPERSION OPTIONS USED IN ISCLT MODELING OF OPERABLE UNIT 5 FOR FEMP

Source Type	Area
Dispersion Mode	Rural
Calculation Mode	Concentration
Building Downwash	None
Flagpole Receptors	1.5 Meters
Discrete Receptors	Yes
Gravitational Setting	Yes
Variable Emissions	Yes
Receptor Grid Type	Cartesian
Discrete Receptor Grid Type	Cartesian
Meteorology Input	Annual STAR Summary*
Terrain Type	Flat
Averaging Period	Annual

*Composite of annual on-property meteorological data for years 1987-1989, 1991 and 1992.

TABLE F.1-4

RADIOLOGICAL SOURCE COORDINATES* USED IN ISCLT2 AIR TRANSPORT MODELING FOR OPERABLE UNIT 5

Source	X-Coordinate (meters)	Y-Coordinate (meters)	Length (meters)
SG1-1	1050	-950	91
SG2-1	950	-900	46
SG2-2	1050	-850	61
SG2-3	1150	-850	61
SG2-4	1050	-775	91
SG2-5	1225	-750	31
SG2-6	1000	-675	76
SG2-7	850	-625	76
SG2-8	650	-675	31
SG3-1	1100	-700	107
SG4-1	800	-300	91
SG4-2	800	-400	46
SG5-1	750	-450	46
SG5-2	750	-725	61
SG5-3	900	-550	76
SG6-1	1500	-650	31
SG7-1	1475	-900	61
SG7-2	1500	-700	46
SG7-3	1375	-950	91
SG7-4	1325	-600	107
SG8-1	1900	-850	91

TABLE F.1-4 (Continued)

Source	X-Coordinate (meters)	Y-Coordinate (meters)	Length (meters)
SG8-2	1675	-475	31
SG9-1	1600	-600	91
SG9-2	950	-1775	31
SG9-3	1875	-600	76
SG9-4	1400	-400	61
SG10-1	1025	-350	46
SG11-1	925	-275	31
SG11-2	1125	-300	61
SG12-1	1400	-275	31
SG13-1	1500	-350	91
SG13-2	1400	-200	107
SG13-3	1300	-375	61
SG14-1	1200	-150	76
SG14-2	1000	-225	91

* Based on origin at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East)

TABLE F.1-5

INORGANIC SOURCE COORDINATES*
USED IN ISCLT2 AIR TRANSPORT MODELING FOR OPERABLE UNIT 5

Source	X-Coordinate (meters)	Y-Coordinate (meters)	Length (meters)
SG1-1	1250	-250	61
SG1-2	1250	-350	91
SG1-3	1700	-25	91
SG1-4	1500	-150	61
SG1-5	1500	-300	76
SG1-6	1850	+400	31
SG2-1	925	-950	76
SG2-2	1050	-950	76
SG2-3	1050	-825	76
SG2-4	875	-800	91
SG2-5	800	-650	76
SG2-6	900	-650	122
SG2-7	1025	-700	107
SG2-8	1150	-750	76
SG3-1	900	-500	61
SG3-2	925	-425	107
SG3-3	950	-300	76
SG3-4	800	-350	61
SG3-5	800	-250	76
SG3-6	875	-150	46
SG3-7	700	-500	76
SG4-1	350	-575	107
SG4-2	525	-550	76
SG4-3	250	-450	46
SG4-4	425	-725	61
SG4-5	575	-700	107

TABLE F.1-5 (Continued)

Source	X-Coordinate (meters)	Y-Coordinate (meters)	Length (meters)
SG4-6	550	-800	107
SG4-7	450	-850	76
SG4-8	350	-1000	31
SG5-1	750	+50	46
SG5-2	850	+100	76
SG5-3	1050	+100	76
SG5-4	1275	+50	46
SG5-5	1200	-100	76
SG5-6	1300	+275	31
SG6-1	1350	-800	91
SG6-2	1550	-750	91
SG6-3	1350	-925	31
SG6-4	1450	-950	107
SG6-5	1675	-1150	91
SG6-6	1800	-1450	122
SG7-1	175	-100	46
SG7-2	350	-150	61
SG7-3	375	-275	61
SG8-1	700	-1200	76
SG8-2	1075	-1750	76
SG9-1	1875	-875	107
SG9-2	1700	-550	91
SG9-3	1300	-550	107

* Based on origin at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East)

TABLE F.1-6

ORGANIC SOURCE COORDINATES* USED IN ISCLT2 AIR TRANSPORT MODELING FOR OPERABLE UNIT 5

Source	X-Coordinate (meters)	Y-Coordinate (meters)	Length (meters)
SG1-1	1150	-1650	61
SG1-2	1725	-1550	76
SG2-1	550	-1350	76
SG2-2	800	-1000	76
SG3-1	1050	-950	76
SG3-2	1075	-725	91
SG4-1	925	-925	61
SG5-1	1400	-925	30
SG5-2	1400	-725	30
SG5-3	1350	-625	30
SG6-1	1550	-700	91
SG6-2	1875	-850	122
SG6-3	1875	-500	61
SG7-1	1550	-150	122
SG8-1	1200	-75	76
SG8-2	1225	-175	76
SG8-3	1300	-325	107
SG8-4	1275	-500	61
SG9-1	1425	-325	30
SG10-1	1325	-550	30
SG11-1	925	-600	61
SG11-2	925	-400	61
SG11-3	990	-400	61
SG11-4	650	-500	76
SG12-1	200	-200	76
SG12-2	800	+100	122

* Based on origin at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East)

TABLE F.1-7

RADON SOURCE COORDINATES*
USED IN ISCLT2 AIR TRANSPORT MODELING FOR OPERABLE UNIT 5

Source	X-Coordinate (meters)	Y-Coordinate (meters)	Length (meters)
1	450	-725	46
2	950	-900	46
3	1100	-725	31
4	1075	-625	31
5	1025	-350	31
6	1450	-200	31
7	1850	-950	46
8	1850	-900	46
9	1900	-825	31

* Based on origin at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East)

TABLE F.1-8

MAXIMUM ANNUAL AVERAGE CONCENTRATIONS AT ON PROPERTY RECEPTORS (CURRENT SCENARIO)

Contaminant	Location* (X,Y)		Concentration
Radiological (pCi/m^3)			
Cesium-137	1150	-850	5.10E-07
Neptunium-237	1200	-550	3.20E-07
Plutonium-238	1150	-850	1.80E-05
Plutonium-239/24	1150	-850	1.80E-06
Radium-226	1600	-250	4.80E-04
Radium-228	1700	-500	7.20E-05
Ruthenium-106	1000	-500	1.10E-06
Strontium-90	1200	-550	9.80E-07
Technetium-99	2000	-750	2.60E-05
Thorium-Total (ug/m3)	1550	-850	1.30E-04
Thorium-228	1150	-850	2.20E-05
Thorium-230	1700	-500	9.90E-04
Thorium-232	1150	-850	2.50E-05
Uranium, Total (ug/m3)	1150	-850	5.00E-03
Uranium-234	1150	-850	1.50E-03
Uranium-235/236	1150	-850	1.20E-04
Uranium-238	1150	-850	1.70E-03
Radon	1500	-200	3.52E+02
Inorganics (ug/m3)			
Aluminum	1000	-450	4.40E-03
Antimony	1000	-450	1.20E-05
Arsenic	700	-700	6.90E-06
Barium	1150	-750	1.20E-04
Beryllium	1150	-750	5.70E-07
Cadmium	700	-600	2.00E-06

TABLE F.1-8 (Continued)

Contaminant	Location* (X,Y)		Concentration
Calcium	1000	-450	5.40E-02
Chromium	1000	-500	9.00E-06
Cobalt	1150	-750	4.70E-06
Copper	1350	-250	1.90E-05
Cyanide	1550	-800	2.20E-07
Iron	1000	-500	8.50E-03
Lead	1550	-800	3.80E-04
Magnesium	1400	-450	1.20E-02
Manganese	1150	-750	4.40E-04
Mercury	1150	-750	4.50E-07
Molybdenum	1150	-750	4.80E-06
Nickel	1150	-750	1.00E-05
Potassium	1000	-500	5.70E-04
Selenium	1150	-750	8.20E-07
Silicon	1050	-300	1.60E-03
Silver	1150	-750	4.30E-06
Sodium	1150	-750	4.60E-04
Thallium	700	-600	1.50E-07
Vanadium	1150	-750	1.10E-05
Zinc	1300	0	1.10E-04
Volatiles/Semi-Volatiles/PCBs (ug/m3)			
4,4'-DDE	1200	-650	4.10E-10
4,4'-DDT	1300	-100	3.10E-10
Alpha-chlordane	1050	-400	5.80E-11
Aroclor-1254	1200	-650	1.60E-07
Aroclor-1260	1300	-100	3.80E-09
Benzene	1300	-100	3.10E-11
Benzo(a)anthracene	1450	-350	2.10E-07
Benzo(a)pyrene	1450	-350	2.40E-07

TABLE F.1-8 (Continued)

Contaminant	Location* (X,Y)		Concentration
Benzo(b)fluoranthane	1350	-500	2.20E-07
Benzo(k)fluoranthane	1450	-350	2.30E-07
Bis(2-ethylhexyl)phthalate	1300	-100	1.50E-08
Carbazole	1450	-350	3.00E-08
Chloroform	1300	-100	1.40E-10
Chrysene	1350	-500	1.20E-07
Dibenzo(a,h)anthracene	1450	-350	7.90E-08
Dieldrin	1200	-650	1.00E-10
Indeno(1,2,3-cd)pyrene	1350	-500	8.70E-08
Methylene chloride	1450	-350	1.40E-07
N-nitroso-di-n-propylamine	1300	-100	6.10E-10
N-nitrosodiphenylamine	1050	-350	1.50E-08
Octachlorodibenzo-p-dioxin	1050	-350	1.00E-11
Octachlorodibenzofuran	1300	-100	7.80E-12
Tetrachloroethene	950	200	1.90E-02
Trichloroethene	950	200	3.90E-02

* Distance in meters from origin located at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East).

TABLE F.1-9

MAXIMUM ANNUAL AVERAGE CONCENTRATIONS AT OFF PROPERTY RECEPTORS (CURRENT SCENARIO)

Contaminant	Location* (X,Y)		Concentration
Radiological (pCi/m^3)			
Cesium-137	2050	-750	9.50E-08
Neptunium-237	2050	-650	1.50E-08
Plutonium-238	2050	-900	5.10E-07
Plutonium-239/24	2050	-800	1.70E-07
Radium-226	2050	-300	4.60E-05
Radium-228	2050	-550	3.30E-05
Ruthenium-106	1250	400	3.50E-08
Strontium-90	2050	-750	6.40E-07
Technetium-99	2050	-800	1.90E-05
Thorium-Total (ug/m3)	2050	-850	1.20E-05
Thorium-228	2050	-750	3.40E-06
Thorium-230	2050	-550	4.50E-04
Thorium-232	2050	-550	8.80E-06
Uranium, Total (ug/m3)	2050	-800	5.60E-04
Uranium-234	2050	-800	2.80E-04
Uranium-235/236	2050	-800	1.50E-05
Uranium-238	2050	-800	2.00E-04
Radon	2050	-200	8.21E+00
Inorganics (ug/m3)			
Aluminum	2050	-800	1.80E-03
Antimony	2050	-800	3.50E-06
Arsenic	2050	-800	2.20E-06
Barium	2050	-800	2.40E-05
Beryllium	2050	-800	2.50E-07
Cadmium	2050	-800	1.00E-06

TABLE F.1-9 (Continued)

Contaminant	Location* (X,Y)		Concentration
Calcium	2050	-800	2.80E-02
Chromium	2050	-800	4.70E-06
Cobalt	2050	-800	2.00E-06
Copper	2050	-800	6.40E-06
Cyanide	2050	-800	1.40E-07
Iron	2050	-800	3.80E-03
Lead	2050	-1350	1.50E-04
Magnesium	2050	-800	8.80E-03
Manganese	2050	-800	2.50E-04
Mercury	2050	-800	9.60E-08
Molybdenum	2050	-800	1.50E-06
Nickel	2050	-800	5.30E-06
Potassium	2050	-800	2.30E-04
Selenium	1450	400	8.40E-08
Silicon	2050	-800	4.40E-04
Silver	2050	-800	1.10E-06
Sodium	2050	-800	6.10E-05
Thallium	2050	-800	6.20E-08
Vanadium	2050	-800	4.90E-06
Zinc	2050	-800	3.10E-05
Volatiles/Semi-Volatiles/PCBs (ug/m3)			
4,4'-DDE	1600	400	1.30E-11
4,4'-DDT	1450	400	3.80E-11
Alpha-chlordane	1250	400	3.80E-12
Aroclor-1254	1600	400	1.20E-08
Aroclor-1260	1450	400	4.00E-10
Benzene	1450	400	3.40E-12
Benzo(a)anthracene	1600	400	8.10E-09
Benzo(a)pyrene	1600	400	1.00E-08

TABLE F.1-9 (Continued)

Contaminant	Location* (X,Y)		Concentration
Benzo(b)fluoranthane	2050	-750	1.00E-08
Benzo(k)fluoranthane	1600	400	1.00E-08
Bis(2-ethylhexyl)phthalate	1600	400	2.10E-09
Carbazole	2050	-750	2.10E-09
Chloroform	1450	400	1.60E-11
Chrysene	2050	-750	8.10E-09
Dibenzo(a,h)anthracene	1600	400	3.40E-09
Dieldrin	1550	400	4.10E-12
Indeno(1,2,3-cd)pyrene	2050	-750	6.70E-09
Methylene chloride	1750	450	2.40E-09
N-nitroso-di-n-propylamine	1450	400	6.60E-11
N-nitrosodiphenylamine	1250	400	9.20E-10
Octachlorodibenzo-p-dioxin	1450	400	9.10E-13
Octachlorodibenzofuran	1450	400	8.40E-13
Tetrachloroethene	950	400	7.20E-03
Trichloroethene	950	400	1.40E-02

* Distance in meters from origin located at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East).

TABLE F.1-10

MAXIMUM ANNUAL AVERAGE CONCENTRATIONS AT DISCRETE RECEPTORS (CURRENT SCENARIO)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knolmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Radiological (pCi/m3)											
Cesium-137	4.80E-09	2.50E-09	6.00E-09	4.50E-09	5.20E-09	5.70E-09	1.30E-08	1.40E-08	3.10E-09	8.70E-09	4.20E-09
Neptunium-237	1.30E-09	3.40E-10	1.40E-09	8.80E-10	1.20E-09	1.30E-09	4.50E-09	4.20E-09	1.10E-09	3.20E-09	1.50E-09
Plutonium-238	3.80E-08	7.10E-09	3.70E-08	2.20E-08	3.00E-08	3.40E-08	1.70E-07	1.20E-07	3.40E-08	1.10E-07	4.70E-08
Plutonium-239/24	5.50E-09	1.00E-09	5.60E-09	3.30E-09	4.60E-09	5.30E-09	2.30E-08	1.90E-08	4.90E-09	1.50E-08	6.70E-09
Radium-226	1.10E-06	4.40E-08	1.60E-06	6.00E-07	1.20E-06	1.50E-06	4.80E-06	7.20E-06	1.30E-06	3.10E-06	1.80E-06
Radium-228	3.20E-07	1.10E-08	3.80E-07	1.60E-07	2.80E-07	3.50E-07	1.80E-06	1.90E-06	3.50E-07	1.10E-06	5.00E-07
Ruthenium-106	2.50E-09	8.50E-11	2.10E-09	1.00E-09	1.70E-09	2.00E-09	8.60E-09	7.90E-09	2.30E-09	6.20E-09	3.00E-09
Strontium-90	7.60E-09	2.60E-10	8.90E-09	3.80E-09	6.70E-09	8.30E-09	3.90E-08	4.40E-08	8.40E-09	2.30E-08	1.20E-08
Technetium-99	8.20E-08	2.60E-08	1.10E-07	6.40E-08	9.10E-08	1.10E-07	4.10E-07	5.30E-07	7.10E-08	1.80E-07	1.00E-07
Thorium-Total (μg/m3)	4.00E-07	1.40E-08	4.50E-07	2.00E-07	3.40E-07	4.20E-07	2.10E-06	2.10E-06	4.50E-07	1.30E-06	6.60E-07
Thorium-228	1.10E-07	5.40E-08	1.40E-07	1.00E-07	1.20E-07	1.30E-07	3.60E-07	3.40E-07	7.50E-08	2.30E-07	1.00E-07
Thorium-230	2.80E-06	1.10E-07	3.90E-06	1.50E-06	2.80E-06	3.60E-06	1.70E-05	2.10E-05	3.30E-06	9.30E-06	4.60E-06
Thorium-232	1.90E-07	6.10E-08	2.30E-07	1.40E-07	1.90E-07	2.10E-07	7.60E-07	7.70E-07	1.50E-07	4.50E-07	2.20E-07
Uranium, Total (μg/m3)	1.30E-05	3.00E-06	1.40E-05	8.50E-06	1.10E-05	1.30E-05	5.90E-05	4.80E-05	1.20E-05	3.70E-05	1.70E-05
Uranium-234	3.90E-06	2.90E-07	4.10E-06	2.00E-06	3.10E-06	3.80E-06	2.10E-05	1.80E-05	4.10E-06	1.20E-05	5.70E-06
Uranium-235/236	3.40E-07	4.60E-08	3.50E-07	1.90E-07	2.80E-07	3.30E-07	1.60E-06	1.30E-06	3.30E-07	1.00E-06	4.50E-07

TABLE F.1-10 (Continued)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knolmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Uranium-238	4.70E-06	1.00E-06	5.00E-06	3.00E-06	4.10E-06	4.70E-06	2.10E-05	1.80E-05	4.20E-06	1.30E-05	5.90E-06
Radon	1.66E-01	7.89E-01	4.30E-01	1.65E-01	2.80E-01	3.78E-01	1.03E+00	1.44E+00	1.43E-01	3.42E-01	2.01E-01
Inorganics (μg/m3)											
Aluminum	6.00E-05	2.20E-06	5.80E-05	2.60E-05	4.50E-05	5.40E-05	3.30E-04	2.50E-04	5.90E-05	1.70E-04	8.20E-05
Antimony	1.30E-07	4.70E-09	1.10E-07	5.30E-08	8.70E-08	1.00E-07	5.50E-07	4.70E-07	1.20E-07	3.10E-07	1.60E-07
Arsenic	7.30E-08	2.70E-09	6.40E-08	3.00E-08	5.00E-08	6.00E-08	3.50E-07	2.80E-07	6.70E-08	1.80E-07	9.20E-08
Barium	8.70E-07	3.00E-08	8.40E-07	3.90E-07	6.50E-07	7.90E-07	4.50E-06	3.60E-06	8.70E-07	2.50E-06	1.20E-06
Beryllium	6.90E-09	2.40E-10	6.70E-09	3.10E-09	5.20E-09	6.30E-09	3.70E-08	3.00E-08	6.80E-09	2.00E-08	9.50E-09
Cadmium	2.90E-08	1.10E-09	2.70E-08	1.20E-08	2.10E-08	2.60E-08	1.40E-07	1.20E-07	2.70E-08	7.20E-08	3.70E-08
Calcium	7.60E-04	2.70E-05	7.50E-04	3.40E-04	5.80E-04	7.00E-04	4.20E-03	3.30E-03	7.60E-04	2.20E-03	1.10E-03
Chromium	1.20E-07	4.40E-09	1.20E-07	5.50E-08	9.30E-08	1.10E-07	6.40E-07	5.40E-07	1.20E-07	3.30E-07	1.70E-07
Cobalt	6.40E-08	2.30E-09	6.10E-08	2.80E-08	4.70E-08	5.70E-08	3.30E-07	2.60E-07	6.20E-08	1.70E-07	8.60E-08
Copper	2.10E-07	7.30E-09	2.30E-07	1.00E-07	1.70E-07	2.10E-07	1.40E-06	1.00E-06	2.20E-07	6.00E-07	3.10E-07
Cyanide	3.20E-09	1.10E-10	3.40E-09	1.50E-09	2.60E-09	3.20E-09	2.20E-08	1.60E-08	3.40E-09	9.60E-09	4.80E-09
Iron	1.20E-04	4.30E-06	1.20E-04	5.30E-05	9.00E-05	1.10E-04	6.50E-04	5.10E-04	1.20E-04	3.30E-04	1.60E-04
Lead	2.70E-06	7.70E-08	3.00E-06	1.30E-06	2.20E-06	2.70E-06	3.00E-05	1.50E-05	3.00E-06	8.60E-06	4.50E-06
Magnesium	1.80E-04	6.10E-06	1.80E-04	8.00E-05	1.40E-04	1.70E-04	1.00E-03	8.20E-04	1.80E-04	4.90E-04	2.50E-04
Manganese	6.40E-06	2.30E-07	6.10E-06	2.80E-06	4.70E-06	5.70E-06	3.30E-05	2.70E-05	6.20E-06	1.70E-05	8.50E-06
Mercury	2.40E-09	8.20E-11	2.50E-09	1.10E-09	1.90E-09	2.30E-09	1.30E-08	1.10E-08	2.50E-09	7.20E-09	3.50E-09
Molybdenum	4.70E-08	1.70E-09	4.90E-08	2.20E-08	3.80E-08	4.60E-08	2.70E-07	2.20E-07	4.80E-08	1.30E-07	6.70E-08
Nickel	1.50E-07	5.30E-09	1.40E-07	6.40E-08	1.10E-07	1.30E-07	7.20E-07	6.20E-07	1.40E-07	3.90E-07	2.00E-07

TABLE F.1-10 (Continued)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knolmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Potassium	7.60E-06	2.70E-07	7.30E-06	3.40E-06	5.70E-06	6.90E-06	4.00E-05	3.20E-05	7.50E-06	2.10E-05	1.00E-05
Selenium	5.90E-09	2.10E-10	5.30E-09	2.60E-09	4.20E-09	5.00E-09	2.70E-08	2.10E-08	5.80E-09	1.70E-08	7.90E-09
Silicon	1.10E-05	4.10E-07	1.10E-05	4.90E-06	8.40E-06	1.00E-05	4.70E-05	4.60E-05	1.10E-05	2.90E-05	1.50E-05
Silver	5.10E-08	1.90E-09	4.80E-08	2.20E-08	3.70E-08	4.50E-08	2.60E-07	2.00E-07	4.90E-08	1.30E-07	6.80E-08
Sodium	2.50E-06	8.80E-08	2.50E-06	1.10E-06	1.90E-06	2.30E-06	1.20E-05	1.00E-05	2.60E-06	7.50E-06	3.50E-06
Thallium	2.10E-09	7.80E-11	2.00E-09	9.20E-10	1.60E-09	1.90E-09	9.80E-09	8.70E-09	2.00E-09	5.30E-09	2.70E-09
Vanadium	1.50E-07	5.40E-09	1.50E-07	6.70E-08	1.10E-07	1.40E-07	8.10E-07	6.40E-07	1.50E-07	4.20E-07	2.10E-07
Zinc	9.20E-07	3.40E-08	1.00E-06	4.30E-07	8.00E-07	9.60E-07	4.30E-06	4.50E-06	9.40E-07	2.40E-06	1.30E-06
Volatiles/Semivolatiles/PCBs (μg/m3)											
4,4'-DDE	4.90E-13	<1.00E-14	8.40E-13	4.20E-13	5.30E-13	7.20E-13	4.60E-12	2.90E-12	8.00E-13	2.50E-12	1.20E-12
4,4'-DDT	6.50E-13	<1.00E-14	1.30E-12	5.40E-13	8.50E-13	1.20E-12	4.80E-12	4.90E-12	9.70E-13	2.70E-12	1.40E-12
Alpha-chlordane	1.30E-13	<1.00E-14	1.90E-13	9.20E-14	1.30E-13	1.70E-13	7.90E-13	6.30E-13	1.70E-13	4.90E-13	2.50E-13
Aroclor-1254	2.70E-10	<1.00E-14	5.70E-10	2.50E-10	3.70E-10	5.00E-10	2.40E-09	2.20E-09	4.50E-10	1.30E-09	6.50E-10
Aroclor-1260	5.00E-12	<1.00E-14	1.20E-11	4.30E-12	7.40E-12	1.00E-11	3.40E-11	4.50E-11	7.40E-12	1.90E-11	1.10E-11
Benzene	4.20E-14	<1.00E-14	9.60E-14	3.60E-14	6.20E-14	8.40E-14	2.90E-13	3.70E-13	6.20E-14	1.60E-13	8.80E-14
Benzo(a)anthracene	1.80E-10	<1.00E-14	3.70E-10	1.70E-10	2.20E-10	2.70E-10	1.30E-09	1.40E-09	2.40E-10	6.80E-10	3.30E-10
Benzo(a)pyrene	2.10E-10	<1.00E-14	4.40E-10	2.00E-10	2.60E-10	3.10E-10	1.50E-09	1.60E-09	2.80E-10	7.80E-10	3.80E-10
Benzo(b)fluoranthene	2.00E-10	<1.00E-14	4.10E-10	1.70E-10	2.60E-10	3.30E-10	1.50E-09	1.60E-09	2.80E-10	7.60E-10	4.30E-10
Benzo(k)fluoranthene	2.00E-10	<1.00E-14	4.10E-10	1.80E-10	2.50E-10	3.10E-10	1.40E-09	1.60E-09	2.60E-10	7.20E-10	3.50E-10
Bis(2-ethylhexyl)phthalate	4.50E-11	<1.00E-14	8.70E-11	3.70E-11	5.70E-11	7.60E-11	3.60E-10	3.40E-10	6.70E-11	1.90E-10	9.70E-11
Carbazole	1.90E-11	<1.00E-14	3.80E-11	1.70E-11	2.10E-11	2.50E-11	1.50E-10	1.60E-10	2.40E-11	6.70E-11	3.00E-11

TABLE F.1-10 (Continued)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knolmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Chloroform	2.20E-13	<1.00E-14	5.00E-13	1.90E-13	3.20E-13	4.30E-13	1.60E-12	1.90E-12	3.30E-13	8.70E-13	4.80E-13
Chrysene	1.60E-10	<1.00E-14	3.30E-10	1.40E-10	2.10E-10	2.80E-10	1.20E-09	1.30E-09	2.40E-10	6.50E-10	3.50E-10
Dibenzo(a,h)anthracene	6.70E-11	<1.00E-14	1.40E-10	6.30E-11	8.40E-11	1.00E-10	4.80E-10	5.30E-10	8.80E-11	2.40E-10	1.20E-10
Dieldrin	1.60E-13	<1.00E-14	2.60E-13	1.30E-13	1.70E-13	2.20E-13	1.30E-12	8.70E-13	2.40E-13	7.30E-13	3.50E-13
Indeno(1,2,3-cd)pyrene	1.20E-10	<1.00E-14	2.50E-10	1.10E-10	1.60E-10	2.10E-10	9.40E-10	9.90E-10	1.80E-10	4.90E-10	2.70E-10
Methylene chloride	5.00E-11	<1.00E-14	1.00E-10	5.00E-11	5.10E-11	5.10E-11	3.00E-10	3.50E-10	5.10E-11	1.50E-10	5.20E-11
N-nitroso-di-n-propylamine	8.20E-13	<1.00E-14	1.90E-12	7.00E-13	1.20E-12	1.60E-12	5.60E-12	7.30E-12	1.20E-12	3.00E-12	1.70E-12
N-nitrosodiphenylamine	2.70E-11	<1.00E-14	4.10E-11	1.80E-11	2.80E-11	3.60E-11	1.40E-10	1.30E-10	3.30E-11	8.90E-11	4.80E-11
Octachlorodibenzo-p-dioxin	2.20E-14	<1.00E-14	3.60E-14	1.60E-14	2.50E-14	3.20E-14	1.20E-13	1.20E-13	2.80E-14	7.50E-14	4.10E-14
Octachlorodibenzofuran	1.00E-14	<1.00E-14	2.40E-14	9.00E-15	1.50E-14	2.10E-14	7.10E-14	9.30E-14	1.50E-14	3.90E-14	2.20E-14
Tetrachloroethene	5.00E-05	<1.00E-14	6.20E-05	2.40E-05	4.40E-05	5.80E-05	1.40E-04	1.90E-04	4.40E-05	1.00E-04	6.00E-05
Trichloroethene	1.00E-04	<1.00E-14	1.20E-04	4.80E-05	8.80E-05	1.20E-04	2.80E-04	3.80E-04	8.80E-05	2.00E-04	1.20E-04

TABLE F.1-11

MAXIMUM ANNUAL AVERAGE CONCENTRATIONS AT ON PROPERTY RECEPTORS (AGRICULTURAL SCENARIO)

Contaminant	Location* (X,Y)		Concentration
Radiological (pCi/m3)			
Cesium-137	1150	-850	1.40E-05
Neptunium-237	1200	-550	8.70E-06
Plutonium-238	1150	-850	4.80E-04
Plutonium-239/24	1150	-850	4.80E-05
Radium-226	1600	-250	1.30E-02
Radium-228	1700	-500	1.90E-03
Ruthenium-106	1000	-500	3.10E-05
Strontium-90	1200	-550	2.70E-05
Technetium-99	2000	-750	7.00E-04
Thorium-Total (ug/m3)	1550	-850	3.60E-03
Thorium-228	1150	-850	5.90E-04
Thorium-230	1700	-500	2.70E-02
Thorium-232	1150	-850	6.80E-04
Uranium, Total (ug/m3)	1150	-850	1.30E-01
Uranium-234	1150	-850	4.20E-02
Uranium-235/236	1150	-850	3.10E-03
Uranium-238	1150	-850	4.50E-02
Radon	1500	-200	3.52E+02
Inorganics (ug/m3)			
Aluminum	1000	-450	1.20E-01
Antimony	1000	-450	3.30E-04
Arsenic	700	-700	1.90E-04
Barium	1150	-750	3.20E-03
Beryllium	1150	-750	1.50E-05
Cadmium	700	-600	5.50E-05

TABLE F.1-11 (Continued)

Contaminant	Location* (X,Y)		Concentration
Calcium	1000	-450	1.50E+00
Chromium	1000	-500	2.40E-04
Cobalt	1150	-750	1.30E-04
Copper	1350	-250	5.10E-04
Cyanide	1550	-800	6.00E-06
Iron	1000	-500	2.30E-01
Lead	1550	-800	1.00E-02
Magnesium	1400	-450	3.10E-01
Manganese	1150	-750	1.20E-02
Mercury	1150	-750	1.20E-05
Molybdenum	1150	-750	1.30E-04
Nickel	1150	-750	2.80E-04
Potassium	1000	-500	1.50E-02
Selenium	1150	-750	2.20E-05
Silicon	1050	-300	4.40E-02
Silver	1150	-750	1.20E-04
Sodium	1150	-750	1.20E-02
Thallium	700	-600	4.10E-06
Vanadium	1150	-750	2.90E-04
Zinc	1300	0	3.00E-03
Volatiles/Semi-Volatiles/PCBs (ug/m3)			
4,4'-DDE	1200	-650	1.10E-08
4,4'-DDT	1300	-100	8.40E-09
Alpha-chlordane	1050	-400	1.60E-09
Aroclor-1254	1200	-650	4.20E-06
Aroclor-1260	1300	-100	1.00E-07
Benzene	1300	-100	8.40E-10
Benzo(a)anthracene	1450	-350	5.50E-06
Benzo(a)pyrene	1450	-350	6.40E-06

TABLE F.1-11 (Continued)

Contaminant	Location* (X,Y)		Concentration
Benzo(b)fluoranthane	1350	-500	5.90E-06
Benzo(k)fluoranthane	1450	-350	6.30E-06
Bis(2-ethylhexyl)phthalate	1300	-100	4.00E-07
Carbazole	1450	-350	8.00E-07
Chloroform	1300	-100	3.80E-09
Chrysene	1350	-500	3.10E-06
Dibenzo(a,h)anthracene	1450	-350	2.10E-06
Dieldrin	1200	-650	2.70E-09
Indeno(1,2,3-cd)pyrene	1350	-500	2.30E-06
Methylene chloride	1450	-350	3.80E-06
N-nitroso-di-n-propylamine	1300	-100	1.60E-08
N-nitrosodiphenylamine	1050	-350	3.90E-07
Octachlorodibenzo-p-dioxin	1050	-350	2.80E-10
Octachlorodibenzofuran	1300	-100	2.10E-10
Tetrachloroethene	950	200	5.20E-01
Trichloroethene	950	200	1.00E+00

* Distance in meters from origin located at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East).

TABLE F.1-12

MAXIMUM ANNUAL AVERAGE CONCENTRATIONS AT OFF-PROPERTY RECEPTORS (AGRICULTURAL SCENARIO)

Contaminant	Location* (X,Y)		Concentrations
Radiological (pCi/m3)			
Cesium-137	2050	-750	2.60E-06
Neptunium-237	2050	-650	4.10E-07
Plutonium-238	2050	-900	1.40E-05
Plutonium-239/24	2050	-800	4.60E-06
Radium-226	2050	-300	1.20E-03
Radium-228	2050	-550	8.80E-04
Ruthenium-106	1250	400	9.40E-07
Strontium-90	2050	-750	1.70E-05
Technetium-99	2050	-800	5.00E-04
Thorium-Total (ug/m3)	2050	-850	3.20E-04
Thorium-228	2050	-750	9.20E-05
Thorium-230	2050	-550	1.20E-02
Thorium-232	2050	-550	2.40E-04
Uranium, Total (ug/m3)	2050	-800	1.50E-02
Uranium-234	2050	-800	7.50E-03
Uranium-235/236	2050	-800	4.20E-04
Uranium-238	2050	-800	5.40E-03
Radon	2050	-200	8.21E+00
Inorganics (ug/m3)			
Aluminum	2050	-800	4.90E-02
Antimony	2050	-800	9.40E-05
Arsenic	2050	-800	6.00E-05
Barium	2050	-800	6.40E-04
Beryllium	2050	-800	6.80E-06
Cadmium	2050	-800	2.80E-05

TABLE F.1-12 (Continued)

Contaminant	Location* (X,Y)		Concentrations
Calcium	2050	-800	7.50E-01
Chromium	2050	-800	1.30E-04
Cobalt	2050	-800	5.30E-05
Copper	2050	-800	1.70E-04
Cyanide	2050	-800	3.80E-06
Iron	2050	-800	1.00E-01
Lead	2050	-1350	4.10E-03
Magnesium	2050	-800	2.40E-01
Manganese	2050	-800	6.80E-03
Mercury	2050	-800	2.60E-06
Molybdenum	2050	-800	4.10E-05
Nickel	2050	-800	1.40E-04
Potassium	2050	-800	6.20E-03
Selenium	1450	400	2.30E-06
Silicon	2050	-800	1.20E-02
Silver	2050	-800	3.00E-05
Sodium	2050	-800	1.70E-03
Thallium	2050	-800	1.70E-06
Vanadium	2050	-800	1.30E-04
Zinc	2050	-800	8.40E-04
Volatiles/Semi-Volatiles/PCBs (ug/m3)			
4,4'-DDE	1600	400	3.50E-10
4,4'-DDT	1450	400	1.00E-09
Alpha-chlordane	1250	400	1.00E-10
Aroclor-1254	1600	400	3.20E-07
Aroclor-1260	1450	400	1.10E-08
Benzene	1450	400	9.10E-11
Benzo(a)anthracene	1600	400	2.20E-07
Benzo(a)pyrene	1600	400	2.70E-07

TABLE F.1-12 (Continued)

Contaminant	Location* (X,Y)		Concentrations
Benzo(b)fluoranthane	2050	-750	2.70E-07
Benzo(k)fluoranthane	1600	400	2.70E-07
Bis(2-ethylhexyl)phthalate	1600	400	5.60E-08
Carbazole	2050	-750	5.70E-08
Chloroform	1450	400	4.20E-10
Chrysene	2050	-750	2.20E-07
Dibenzo(a,h)anthracene	1600	400	9.20E-08
Dieldrin	1550	400	1.10E-10
Indeno(1,2,3-cd)pyrene	2050	-750	1.80E-07
Methylene chloride	1750	450	6.60E-08
N-nitroso-di-n-propylamine	1450	400	1.80E-09
N-nitrosodiphenylamine	1250	400	2.50E-08
Octachlorodibenzo-p-dioxin	1450	400	2.50E-11
Octachlorodibenzofuran	1450	400	2.30E-11
Tetrachloroethene	950	400	1.90E-01
Trichloroethene	950	400	3.90E-01

* Distance in meters from origin located at State Planer coordinates 482,752.690 feet (North) and 1,376,778.760 feet (East).

TABLE F.1-13

MAXIMUM ANNUAL AVERAGE CONCENTRATIONS AT DISCRETE RECEPTORS (AGRICULTURAL SCENARIO)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knollmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Radiological (pCi/m3)											
Cesium-137	7.70E-08	2.60E-09	8.10E-08	3.60E-08	6.30E-08	7.60E-08	3.50E-07	3.60E-07	8.00E-08	2.30E-07	1.10E-07
Neptunium-237	2.80E-08	9.60E-10	2.70E-08	1.30E-08	2.10E-08	2.60E-08	1.20E-07	1.10E-07	3.00E-08	8.50E-08	4.00E-08
Plutonium-238	8.90E-07	2.70E-08	7.90E-07	3.90E-07	6.00E-07	7.30E-07	4.50E-06	3.10E-06	9.10E-07	3.00E-06	1.30E-06
Plutonium-239/24	1.30E-07	4.20E-09	1.20E-07	5.70E-08	9.40E-08	1.10E-07	6.10E-07	5.10E-07	1.30E-07	4.00E-07	1.80E-07
Radium-226	3.00E-05	1.20E-06	4.20E-05	1.60E-05	3.30E-05	4.00E-05	1.30E-04	1.90E-04	3.40E-05	8.30E-05	4.70E-05
Radium-228	8.60E-06	2.80E-07	1.00E-05	4.20E-06	7.60E-06	9.40E-06	4.80E-05	5.10E-05	9.50E-06	2.90E-05	1.30E-05
Ruthenium-106	6.70E-08	2.40E-09	5.50E-08	2.80E-08	4.50E-08	5.30E-08	2.30E-07	2.10E-07	6.10E-08	1.70E-07	8.20E-08
Strontium-90	2.00E-07	7.00E-09	2.40E-07	1.00E-07	1.80E-07	2.20E-07	1.00E-06	1.20E-06	2.30E-07	6.10E-07	3.10E-07
Technetium-99	1.70E-06	5.40E-08	2.30E-06	8.90E-07	1.70E-06	2.10E-06	1.10E-05	1.40E-05	1.90E-06	4.70E-06	2.70E-06
Thorium-Total ($\mu g/m^3$)	1.10E-05	3.40E-07	1.20E-05	5.30E-06	9.00E-06	1.10E-05	5.80E-05	5.50E-05	1.20E-05	3.40E-05	1.80E-05
Thorium-228	1.90E-06	6.20E-08	2.00E-06	8.70E-07	1.50E-06	1.80E-06	9.50E-06	9.00E-06	2.00E-06	6.00E-06	2.80E-06
Thorium-230	7.60E-05	2.50E-06	1.00E-04	4.00E-05	7.60E-05	9.50E-05	4.50E-04	5.70E-04	8.80E-05	2.50E-04	1.20E-04
Thorium-232	3.70E-06	1.20E-07	4.30E-06	1.80E-06	3.20E-06	3.90E-06	2.00E-05	2.10E-05	4.10E-06	1.20E-05	5.80E-06
Uranium, Total ($\mu g/m3$)	3.10E-04	9.70E-06	2.90E-04	1.40E-04	2.20E-04	2.70E-04	1.60E-03	1.30E-03	3.20E-04	1.00E-03	4.40E-04
Uranium-234	1.00E-04	3.20E-06	1.00E-04	4.80E-05	7.90E-05	9.70E-05	5.60E-04	4.90E-04	1.10E-04	3.40E-04	1.50E-04
Uranium-235/236	8.30E-06	2.70E-07	8.20E-06	3.80E-06	6.20E-06	7.60E-06	4.20E-05	3.60E-05	8.80E-06	2.70E-05	1.20E-05
Uranium-238	1.10E-04	3.40E-06	1.10E-04	4.90E-05	8.10E-05	9.90E-05	5.60E-04	4.70E-04	1.10E-04	3.50E-04	1.60E-04
Radon	1.66E-01	7.89E-02	4.30E-01	1.65E-01	2.80E-01	3.78E-01	1.03E+00	1.44E+00	1.43E-01	3.42E-01	2.01E-01

TABLE F.1-13 (Continued)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knollmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Inorganics (μg/m3)											
Aluminum	1.60E-03	5.80E-05	1.60E-03	7.20E-04	1.20E-03	1.50E-03	8.80E-03	6.80E-03	1.60E-03	4.50E-03	2.20E-03
Antimony	3.40E-06	1.30E-07	3.00E-06	1.40E-06	2.30E-06	2.80E-06	1.50E-05	1.30E-05	3.10E-06	8.50E-06	4.30E-06
Arsenic	2.00E-06	7.40E-08	1.70E-06	8.20E-07	1.30E-06	1.60E-06	9.50E-06	7.40E-06	1.80E-06	5.00E-06	2.50E-06
Barium	2.30E-05	8.10E-07	2.30E-05	1.00E-05	1.80E-05	2.10E-05	1.20E-04	9.70E-05	2.40E-05	6.80E-05	3.30E-05
Beryllium	1.90E-07	6.60E-09	1.80E-07	8.30E-08	1.40E-07	1.70E-07	9.90E-07	8.00E-07	1.80E-07	5.30E-07	2.60E-07
Cadmium	7.70E-07	2.90E-08	7.40E-07	3.40E-07	5.70E-07	6.90E-07	3.70E-06	3.20E-06	7.30E-07	2.00E-06	1.00E-06
Calcium	2.00E-02	7.20E-04	2.00E-02	9.20E-03	1.60E-02	1.90E-02	1.10E-01	9.00E-02	2.10E-02	5.90E-02	2.90E-02
Chromium	3.30E-06	1.20E-07	3.30E-06	1.50E-06	2.50E-06	3.10E-06	1.70E-05	1.50E-05	3.30E-06	9.00E-06	4.50E-06
Cobalt	1.70E-06	6.20E-08	1.60E-06	7.60E-07	1.30E-06	1.50E-06	9.00E-06	7.10E-06	1.70E-06	4.70E-06	2.30E-06
Copper	5.70E-06	2.00E-07	6.10E-06	2.70E-06	4.70E-06	5.70E-06	3.90E-05	2.80E-05	6.00E-06	1.60E-05	8.40E-06
Cyanide	8.70E-08	2.90E-09	9.20E-08	4.10E-08	6.90E-08	8.50E-08	6.00E-07	4.20E-07	9.20E-08	2.60E-07	1.30E-07
Iron	3.20E-03	1.20E-04	3.10E-03	1.40E-03	2.40E-03	2.90E-03	1.80E-02	1.40E-02	3.20E-03	9.00E-03	4.40E-03
Lead	7.20E-05	2.10E-06	8.10E-05	3.60E-05	5.90E-05	7.40E-05	8.00E-04	3.90E-04	8.20E-05	2.30E-04	1.20E-04
Magnesium	4.70E-03	1.70E-04	4.80E-03	2.20E-03	3.70E-03	4.50E-03	2.80E-02	2.20E-02	4.80E-03	1.30E-02	6.70E-03
Manganese	1.70E-04	6.20E-06	1.60E-04	7.50E-05	1.30E-04	1.50E-04	8.90E-04	7.20E-04	1.70E-04	4.70E-04	2.30E-04
Mercury	6.50E-08	2.20E-09	6.60E-08	3.00E-08	5.10E-08	6.20E-08	3.40E-07	2.90E-07	6.80E-08	2.00E-07	9.40E-08
Molybdenum	1.30E-06	4.40E-08	1.30E-06	5.90E-07	1.00E-06	1.20E-06	7.20E-06	5.80E-06	1.30E-06	3.50E-06	1.80E-06
Nickel	3.90E-06	1.40E-07	3.80E-06	1.70E-06	3.00E-06	3.60E-06	2.00E-05	1.70E-05	3.80E-06	1.00E-05	5.30E-06
Potassium	2.10E-04	7.30E-06	2.00E-04	9.10E-05	1.50E-04	1.90E-04	1.10E-03	8.60E-04	2.00E-04	5.60E-04	2.80E-04
Selenium	1.60E-07	5.70E-09	1.40E-07	6.90E-08	1.10E-07	1.40E-07	7.40E-07	5.80E-07	1.60E-07	4.60E-07	2.10E-07
Silicon	3.00E-04	1.10E-05	2.90E-04	1.30E-04	2.30E-04	2.70E-04	1.30E-03	1.30E-03	2.90E-04	7.80E-04	3.90E-04
Silver	1.40E-06	5.00E-08	1.30E-06	6.00E-07	1.00E-06	1.20E-06	7.10E-06	5.50E-06	1.30E-06	3.60E-06	1.80E-06

TABLE F.1-13 (Continued)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knollmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
Sodium	6.80E-05	2.40E-06	6.60E-05	3.10E-05	5.10E-05	6.20E-05	3.30E-04	2.80E-04	6.90E-05	2.00E-04	9.50E-05
Thallium	5.60E-08	2.10E-09	5.50E-08	2.50E-08	4.30E-08	5.10E-08	2.70E-07	2.30E-07	5.40E-08	1.40E-07	7.40E-08
Vanadium	4.10E-06	1.50E-07	4.00E-06	1.80E-06	3.10E-06	3.70E-06	2.20E-05	1.70E-05	4.00E-06	1.10E-05	5.60E-06
Zinc	2.50E-05	9.20E-07	2.80E-05	1.20E-05	2.20E-05	2.60E-05	1.20E-04	1.20E-04	2.50E-05	6.60E-05	3.50E-05
Volatiles/Semivolatiles/PCBs (μg/m3)											
4,4'-DDE	1.30E-11	<1.00E-14	2.30E-11	1.10E-11	1.50E-11	2.00E-11	1.20E-10	7.70E-11	2.10E-11	6.80E-11	3.20E-11
4,4'-DDT	1.70E-11	<1.00E-14	3.60E-11	1.50E-11	2.30E-11	3.10E-11	1.30E-10	1.30E-10	2.60E-11	7.20E-11	3.80E-11
Alpha-chlordane	3.50E-12	<1.00E-14	5.30E-12	2.50E-12	3.50E-12	4.70E-12	2.10E-11	1.70E-11	4.60E-12	1.30E-11	6.70E-12
Aroclor-1254	7.40E-09	<1.00E-14	1.50E-08	6.60E-09	1.00E-08	1.40E-08	6.60E-08	5.90E-08	1.20E-08	3.60E-08	1.70E-08
Aroclor-1260	1.30E-10	<1.00E-14	3.10E-10	1.20E-10	2.00E-10	2.70E-10	9.30E-10	1.20E-09	2.00E-10	5.10E-10	2.80E-10
Benzene	1.10E-12	<1.00E-14	2.60E-12	9.70E-13	1.70E-12	2.30E-12	7.70E-12	1.00E-11	1.70E-12	4.20E-12	2.40E-12
Benzo(a)anthracene	4.10E-09	7.40E-13	9.20E-09	3.80E-09	6.00E-09	8.10E-09	3.50E-08	3.70E-08	6.80E-09	1.90E-08	9.60E-09
Benzo(a)pyrene	4.80E-09	7.80E-13	1.10E-08	4.40E-09	7.10E-09	9.60E-09	4.00E-08	4.40E-08	7.80E-09	2.10E-08	1.10E-08
Benzo(b)fluoranthene	4.90E-09	7.10E-13	1.10E-08	4.40E-09	6.90E-09	9.30E-09	4.00E-08	4.20E-08	7.80E-09	2.10E-08	1.10E-08
Benzo(k)fluoranthene	4.60E-09	7.90E-13	1.00E-08	4.10E-09	6.80E-09	9.20E-09	3.70E-08	4.30E-08	7.30E-09	1.90E-08	1.00E-08
Bis(2-ethylhexyl) phthalate	1.20E-09	9.30E-12	2.30E-09	9.80E-10	1.50E-09	2.10E-09	9.60E-09	9.30E-09	1.80E-09	5.20E-09	2.60E-09
Carbazole	4.10E-10	9.10E-14	9.20E-10	3.70E-10	5.90E-10	8.10E-10	3.90E-09	4.30E-09	6.70E-10	1.80E-09	9.30E-10
Chloroform	5.90E-12	<1.00E-14	1.30E-11	5.20E-12	8.70E-12	1.20E-11	4.40E-11	5.20E-11	9.00E-12	2.40E-11	1.30E-11
Chrysene	4.20E-09	9.80E-13	8.60E-09	3.60E-09	5.60E-09	7.60E-09	3.40E-08	3.40E-08	6.50E-09	1.80E-08	9.30E-09
Dibenzo(a,h)anthracene	1.50E-09	<1.00E-14	3.50E-09	1.40E-09	2.30E-09	3.10E-09	1.30E-08	1.50E-08	2.50E-09	6.60E-09	3.50E-09
Dieldrin	4.30E-12	<1.00E-14	7.00E-12	3.40E-12	4.60E-12	6.20E-12	3.50E-11	2.30E-11	6.50E-12	2.00E-11	9.50E-12
Indeno(1,2,3-cd)pyrene	3.20E-09	5.20E-13	6.70E-09	2.80E-09	4.40E-09	5.90E-09	2.50E-08	2.70E-08	4.90E-09	1.30E-08	7.10E-09
Methylene chloride	8.20E-10	<1.00E-14	2.30E-09	8.60E-10	1.50E-09	2.00E-09	7.80E-09	9.90E-09	1.50E-09	4.00E-09	2.00E-09

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TABLE F.1-13 (Continued)

	Crosby Elementary	Morgan Elementary	Elda Elementary	St. Johns Elementary	Ross Middle High School	Ross Country Day Nursery	Knollmann Dairy Farm	East (near the Great Miami River)	South (near the Great Miami River)	Paddys Run Road	Town of Fernald
N-nitroso-di-n-propylamine	2.20E-11	<1.00E-14	5.00E-11	1.90E-11	3.30E-11	4.40E-11	1.50E-10	2.00E-10	3.30E-11	8.30E-11	4.60E-11
N-nitrosodiphenylamine	7.20E-10	<1.00E-14	1.10E-09	4.90E-10	7.40E-10	9.80E-10	3.70E-09	3.60E-09	9.00E-10	2.40E-09	1.30E-09
Octachlorodibenzo-p-dioxin	6.00E-13	<1.00E-14	9.80E-13	4.20E-13	6.50E-13	8.70E-13	3.20E-12	3.40E-12	7.70E-13	2.00E-12	1.10E-12
Octachlorodibenzofuran	2.80E-13	<1.00E-14	6.50E-13	2.40E-13	4.20E-13	5.70E-13	1.90E-12	2.50E-12	4.20E-13	1.10E-12	5.90E-13
Tetrachloroethene	1.40E-03	6.90E-13	1.70E-03	6.70E-04	1.20E-03	1.60E-03	3.80E-03	5.20E-03	1.20E-03	2.70E-03	1.60E-03
Trichloroethene	2.70E-03	4.50E-13	3.40E-03	1.30E-03	2.40E-03	3.10E-03	7.50E-03	1.00E-02	2.40E-03	5.50E-03	3.30E-03

TABLE F.1-14

COMPARISON OF RADON CONCENTRATIONS AT AIR MONITORING STATIONS TO ISCLT MODEL RESULTS AT SAME LOCATIONS

AMS	*AMS Concentrations (pCi/m^3)	ISCLT Modeling Results (pCi/m^3)
1	400	3.32
2	400	3.69
4	400	0.87
6	400	1.44
7	1500	0.98

* From Environmental Monitoring Report, 1992.

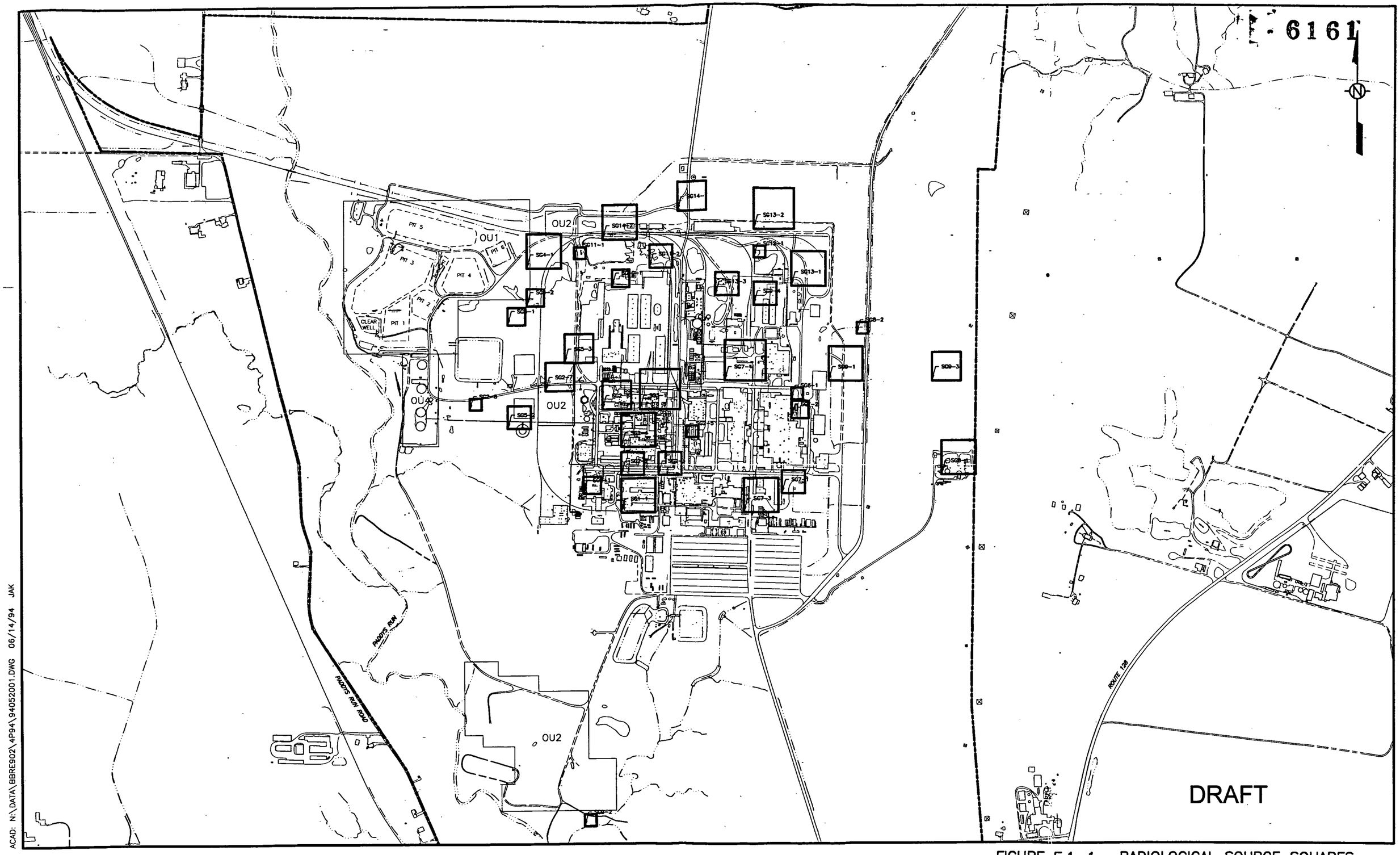

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FIGURE F.1–1. RADIOLOGICAL SOURCE SQUARES FOR OPERABLE UNIT 5

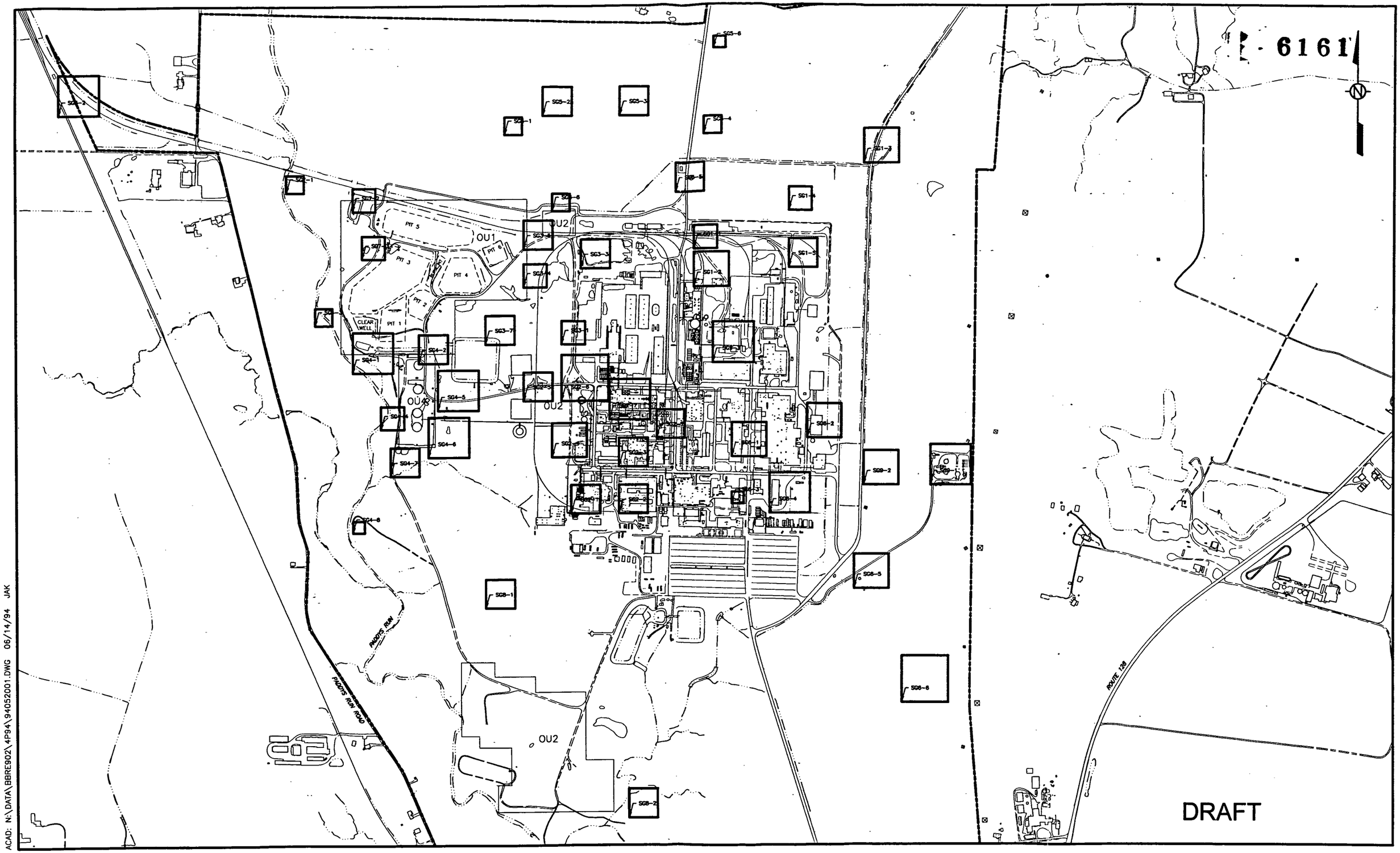

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FIGURE F.1-2. INORGANIC SOURCE SQUARES FOR OPERABLE UNIT 5

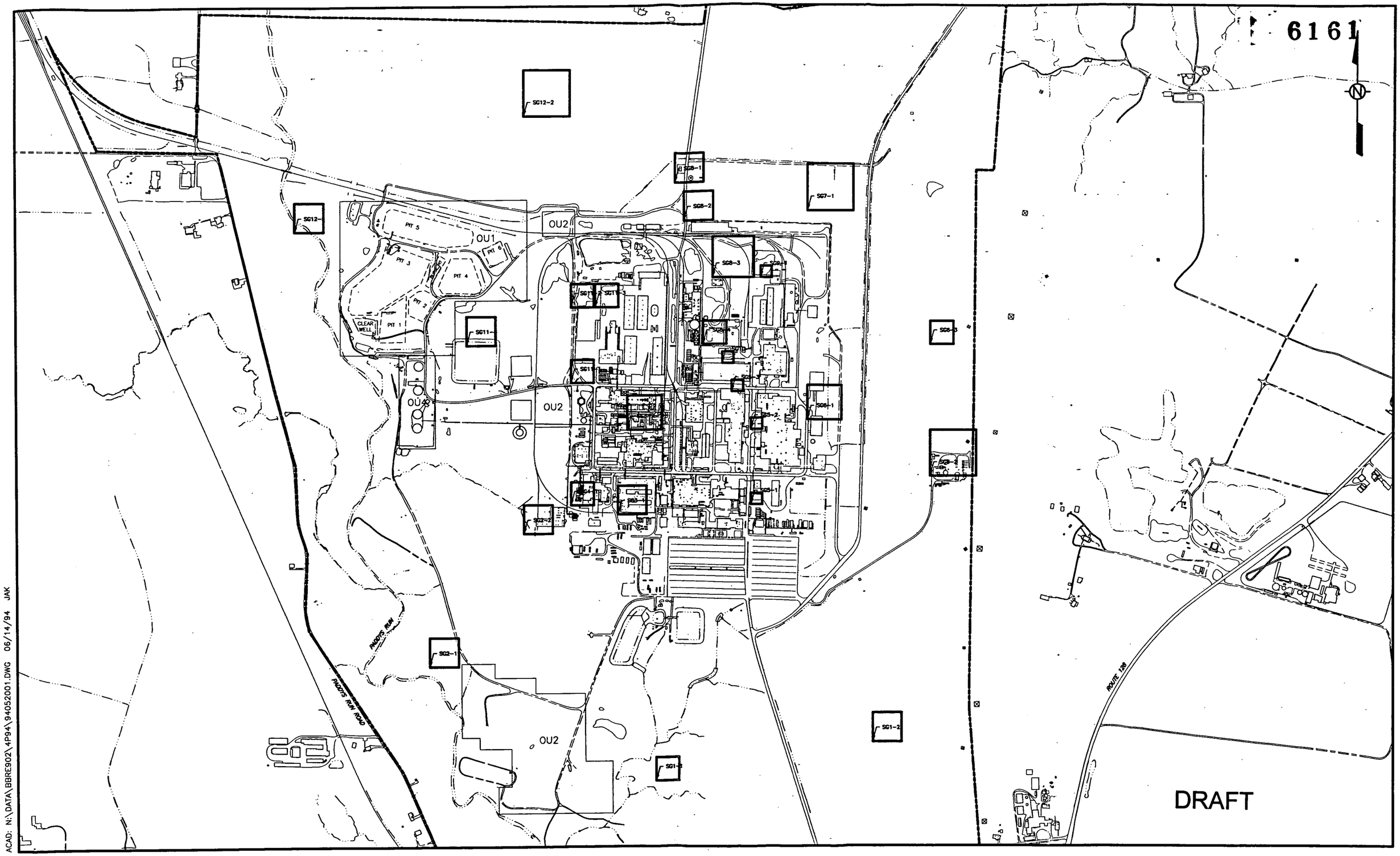

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FIGURE F.1-3. ORGANIC SOURCE SQUARES FOR OPERABLE UNIT 5

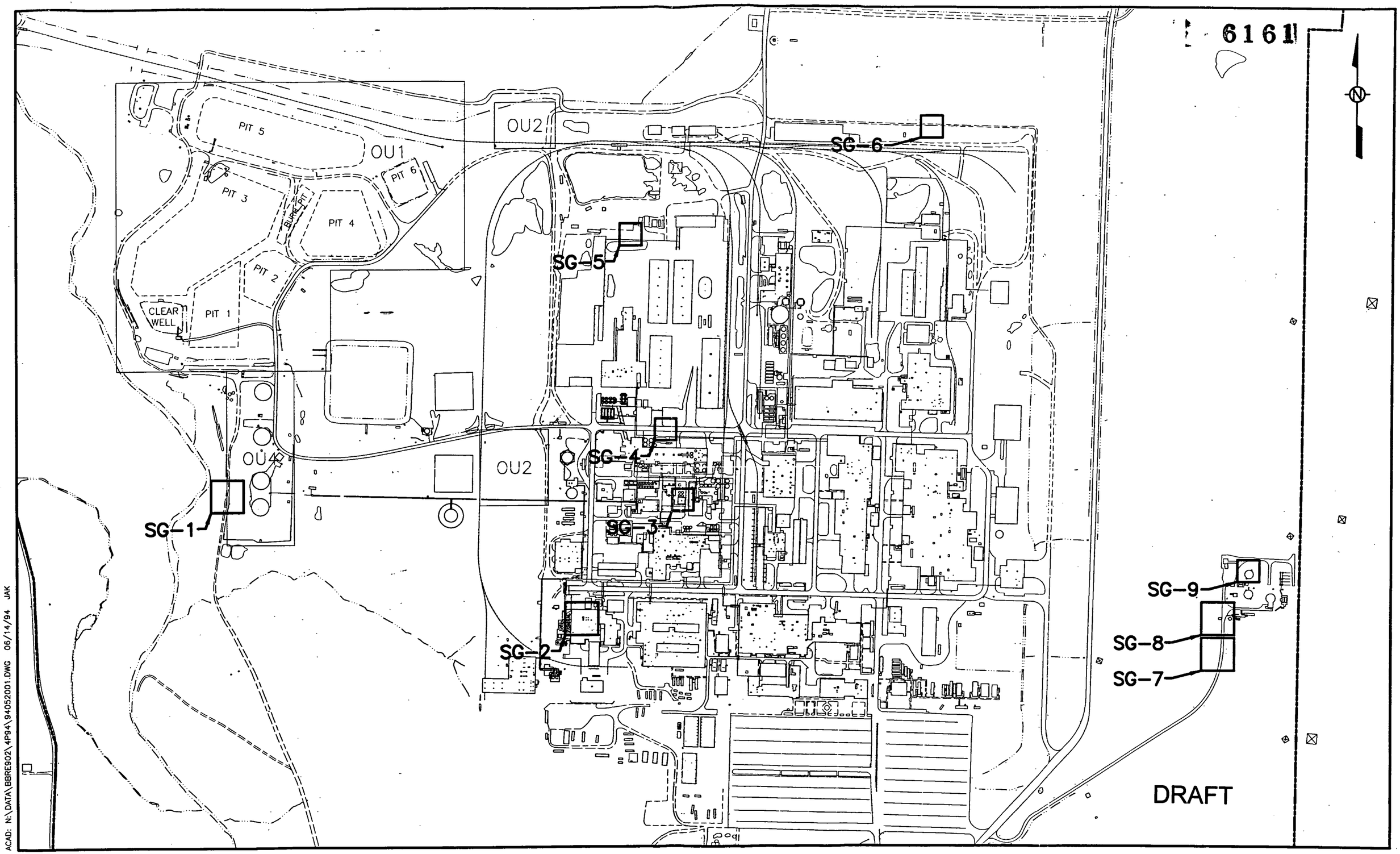

FIGURE F.1-4. RADON SOURCE SQUARES FOR OPERABLE UNIT 5

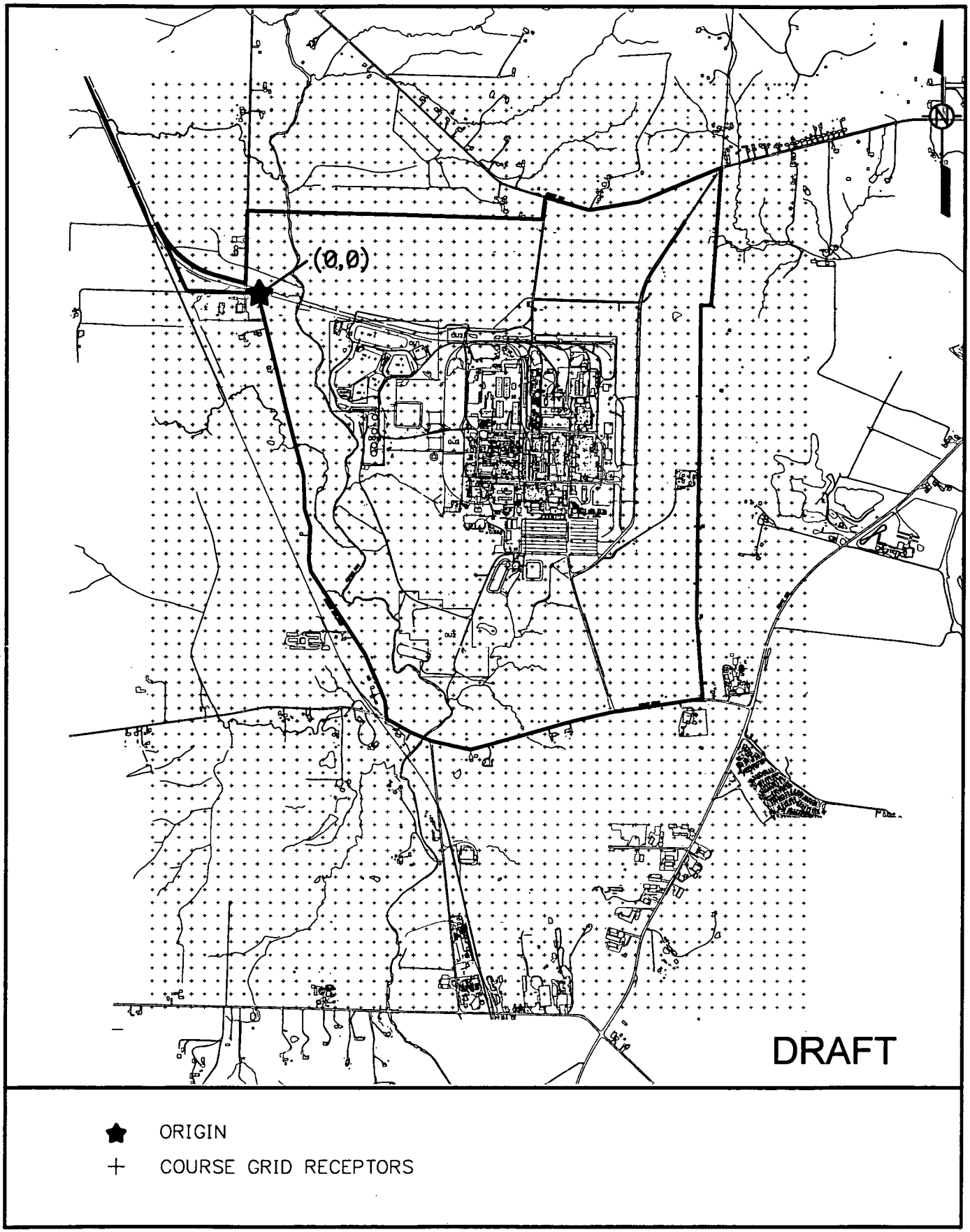

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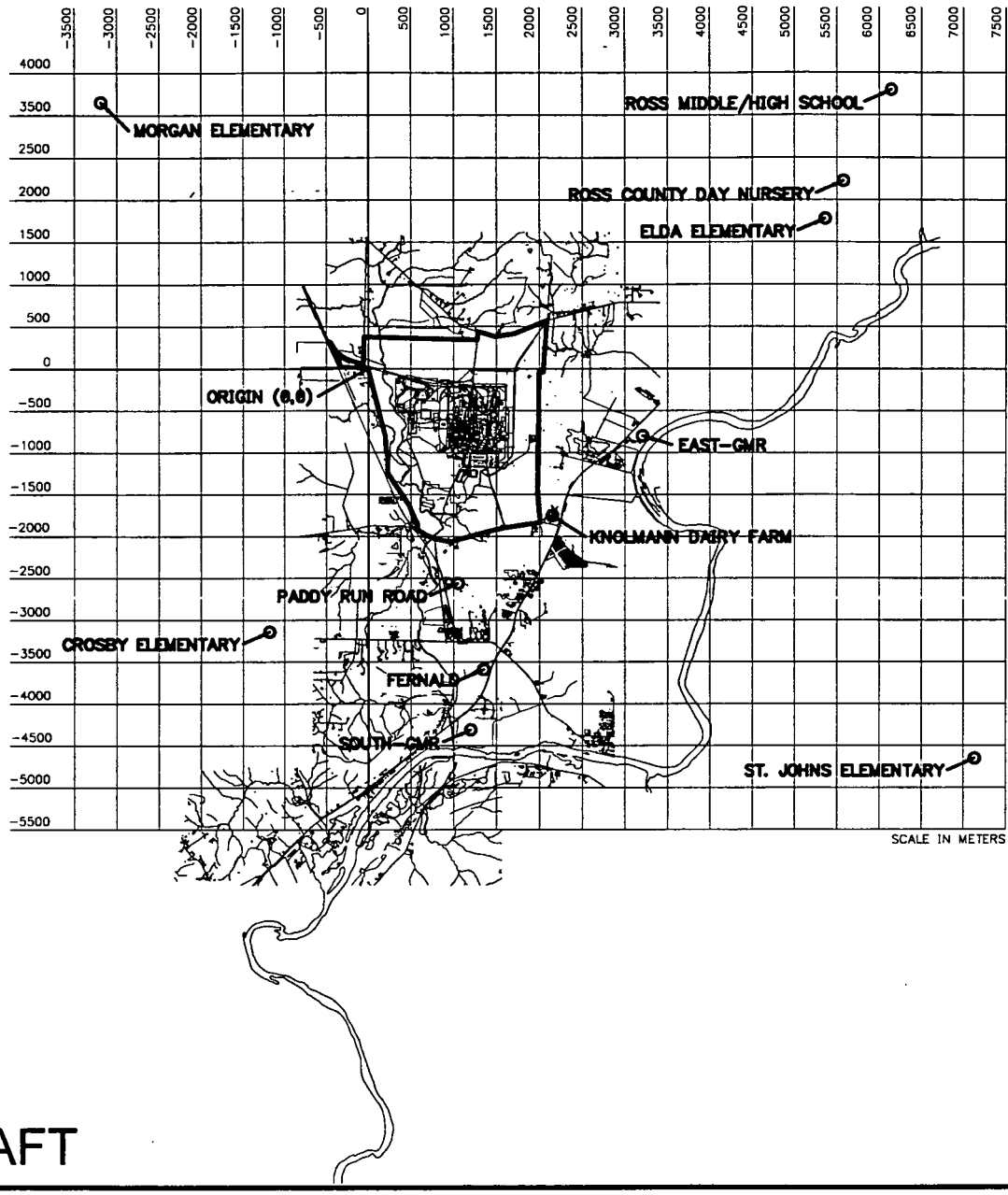
FIGURE F.1-5 OPERABLE UNIT 5 CARTESIAN RECEPTOR GRID



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LEGEND :

O DISCRETE RECEPTORS

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FIGURE F.1-6 OPERABLE UNIT 5 DISCRETE RECEPTOR LOCATIONS

ATTACHMENT F.1-I

Wind Erosion Emission Rate Calculations

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CALCULATION WORKSHEET Order No. 19116 (01-91)

PAGE 1 OF 1

CLIENT FEMP OU-5	JOB NUMBER
SUBJECT Wind erosion emission rates	
BASED ON 85% Vegetative Cover	DRAWING NUMBER
BY Wagner / CHECKED BY MS 5/17/94	APPROVED BY / DATE 5/16/94

Using EPA publication "Rapid Assessment of exposure to particulate emissions from Surface Contamination Sites", determine wind erosion from surfaces with limited erosion potential. (assume 85 vegetative cover and 59 μ particle diameters, see Attachment F.1-III for particle diameter calculations.)

$$E_{10} = 0.83 \frac{f\ P(u^+)(1-V)}{(PE/50)^2}$$

where:

E_{10} = PM_{10} emission factor (mg/m²-hr)
f = frequency of disturbance / month
u^+ = fastest mile of wind (m/s); Table 4-1*
$P(u^+) = 6.7(u^+ - u_t)$ (g/m²); u_t = TFV (m/s)
V = Vegetative cover
PE = Thornwaite's Precipitation Evaporation Index *Figure 4-2

$f = 1$
$u^+ = 24$ m/s
$P(u^+) = 6.7(24\ m/s - .20\ m/s)$
$V = 85\%$ cover
$PE = 103$

therefore:

$$E_{10} = 0.83 \frac{1(159.5)(1-.85)}{(103/50)^2}$$

$$= 0.83 \frac{(23.9)}{4.24}$$

$$= 4.67\ mg/m^2\text{-}hr \left(\frac{hr}{3600\ s}\right) \frac{10^{-3}\ g}{mg}$$

$$= 1.3 \times 10^{-6}\ g/m^2\text{-}s$$

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CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT FEMP OUS	JOB NUMBER
SUBJECT Wind erosion emission rates (Unlimited Potential)	
BASED ON 50% Vegetative Cover	DRAWING NUMBER
BY Wagner / CHECKED BY MS 5/17/94	APPROVED BY / DATE 5/16/94

Using *EPA Publication, "Rapid Assessment of exposure to particulate emissions from surface Contamination Sites", determine wind erosion emission rates from surface with Unlimited Erosion Potential, assume 50% vegetative cover.

$$E_{10} = 0.036(1-V)\left(\frac{[u]}{u_{7m}}\right)^3 F(x)$$

E_{10} = PM_{10} emission factor (g/m^2-hr)

V = Vegetative cover
[u] = mean wind speed (m/s) Table 4-1*
u_{7m} = $u_*/0.4 \ln(z/z_0)$
x = $0.886\, u_t/[u]$
F(x) = *Figure 4-3.

V = 50% = .50
[u] = 4.6 m/s
u_* = .20 m/s From *Figure 3-4 using Aggregate Size Distribution of 59 μm. or .059 mm.
x = 0.886 (.20/4.6) = 0.039 ⇒ F(x) = 1.91 *Figure 4-3
z = height above surface (cm)
z_0 = roughness height (cm) (assume 1cm) *Figure 3-6

therefore:

$$u_{7m} = \frac{.20\,m/s}{.4} \ln\left(\frac{700\,cm}{1\,cm}\right)$$

$$= 3.27\,m/s$$

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CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT FEMP OUS		JOB NUMBER	
SUBJECT Wind erosion emission rate (Unlimited Potential)			
BASED ON 59 μm, 50% vegetative cover		DRAWING NUMBER	
BY Wagner	CHECKED BY MS 5-17-94	APPROVED BY	DATE 5/16/94

$$E_{10} = 0.036\,(1-.5)\left(\frac{4.6\ m/s}{3.27\ m/s}\right)^3 1.91$$

$$= (0.096\ g/m^2\text{-}h\cancel{r})\left(\frac{\cancel{hr}}{3600s}\right)$$

$$= \underline{\underline{2.66 \times 10^{-5}\ g/m^2\text{-}s}}$$

* EPA Publication, "Rapid Assessment of Exposure to Particulate Emission from Surface Contamination Sites.

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TABLE 4-1. FASTEST MILE[a] [u^+] AND MEAN WIND SPEED[b] [u] FOR SELECTED UNITED STATES STATIONS

Station	State	[u^+] (m/s)	[u] (m/s)	Station	State	[u^+] (m/s)	[u] (m/s)
Birmingham	AL	20.8	3.3	Detroit	MI	21.8	4.6
Montgomery	AL	20.2	3.0	Grand Rapids	MI	21.6	4.5
Tucson	AZ	23.0	3.7	Lansing	MI	23.7	4.6
Yuma	AZ	21.8	3.5	Sault St. Marie	MI	21.6	4.3
Fort Smith	AR	20.8	3.4	Duluth	MN	22.8	5.1
Little Rock	AR	20.9	3.6	Minneapolis	MN	22.0	4.7
Fresno	CA	15.4	2.8	Jackson	MS	20.5	3.4
Red Bluff	CA	23.3	3.9	Columbia	MO	22.4	4.4
Sacramento	CA	20.6	3.7	Kansas City	MO	22.6	4.6
San Diego	CA	15.4	3.0	St. Louis	MO	21.2	4.2
Denver	CO	22.0	4.1	Springfield	MO	22.4	5.0
Grand Junction	CO	23.6	3.6	Billings	MT	26.6	5.1
Pueblo	CO	28.1	3.9	Great Falls	MT	26.4	5.9
Hartford	CT	20.2	4.0	Havre	MT	25.9	4.5
Washington	DC	21.6	3.4	Helena	MT	24.7	3.5
Jacksonville	FL	21.7	3.8	Missoula	MT	21.6	2.7
Tampa	FL	22.2	3.9	North Platte	NE	27.7	4.6
Atlanta	GA	21.2	4.1	Omaha	NE	24.6	4.8
Macon	GA	20.1	3.5	Valentine	NE	27.1	4.8
Savannah	GA	21.3	3.6	Ely	NV	23.6	4.7
Boise	ID	21.4	4.0	Las Vegas	NV	24.4	4.0
Pocatello	ID	23.8	4.6	Reno	NV	25.2	2.9
Chicago	IL	21.0	4.6	Winnemucca	NV	22.4	3.5
Moline	IL	24.5	4.4	Concord	NH	19.2	3.0
Peoria	IL	23.2	4.6	Albuquerque	NM	25.6	4.0
Springfield	IL	24.2	5.1	Roswell	NM	26.0	4.1
Evansville	IN	20.9	3.7	Albany	NY	21.4	4.0
Fort Wayne	IN	23.7	4.6	Binghampton	NY	22.0	4.6
Indianapolis	IN	24.8	4.3	Buffalo	NY	24.1	5.5
Burlington	IA	25.0	4.6	New York	NY	22.5	5.5
Des Moines	IA	25.8	5.0	Rochester	NY	23.9	4.3
Sioux City	IA	25.9	4.9	Syracuse	NY	22.5	4.4
Concordia	KS	25.7	5.4	Cape Hatteros	NC	25.9	5.1
Dodge City	KS	27.1	6.3	Charlotte	NC	20.0	3.4
Topeka	KS	24.4	4.6	Greensboro	NC	18.9	3.4
Wichita	KS	26.0	5.6	Wilmington	NC	22.3	4.0
Louisville	KY	22.0	3.8	Bismarck	ND	26.1	4.7
Shreveport	LA	19.9	3.9	Fargo	ND	26.6	5.7
Portland	ME	21.7	3.9	Cleveland	OH	23.6	4.8
Baltimore	MD	25.0	4.2	Columbus	OH	22.1	3.9
Boston	MA	25.2	5.6	Dayton	OH	24.0	4.6

TABLE 4-1 (concluded)

Station	State	$[u^+]$ (m/s)	[u] (m/s)	Station	State	$[u^+]$ (m/s)	[u] (m/s)
Toledo	OH	22.7	4.2	Dallas	TX	21.9	4.9
Oklahoma City	OK	24.1	5.7	El Paso	TX	24.8	4.2
Tulsa	OK	21.4	4.7	Port Arthur	TX	23.7	4.5
Portland	OR	23.5	3.5	San Antonio	TX	21.0	4.2
Harrisburg	PA	20.4	3.4	Salt Lake City	UT	22.6	3.9
Philadelphia	PA	22.1	4.3	Burlington	VT	20.4	3.9
Pittsburgh	PA	21.6	4.2	Lynchburg	VA	18.3	3.5
Scranton	PA	19.9	3.8	Norfolk	VA	21.8	4.7
Huron	SD	27.4	5.3	Richmond	VA	18.9	3.4
Rapid City	SD	27.3	5.0	Quillayute	WA	16.3	3.0
Chattanooga	TN	21.4	2.8	Seattle	WA	18.7	4.1
Knoxville	TN	21.8	3.3	Spokane	WA	21.4	3.9
Memphis	TN	20.3	4.1	Green Bay	WI	25.3	4.6
Nashville	TN	20.9	3.6	Madison	WI	24.9	4.4
Abilene	TX	24.4	5.4	Milwaukee	WI	24.0	5.3
Amarillo	TX	27.3	6.1	Cheyenne	WY	27.0	5.9
Austin	TX	20.2	4.2	Lander	WY	27.4	3.1
Brownsville	TX	19.5	5.3	Sheridan	WY	27.5	3.6
Corpus Christi	TX	24.4	5.4	Elkins	WV	22.8	2.8

[a] Data taken from Extreme Wind Speeds at 129 Stations in the Contiguous United States. Simiu, E., Filliben, J. J., and M. J. Changery. NBS Building Science Series 118. U.S. Department of Commerce, National Bureau of Standards, 1979.

[b] Data taken from Local Climatological Data - Annual Summaries for 1977. U.S. Department of Commerce, National Oceanic and Atmospheric Administration/Environmental Data Service/National Climatic Data Center.

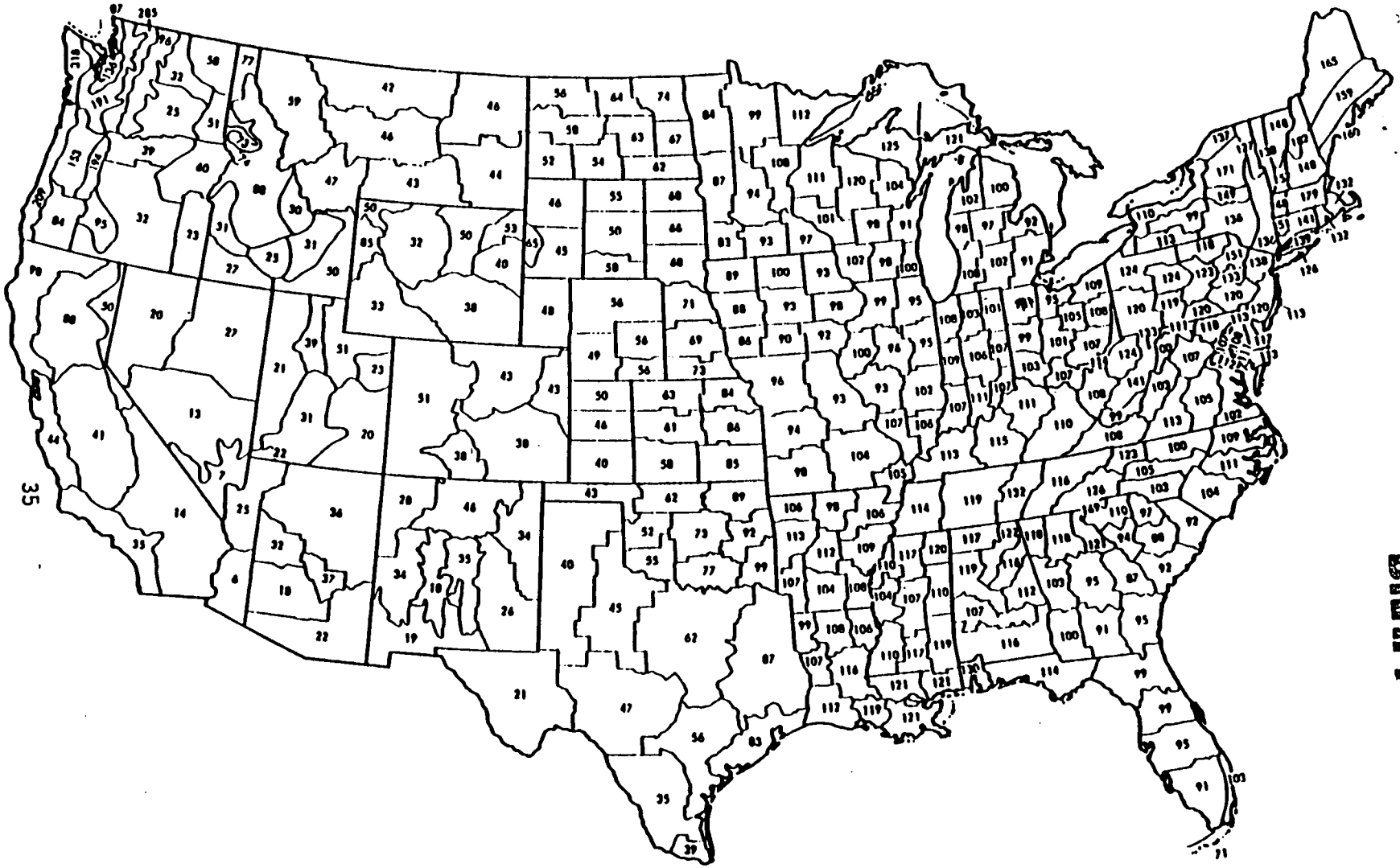

Figure 4-2. Map of P-E Index for State Climatic Divisions

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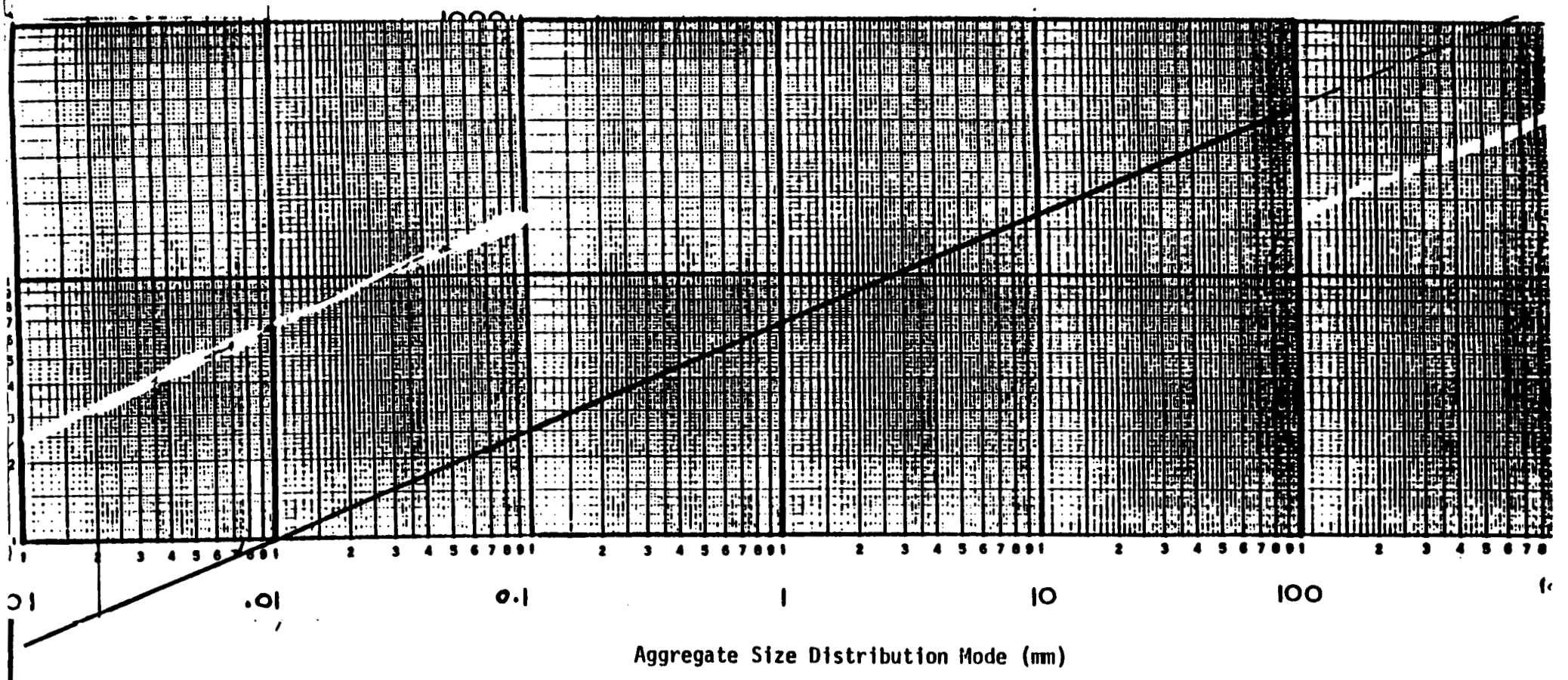

Figure 3-4. Relationship of Threshold Friction Veloc
to Size Distribution Mode

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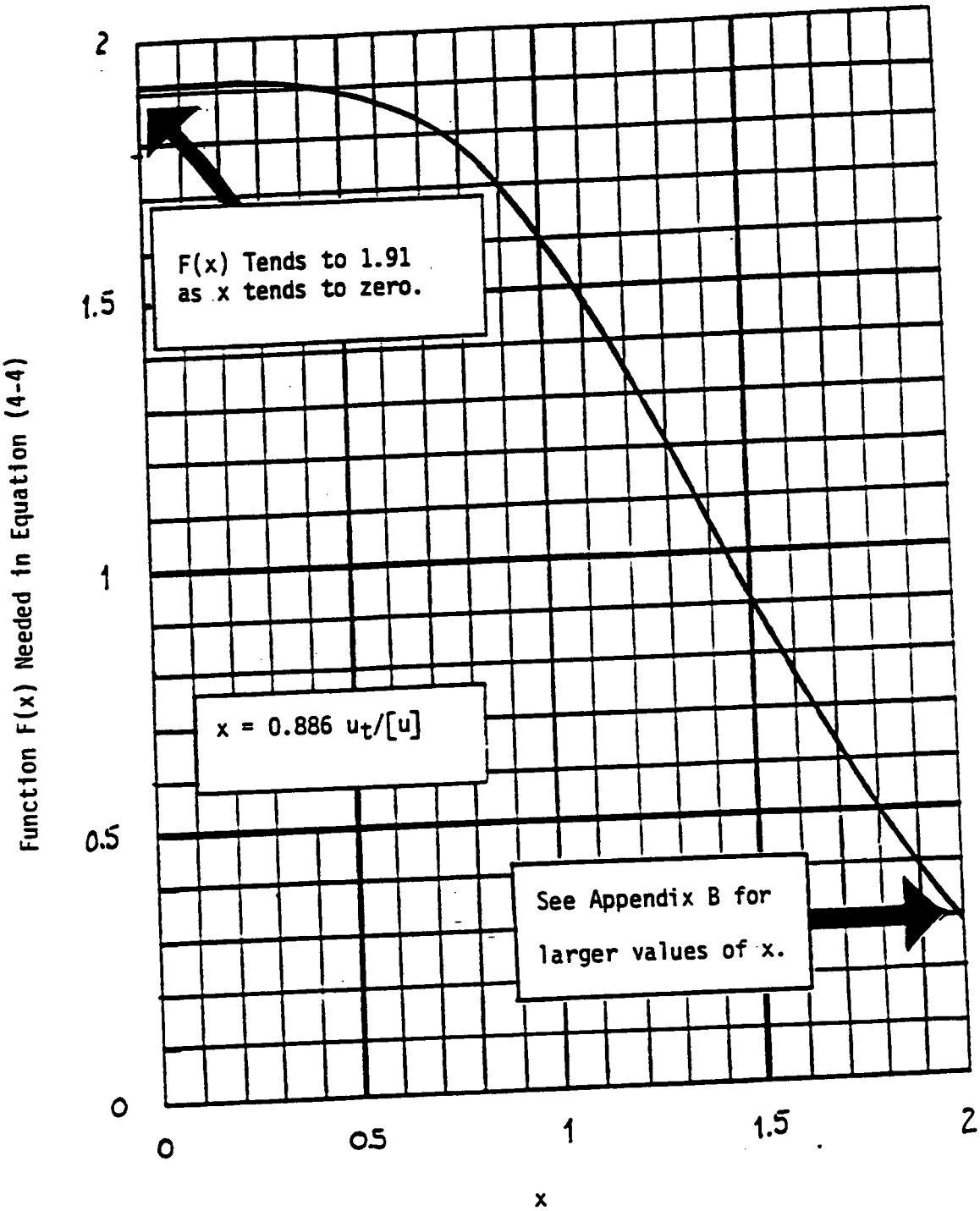

Figure 4-3. Graph of Function F(X) Needed to Estimate Unlimited Erosion

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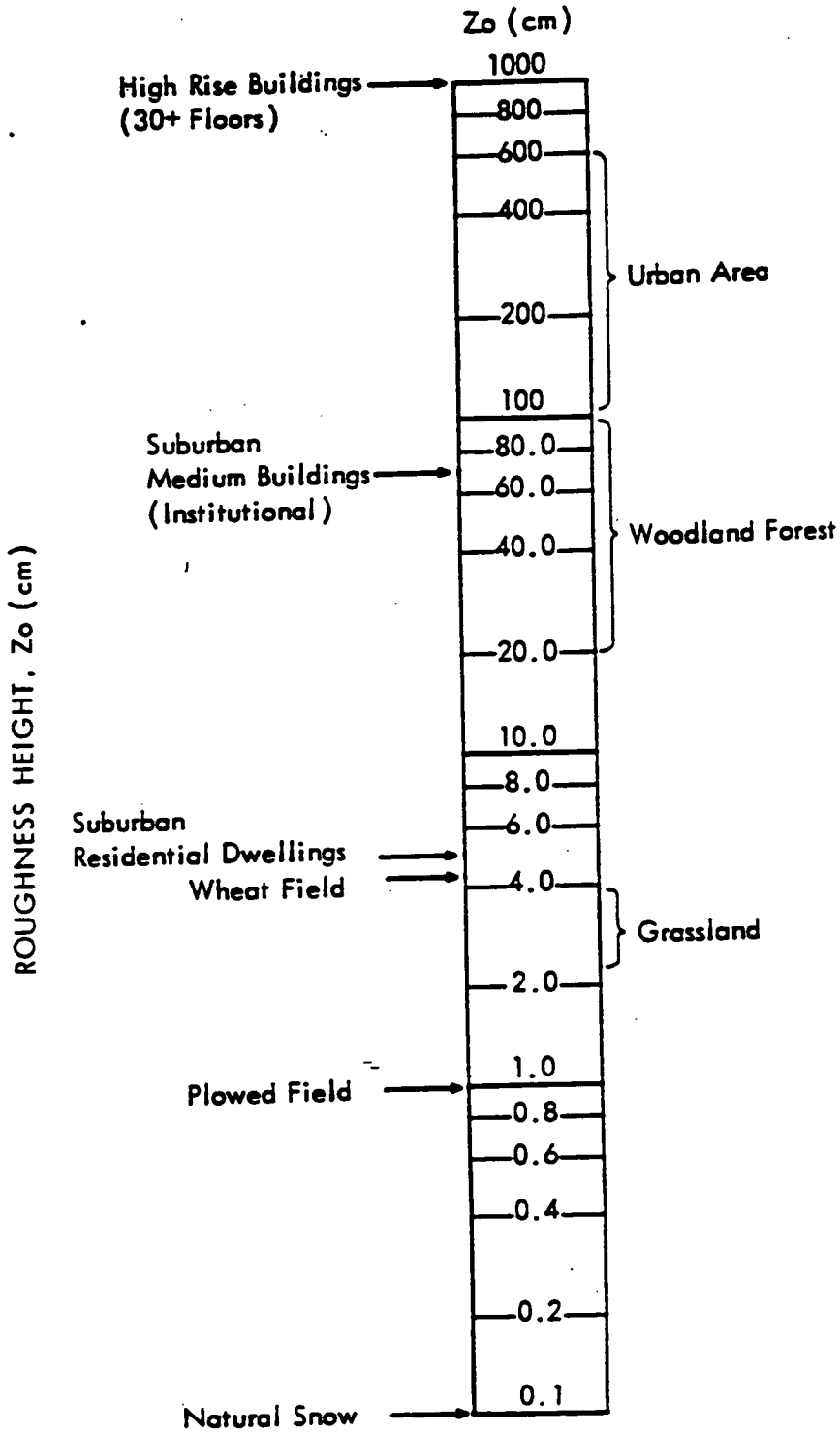

Figure 3-6. Roughness Heights for Various Surfaces (Cowherd and Guenther, 1976)

F.1.II Attachment

ATTACHMENT F.1-II

Radon Flux Rate Calculations

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT FEMP OU-5	JOB NUMBER NG96 SARN1
SUBJECT Radon Flux rates from OU5 Radon Sources	
BASED ON	DRAWING NUMBER
BY Wagner / CHECKED BY	APPROVED BY / DATE 5/19/94

From "Radon Attenuation Handbook for Uranium Mill Tailings Cover Design" NUREG/CR-3533 PNL-4878, RAE-18-5 April 1984, provides an equation for calculating the radon flux rate from a bare tailing pile to be:

$$J_t = 10^4 R \rho_t E \left(\sqrt{\lambda DC_t}\right) \tanh \sqrt{\frac{\lambda}{DC_t}} x_t$$

where R = radium concentration (pCi/g)

ρ_t = dry bulk density (g/cm^3)

E = radon emanation coefficient (unitless)

λ = radiological decay constant for radon $= 2.1 \times 10^{-6} s^{-1}$

DC_t = radon diffusion coefficient (cm^2/s)

x_t = thickness of tailings (cm)

DC_t must be calculated by using

$$DC_t = 0.07 \exp\left[-4(m - Mp^2 + m^5)\right]$$

where m = fraction of saturation (unitless)

p = soil porosity assume to be 0.41

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CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT FEMP OU5	JOB NUMBER NG96 5ARN1
SUBJECT Radon emission flux rate calculations	
BASED ON	DRAWING NUMBER
BY Wagner / CHECKED BY [illegible]	APPROVED BY / DATE 5/19/94

m can be calculated by

$$m = \left[.124(p)^{1/2} - 0.0012E - 0.04 + 0.156\, f_{cm}\right]$$

where

p = annual precipitation (inches)
= 40 inches (OU-LCD)

E = annual lake evaporation (inches)
= 34 inches (Climate Atlas of U.S.)

f_{cm} = fraction of soil passing through a 200 mesh sieve, (see below)

Calculate f_{cm} by using sieve analysis data provided for OU-2, since no data from OU5 exists.

Subunit	% passing through #200 sieve (sfc soils)
Inactive Flyash	47
South Field	71
Solid Waste Landfill	74
	192/3 = 64%

f_{cm} = .64

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CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT FEMP OU5		JOB NUMBER N696 SARN1	
SUBJECT Radon emission flux rate calculations			
BASED ON		DRAWING NUMBER	
BY Wagner	CHECKED BY Logan	APPROVED BY	DATE 5/19/94

$$m = \left[.124(40)^{1/2} - 0.0012(34) - 0.04 + 0.156(.64)\right]$$

$$= .7842 - .0408 - 0.04 + .0998$$

$$= \underline{.8032}$$

$$DC_t = 0.07 \exp\left[-4\left(.8032 - .8032(0.41)^2 + (.8032)^5\right)\right]$$

$$= 0.07 \exp\left[-4\left[(.8032) - (.1350) + (.3343)\right]\right]$$

$$= 0.07(.0181)$$

$$= \underline{0.0013}$$

Subsitute values into Radon flux equation:

$$J_t = 10^4 (R)\, \rho_t E (\lambda DC_t)^{1/2} \tanh\left(\frac{\lambda}{DC_t}\right)^{1/2} x_t \quad \text{where:}$$

R = in soil concentrations for $Radium_{226}$

ρ_t = dry bulk density of soil (from OU-2, OU-1 use average density for surface soils from OU-2 subunits. of 2.67 g/cm³.

E = radon emanation coefficient, assume 0.22

λ = decay constant for radon of $2.1 \times 10^{-6}\ s^{-1}$

DC_t = 0.0011

x_t = thickness of tailings, use 6 inches (15.2 cm) of surface soil

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CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT FEMP OU5	JOB NUMBER
SUBJECT Radon emission flux rate calculations	
BASED ON	DRAWING NUMBER
BY Wagner / CHECKED BY MS	APPROVED BY / DATE 5/19/94

$$J_t = R\left[10^4\left(2.67\frac{g}{cm^3}\right)(0.22)\left[(2.1\times10^{-6}s^{-1})(.0013)\right]^{-1/2}\tanh\left(\left(\frac{2.1\times10^{-6}s^{-1}}{.0013}\right)^{1/2}15.2\,cm\right)\right]$$

$$J_t = R(.1671)$$

Radon Source	*Concentration R(pCi/g)	Flux Rate J_t (pCi/m²-s)
1	34.7	5.8
2	8.0	1.3
3	6.9	1.1
4	16.6	2.8
5	2720.0	452.6
6	2950.0	490.9
7	10.3	1.7
8	27.6	4.6
9	5.1	0.8

* R = Ra_{226} in soil concentrations

ATTACHMENT F.1-III

Calibration of Particulate Matter Emission Estimates and ISCLT2 Model Results with Monitored Fenceline Air Quality Data

CALIBRATION OF PARTICULATE MATTER EMISSION ESTIMATES AND ISCLT2 MODEL RESULTS WITH MONITORED FENCELINE AIR QUALITY DATA

INTRODUCTION

This report describes a brief study conducted to calibrate the fugitive dust emission model and air dispersion model used to predict emission impacts from the FEMP with monitored FEMP property line (fenceline) air contaminant concentrations. The objective of this study was to verify that the air dispersion model used to predict emission impacts from the site was appropriate for the FEMP and to determine an appropriate particulate matter emission rate for the site based on actual air quality data collected around the site. This report presents the methods used to estimate particulate matter emission rates, the results of air dispersion modeling for the site, and the monitored data used to calibrate the emission and dispersion estimates.

PARTICULATE MATTER EMISSION ESTIMATES

Particulate matter emission estimates for windblown fugitive dust from FEMP surface soils are based on methods presented in *Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites*, EPA/600/8-85/002 (EPA 1985). The methods presented in this document have been adopted by EPA for assessing baseline fugitive dust emissions from Superfund sites (EPA 1992).

The fugitive dust emission model assumes that the wind speed necessary to resuspend surface soil must be greater than a minimum wind speed, defined as the threshold friction velocity (u_t^*). This velocity is dependent on the aerodynamic modal diameter of the surface soil. In addition to u_t^*, the erosion potential of surface soil is dependent on the presence of nonerodible elements (elements with diameters typically greater than 1 cm) in the soil, the crust-forming characteristics of the soil, the soil moisture content, and the amount of vegetative cover that can be supported by the soil (EPA 1985).

The dust emission methodology assumes that the erosion potential of a surface can be defined as "limited" or "unlimited". A surface with limited erosion potential has a finite quantity of loose material available on an otherwise hard surface (e.g., bedrock or crusted soil). A high wind event will resuspend the loose material and remove it from the immediate area. After the high wind event, the surface may be nonerodible until new material is deposited or (in the case of a crusted surface) the surface crust is disturbed or broken by some mechanical or natural means. A surface with unlimited erosion potential

has an (assumed) infinite quantity of loose material available for resuspension by the wind. The methodology for estimating the unlimited erosion emission rate assumes that this material is relatively dry and does not form a crust. The modal diameter of the soil, used to determine u_t^*, and the crustiness of the surface soil are significant parameters in determining the limited or unlimited erosion potential.

The threshold friction velocity can be determined from the aerodynamic modal diameter as follows (based on EPA 1985):

$$\log u_t^* = 1.812 + (0.4161) \log (d_p), \qquad (1)$$

where u_t^* = threshold friction velocity (cm/s) measured at the roughness height, z_o, and
d_p = aerodynamic modal of surface soil (mm).

A site survey can be conducted to determine the crustiness of the surface soil.

The equation developed to estimate the limited erosion potential emission rate is reproduced below (EPA 1985):

$$E_{10} = 0.83 \, (f) \, P(u^+) \, (1-V) \, / \, (PE/50)^2, \qquad (2)$$

where E_{10} = annual average inhalable particulate matter (PM_{10}) emission flux from surface soil ($mg/hr/m^2$),
f = frequency of disturbance per month,
u^+ = observed (or probable) fastest mile of wind for the period between disturbances (m/s),
$P(u^+)$ = erosion potential, the quantity of erodible elements present on the surface prior to onset of wind erosion (g/m^2),
V = fraction of surface covered by continuous vegetation, and
PE = Thornthwaite's Precipitation Index used as a measure of average soil moisture content.

The erosion potential, $P(u^+)$, in Equation 2 is linearly dependent on the threshold friction velocity as follows:

$$P(u^+) = 6.7 \, (u^+ - u_t), \quad \text{for } u^+ > u_t \qquad (3)$$
$$= 0, \quad \text{for } u^+ \leq u_t$$

where u_t = threshold friction velocity (m/s) measured at the same elevation above ground as the fastest mile of wind.

The equation developed to estimate the unlimited erosion potential emission rate is presented below (EPA 1985):

$$E_{10} = 0.036\ (1-V)\ [u / u_t]^3\ F(y), \qquad (4)$$

where u = annual average wind speed at the site (m/s),
u_t = threshold friction velocity (m/s) measured at the same elevation above ground as the annual average wind speed,
y = $0.866\ (u_t / u)$,
$F(y)$ = 1.91, for $y < 0.5$,
= See Figure 1 (from EPA 1985), for $0.5 < y < 2$, and
= $0.18\ (8y^3 + 12y)\ \exp(-y^2)$, for $y > 2$.

The unlimited erosion potential has a nonlinear dependence on the threshold friction velocity.

A comparison of the impact that the threshold friction velocity has on each type of erosion potential is presented in Figure 2. The following assumptions were used to develop Figure 2:

- u^+ = 24 m/s (from EPA 1985, for Dayton, Ohio),
- f = 1 disturbance per month,
- V = 0.85 (from DOE 1993a, for FEMP),
- PE = 103 (from EPA 1985, for southwestern Ohio),
- z_o = 0.03 cm (from EPA 1985, for grassland), and
- u = 2.28 m/s (from DOE 1993a, for FEMP).

Correcting the threshold friction velocity estimated at the surface roughness height (from Equation 1) to the measurement height of the fastest mile of wind or annual average wind speed is made as follows (EPA 1985):

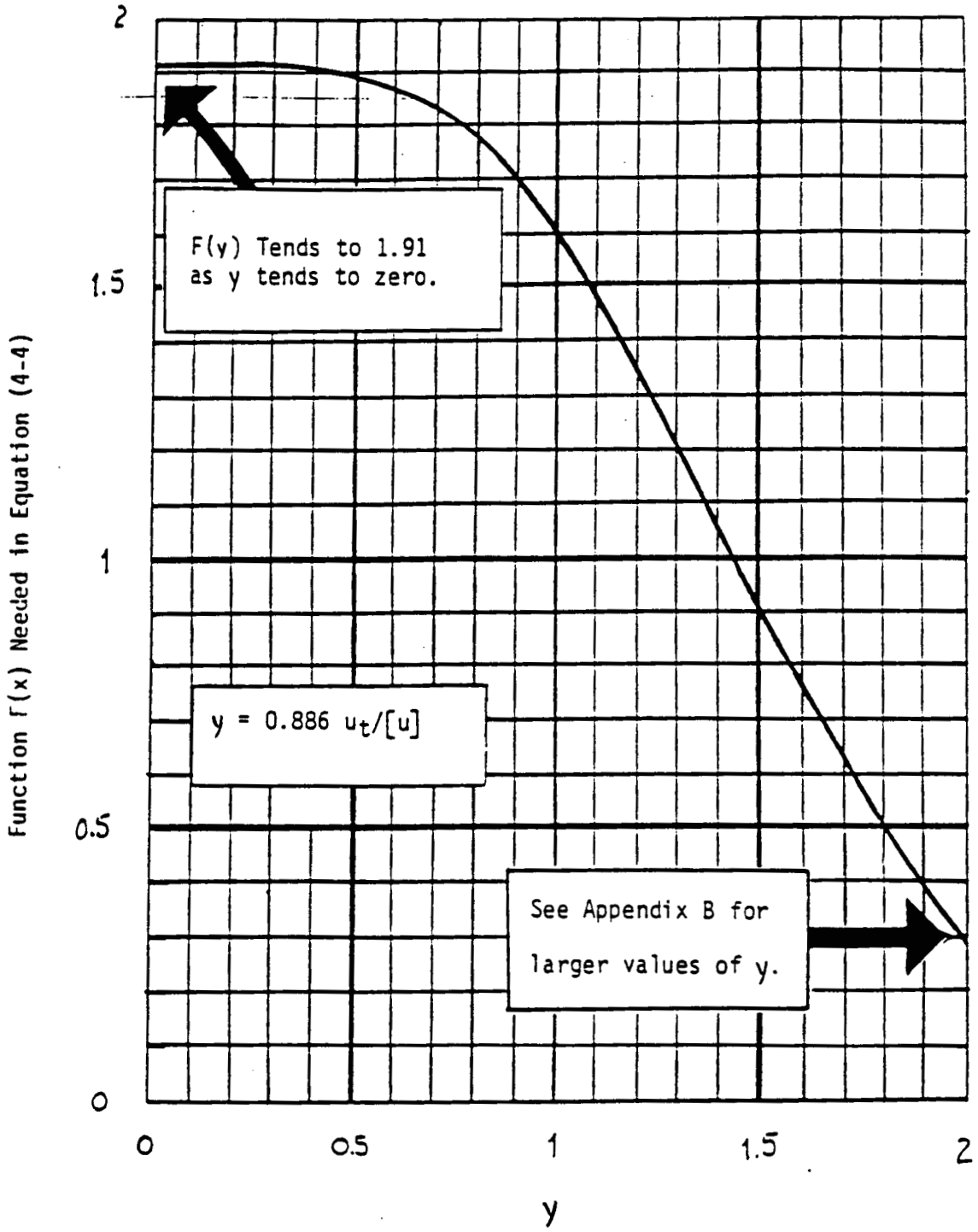
$$u_t = (u_t^* / 0.4)\ \ln\ (z / z_o), \qquad (5)$$

where u_t = threshold friction velocity at measurement height of other wind speed (m/s),
u_t^* = threshold friction velocity at surface roughness height (m/s),
z = measurement height of other wind speed (m),
= 7 m for u^+,
= 10 m for u,
z^o = surface roughness height (m).

AIR DISPERSION MODELING

The maximum fenceline airborne dust concentration was modeled with ISCLT2 in a previous study (Fluor Daniel 1994) presented in Attachment I. That study used the limited erosion emission model with an 85 percent vegetative cover and a 0.021 mm surface soil modal diameter. The estimated emission rate was 1.21×10^{-6} g/s/m^2 (4.36 mg/hr/m^2) and the resulting maximum fenceline concentration was 22.4 μg/m^3 (Fluor Daniel 1994). That study assumed that only FEMP soils contributed to the fenceline dust concentration.

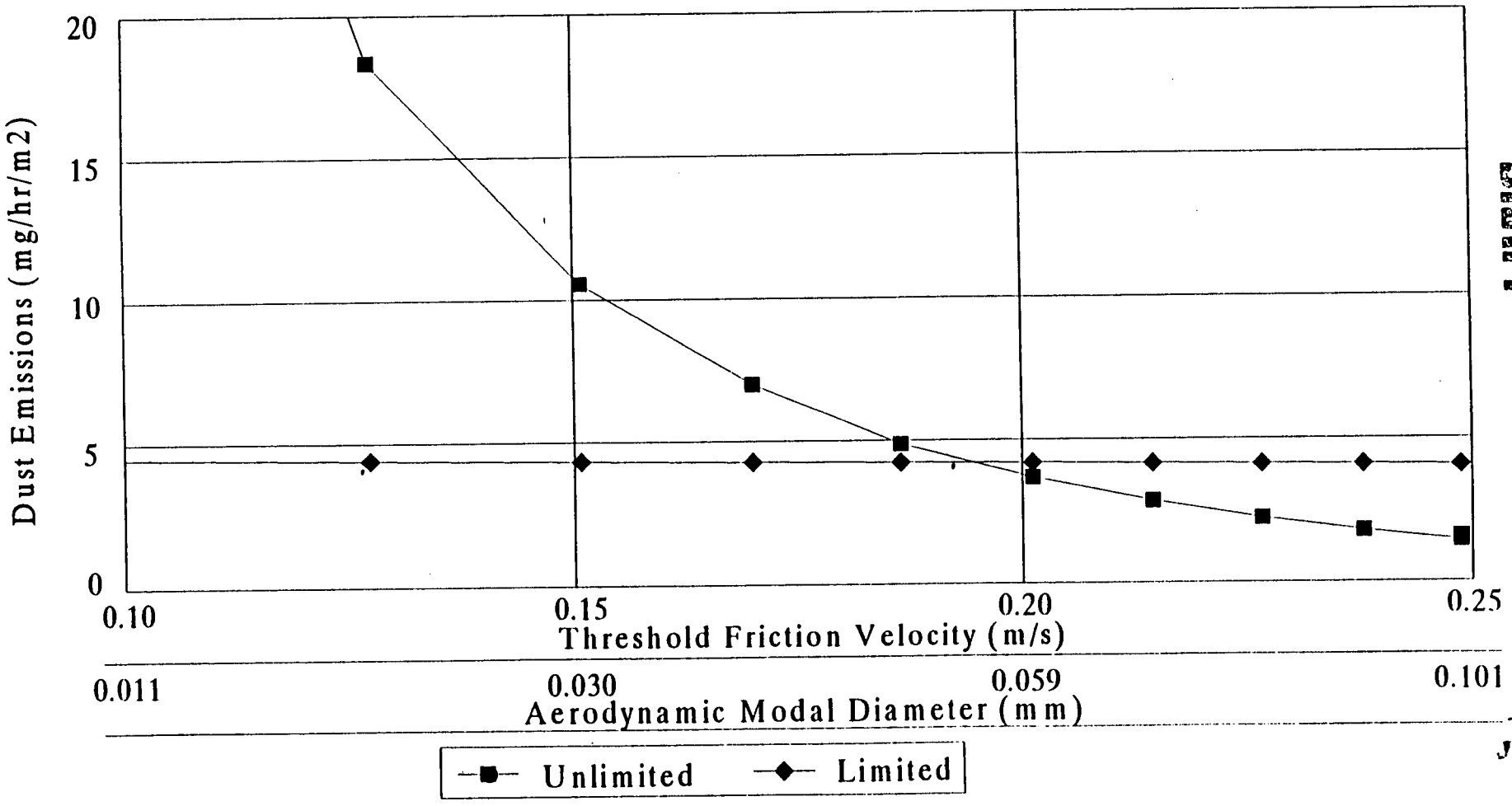
Figure 1. Graph of Function F(y) Needed to Estimate Unlimited Erosion



Source: EPA 1985.

Figure 2.

Dust Emissions vs. Threshold Friction Velocity & Modal Diameter



Source: EPA 1985.

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COMPARISON OF MODELED RESULTS TO AIR MONITORING STATION DATA

The FEMP maintains seven fenceline air quality monitoring stations around the site. The monitoring locations are presented in Figure 3. The total uranium concentrations in air and in surface soil at these stations were compared to the air dispersion modeling results. The monitored data was obtained from the *1992 Fernald Site Environmental Report*, FEMP-2290, Special UC-707 (DOE 1993b).

A review of Figure 3 in Fluor Daniel (1994) indicates that the relative ranking of the monitoring locations based on airborne dust concentrations should be:

(1) Station 3 (highest)
(2) Stations 1 and 2 (approximately equal)
(3) Station 6
(4) Station 4
(5) Stations 5 and 7 (approximately equal and lowest)

This ranking exactly matches the 1992 annual average air concentrations of uranium presented in the Environmental Report (DOE 1993b). Therefore, the ISCLT2 model can be assumed to produce accurate relative emission impacts for the FEMP. This statement means that the shape of the modeled annual average concentration isopleths produced by ISCLT2 should be similar to the shape of actual annual average concentration isopleths.

To compare the absolute value of the airborne dust concentrations, the monitored dust concentrations are needed. These data were not directly presented in the Environmental Report. However, the dust concentrations could be estimated by assuming that the uranium soil concentration at each monitoring station (DOE 1993b) was equal to the uranium concentration in the airborne particulate matter collected at that station. The airborne dust concentration (g/m^3) was determined by dividing the airborne uranium concentration (pCi/m^3) by the uranium soil concentration (pCi/g). The results for each monitoring station are presented in Table 1.

The highest dust concentration estimated from monitored uranium concentrations was 20 $\mu g/m^3$, at Air Monitoring Station 2 (AMS 2). This compares well with the maximum modeled fenceline concentration of 22.4 $\mu g/m^3$ (approximately 12 percent error). The 20 $\mu g/m^3$ value also compares well with the typical airborne dust concentration around the United States. A mean value of 15.5 $\mu g/m^3$ was reported by DOE from 46 sampling locations in the United States (ORNL 1984, see Figure 4).

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TABLE 1. FENCELINE DUST CONCENTRATION ESTIMATES

Fenceline Monitoring Station No.	Measured U Conc. in Air (pCi/m^3)[a]	Measured U Conc. in Soil (pCi/g)[b]	Estimated Airborne Dust Conc. (g/m^3)[c]
AMS 1	1.2×10^{-4}	1.1×10^{1}	1.1×10^{-5}
AMS 2	1.1×10^{-4}	5.6×10^{0}	2.0×10^{-5}
AMS 3	1.7×10^{-4}	2.6×10^{1}	6.5×10^{-6}
AMS 4	3.6×10^{-5}	3.9×10^{0}	9.2×10^{-6}
AMS 5	3.2×10^{-5}	4.5×10^{0}	7.1×10^{-6}
AMS 6	5.3×10^{-5}	5.3×10^{0}	1.0×10^{-5}
AMS 7	3.1×10^{-5}	1.3×10^{1}	2.4×10^{-6}

Source: DOE 1993b.

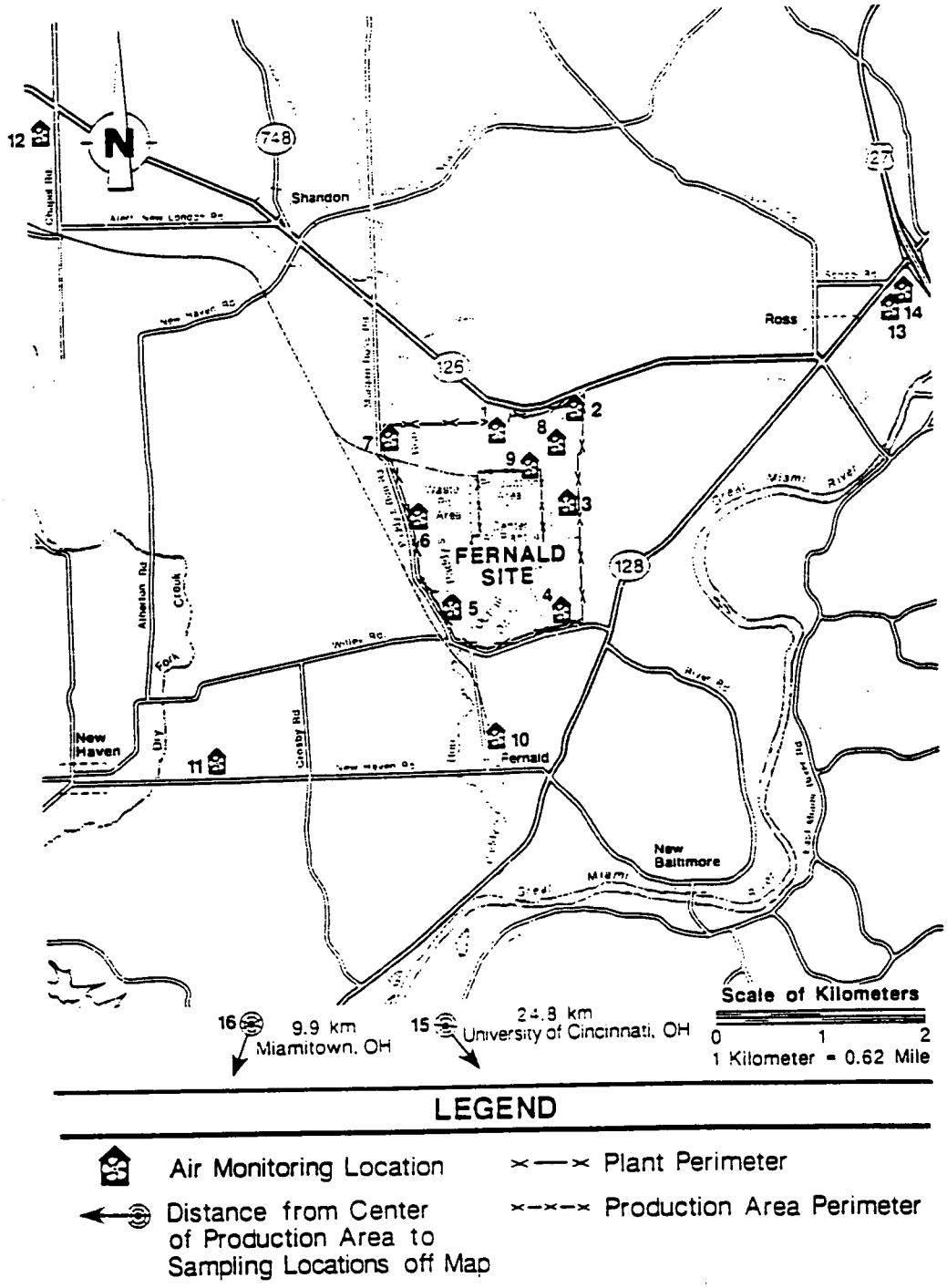
[a]Corrected for background.
[b]Values presented are for top 5 cm of soil.
[c]Assumed that dust concentration represented PM^{10} concentration.

FUTURE AIR DISPERSION MODELING

The FEMP is currently obtaining surface soil samples to determine the aerodynamic modal diameter. These sampling results can be used to develop FEMP-specific emission rates. Until these data are available, the monitored data can be used to back-calculate the FEMP particulate matter emissions rate. The significant assumption used to calculate the emission rate is that all airborne dust concentrations reported at the monitoring station originated from the FEMP. This assumption will continue to produce conservative emission estimates since the monitoring station would collect dust emissions from offsite sources as well (e.g., agricultural tilling).

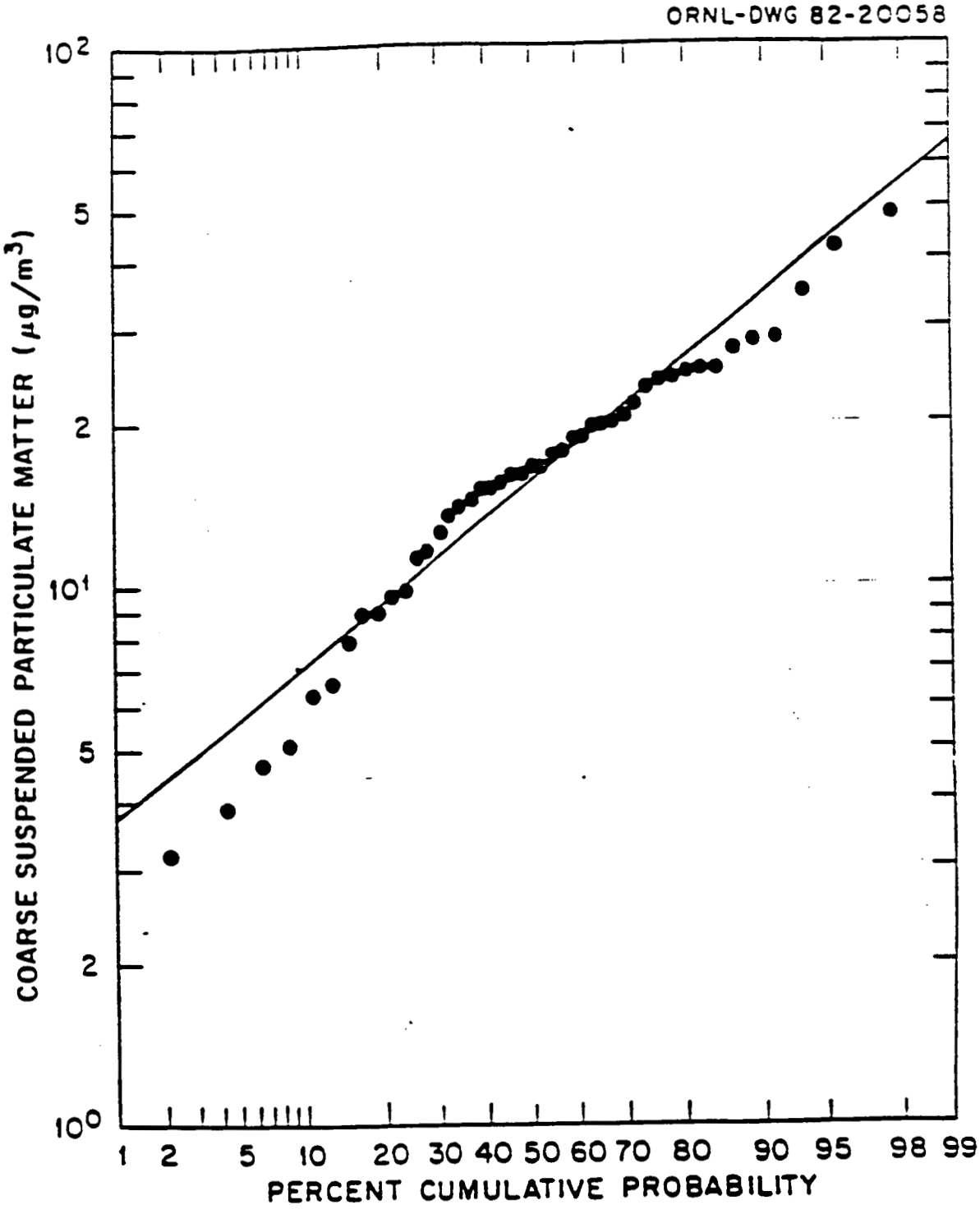
Assuming a maximum fenceline concentration of 20 $\mu g/m^3$, the fugitive dust emission rate from the FEMP should be approximately 3.82 mg/hr/m^2 (1.06×10^{-6} g/s/m^2). This emission rate corresponds to a threshold friction velocity of 0.20 m/s at the roughness height and, for the unlimited erosion potential model, a modal diameter of 0.059 mm. The emission rate estimated here should represent an upper bound for FEMP soils with an 85 percent vegetative cover. The sampling results can be used to adjust the FEMP emission rate downward but should not be used to increase the emission rate. This statement is made in light of the fact that other offsite sources will actually contribute to the monitored fenceline dust concentration.

Figure 3. Air Monitoring Locations



Source: DOE 1993b

Figure 4. Lognormal Probability Plot of Coarse Suspended Particulate Matter



Source: ORNL 1984.

REFERENCES

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ATTACHMENT I

Preliminary Air Impact Assessment for Off-Property Receptor PRG Development

FLUOR DANIEL

Fluor Daniel, Inc.
3333 Michelson Drive, Irvine CA 92730
(714) 975-2000

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March 24, 1994

Operable Unit 5 Feasibility Study
Fernald Environmental Management Project
Fluor Daniel Contract 04424331-5AFS1

Mr. Kenneth A. Broberg
CERCLA/RCRA Unit 5
Fernald Environmental Management Project
7400 Willey Road
Fernald, Ohio 45030

Dear Ken:

Preliminary Air Impact Assessment
for Off-Property Receptor PRG Development

At the request of J.D. Chiou, Fluor Daniel has completed a very brief study of Operable Unit 5 airborne particulate matter impacts at the FEMP property line. The results of this study are presented in the attached report. These results may be useful in determining off-property receptor PRG values.

The results of this assessment indicate the particulate matter concentrations at the property line could range from 8.47×10^{-6} g/m^3 (if only OU5 areas with ≥ 50 pCi/g U-238 in surface soil are included) to 2.24×10^{-5} g/m^3 (if OU5 areas with ≥ 10 pCi/g U-238 in surface soil are included).

The property line concentrations from this study are significantly higher than the average concentration (2.03×10^{-6} g/m^3) currently being used to determine on-property receptor PRG values. This inconsistency may make demonstrating compliance with off-property receptor risk criteria difficult without additional air modeling.

Please call me at (714) 975-5688 if you have questions regarding this assessment.

Sincerely,

John R. Pehrson
Senior Environmental Engineer

JRP:
Attachment

cc: J.D. Chiou, Brown&Root - Pittsburgh

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PRELIMINARY ASSESSMENT OF AIRBORNE PARTICULATE MATTER CONCENTRATIONS AT THE FEMP PROPERTY LINE FROM OPERABLE UNIT 5 SURFACE SOIL FOR PRG DEVELOPMENT

This preliminary assessment was conducted to rapidly determine the sensitivity of PM_{10} concentrations at the FEMP property line to Operable Unit 5 emission source sizes and locations. This assessment simply compares the maximum property line PM_{10} concentrations for two sets of potential source areas: 1) areas with surface soil U-238 concentrations > 10 pCi/g, and 2) areas with surface soil U-238 concentrations > 50 pCi/g.

The area designations used for previous surface water drainage studies were also used in this air modeling assessment. Figure 1 (attached) presents the areas designations used in the model. The areas used as sources for each model run are identified in Table 1

TABLE 1
SOURCE AREAS FOR PM_{10} AIR EMISSIONS

Areas > 10 pCi	Areas > 50 pCi/g	Areas Not Modeled
560 b,c	560 c	560 a[a]
570 a,b,c,d,e	570 e	580 a[a]
575 a,b	575 b	581 a[a]
581 b,c,d	581 d	AFP[b]
582 b	PA a,b,c,d,e,f,g,h	LSP[b]
PA a,b,c,d,e,f,h,g,i		SF[b]
WPA a		SWL[b]
		WPA ou1,ou4[b]

[a]Areas with < 10 pCi/g U-238 in surface soil.
[b]Areas belonging to other operable units (1, 2, or 4).

Emission rates were determined using the limited erosion potential model (EPA 1985) and assuming 85 percent vegetative cover. The emission rate equation is presented below:

$$E_{10} = 0.83\ f\ P(u^{+})\ (1-V)\ /\ (PE/50)^{2} \qquad (1)$$

where E_{10} = PM_{10} emission factor, the annual average PM_{10} emission flux from surface soil ($mg/m^2/hr$),
f = frequency of disturbance per month,
u^+ = observed (or probable) fastest mile of wind for the period between disturbances (m/s),
$P(u^+)$ = erosion potential, the quantity of erodible particles present on the surface prior to the onset of wind erosion (g/m^2),
V = fraction of surface area covered by continuous vegetation, and
PE = Thornwaite's Precipitation Index used as a measure of average soil moisture content.

The erosion potential in Equation 1 depends on the fastest mile as follows:

$$P(u^+) = 6.7\,(u^+ - u_t), \text{ for } u^+ \geq u_t \qquad (2)$$

where u_t = erosion threshold wind speed measured at the meteorological station sensor height (m/s).

If $u_t > u^+$, then $P(u^+)$ is zero.

The threshold wind speed is dependent on the aggregate size distribution mode of the surface soil. This dependency can be expressed as (from EPA 1985):

$$\log (u_t^*) = 1.812 + 0.4161 \log d_p \qquad (3)$$

where u_t^* = threshold wind speed at the roughness height (cm/s), and
d_p = modal diameter of soil (mm).

The threshold wind speed at the roughness height is corrected to the station sensor height by:

$$u_t = u_t^+ \,(1/0.4) \ln (z/z_o) \qquad (4)$$

where z = station sensor height (m), and
z_o = roughness height (m).

The actual parameters used in Equations 1 through 4 to calculated particulate matter emission rates are presented in Table 2.

TABLE 2
PARAMETERS USED TO CALCULATE PARTICULATE MATTER EMISSION RATES

Parameter	Value	Parameter	Value	Parameter	Value
f =	1 / month	u^- =	24 m/s (EPA 1985)	z =	7 m (EPA 1985)
V =	0.85	d_p =	0.021 mm	z_o =	0.03 m (EPA 1985) for grass
PE =	103 (EPA 1985)				

Substituting these values into Equations 1 through 4 results in the following calculated values:

u_t^* = 0.13 m/s,

u_t = 1.77 m/s,

$P(u^+)$ = 148.93 g/m^2, and

E_{10} = 4.37 mg/hr/m^2 = $\underline{1.21 \times 10^{-6}\ g/s/m^2}$.

The numerical results of each model run are presented in Table 3. The results area presented graphically in Figures 2 and 3 (attached). These results indicate the inclusion of the areas with ≥ 10 pCi/g U-238 in the surface soil increases the property line PM_{10} concentration by roughly a factor of 2.5. The major contributing areas to the property line impacts are 581b, 581d, and 581c when all areas ≥ 10 pCi/g are analyzed. When only the areas ≥ 50 pCi/g are modeled, the major contributing area is 581d.

TABLE 3
MAXIMUM PROPERTY LINE PM_{10} AIR CONCENTRATIONS

	Location (FEMP Coord. System)		Concentration	
Case	East (ft)	North (ft)	(g/m^3)	Major Contributor
≥50 pCi/g	6800	-2400	8.47E-06	Area 581d (Sewage Treatment Plant), 53%
≥10 pCi/g	6814	-2280	2.24E-05	Area 581b (Soil between former PA and east property line), 84%

U.S. Environmental Protection Agency (EPA), 1985, "Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites," EPA/600/8-85/002, Office of Health and Environmental Assessment, U.S. EPA, Washington, DC.

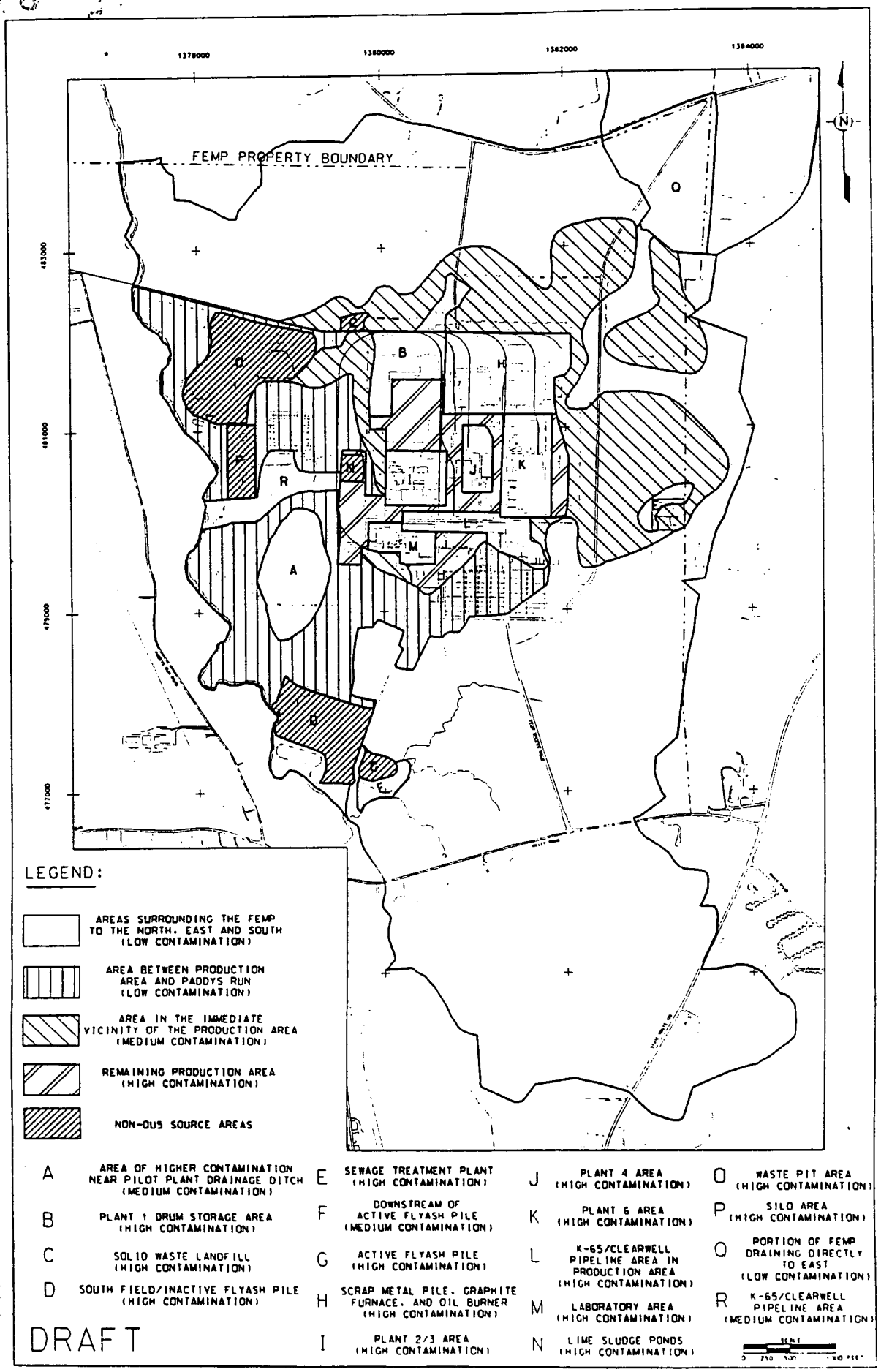

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FIGURE 1

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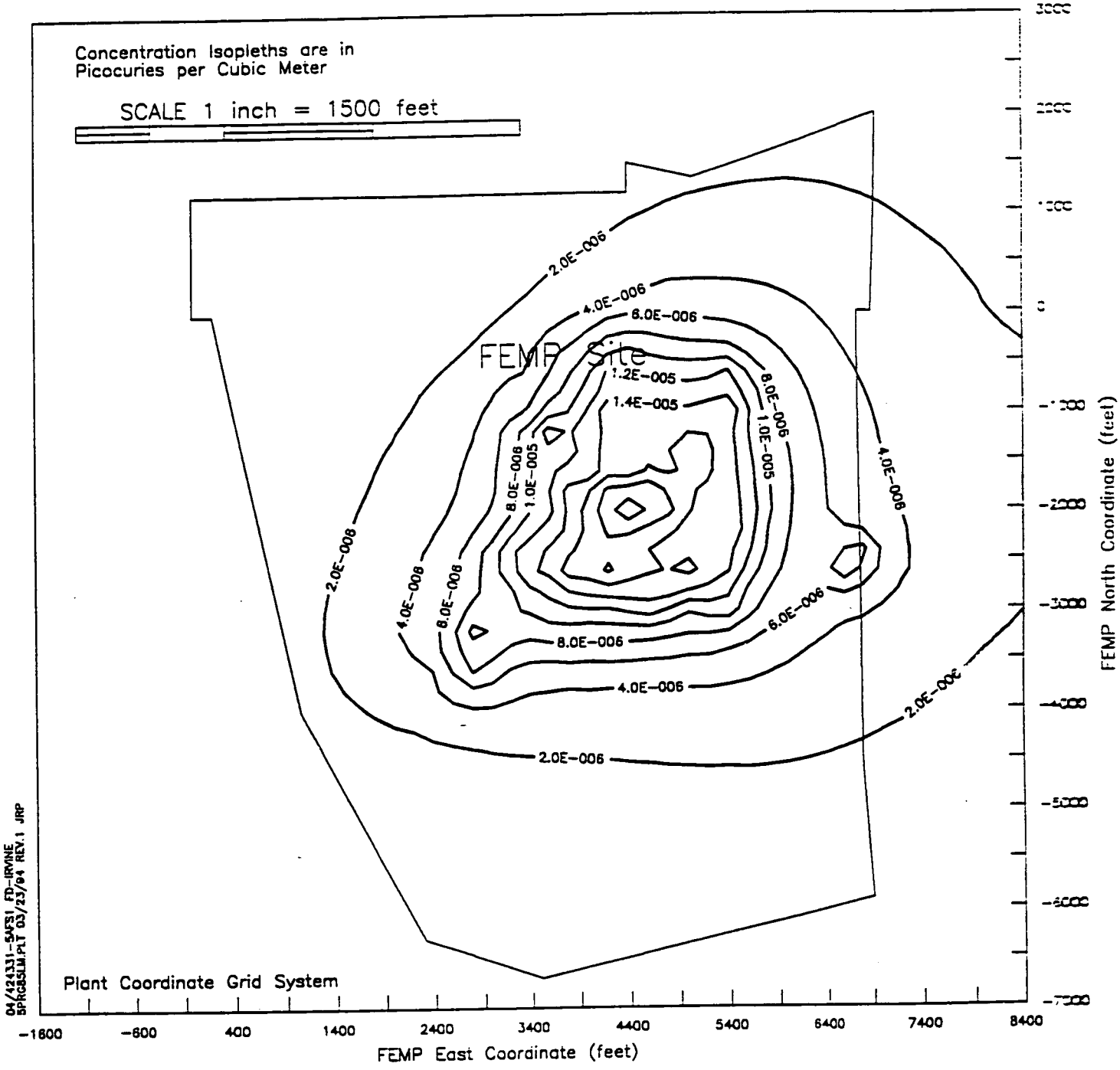

PM10 Air Conc: Limited Erosion, 85% Veg. Cover, ≥50 pCi/g U238

FIGURE 2

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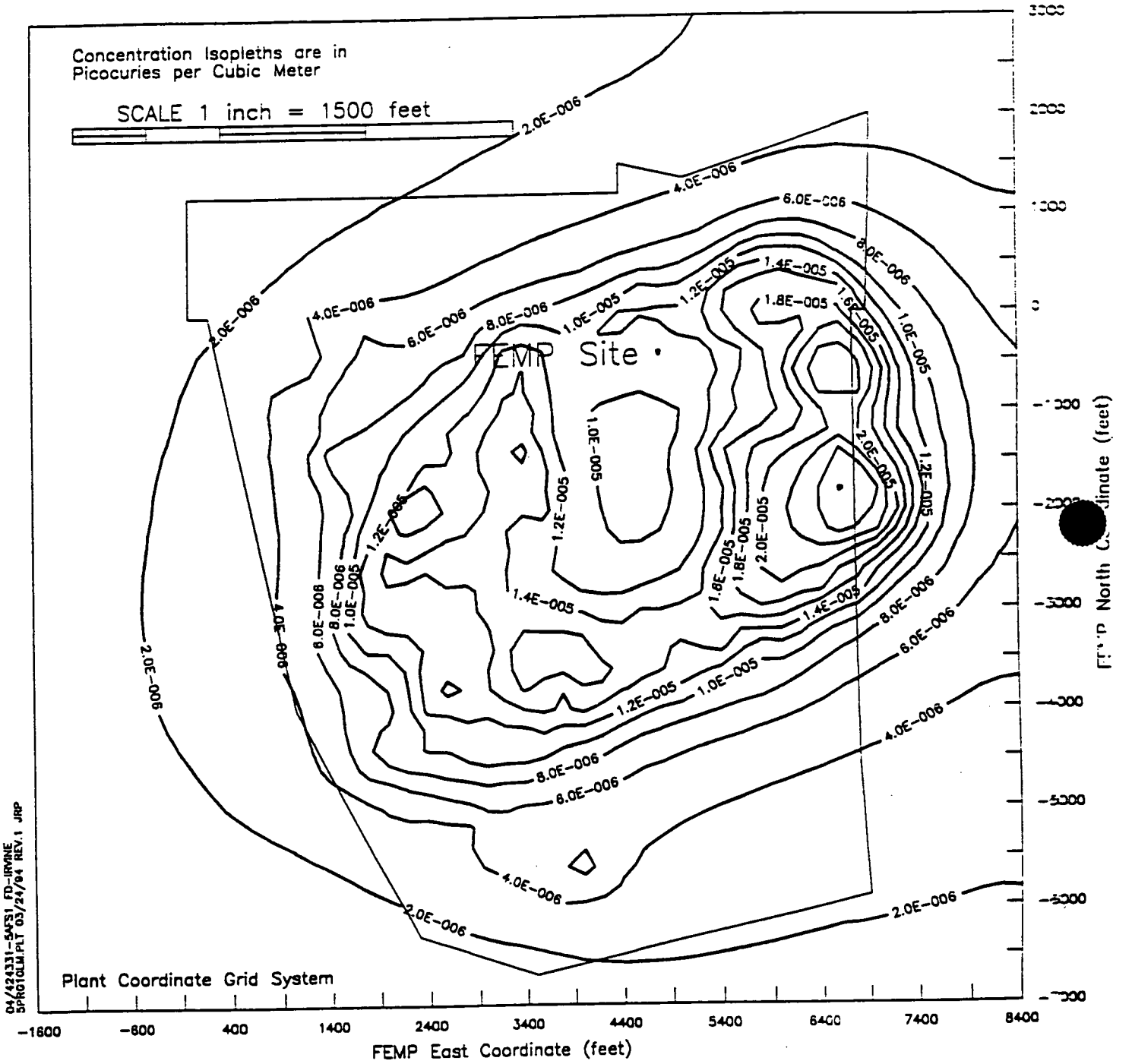

PM10 Air Conc: Limited Erosion, 85% Veg. Cover, Areas ≥10 pCi/g U238

FIGURE 3

Attachment F.1.IV

Selection of Predominant Carcinogenic and Noncarcinogenic Constituents of Concern COCs Based on Relative Contributions to Total Risk Level and Hazard Index Over OU1, OU2, and OU4 Air Pathway

TABLE F.1-IV-1
SELECTION OF PREDOMINANT CARCINOGENIC AND NONCARCINOGENIC CONSTITUENTS OF CONCERN (COCs)
FOR FATE AND TRANSPORT MODELING [1]
BASED ON RELATIVE CONTRIBUTIONS TO TOTAL RISK LEVEL AND HAZARD INDEX OVER OU1, OU2 AND OU4 - COMBINED
AIR PATHWAYS - FUTURE LAND USE
RME ON-PROPERTY FARMER

	ICLRs for OU1, OU2 and OU4					HQs for OU1, OU2 and OU4				
	Sum of ICLRs Across Pathways [3]			Sum of ICLRs Across Operable Units	% Contribution to Total ICLR for All Operable Units	Sum of HQs Across Pathways [3]			Sum of HQs Across Operable Units	% Contribution to HI for All Operable Units
Constituent of Concern [2]	OU1	OU2	OU4			OU1	OU2	OU4		
Radionuclides										
Actinium-227+7D	NA	NA	1.1E-03	1.1E-03	1.89	NA	NA	NA	NA	NA
Cesium-137+1D	8.6E-07	NA	NA	8.6E-07	0.002	NA	NA	NA	NA	NA
Lead-210+2D	NA	NA	1.4E-03	1.4E-03	2.40	NA	NA	NA	NA	NA
Neptunium-237+1D	8.9E-06	3.1E-07	NA	9.2E-06	0.016	NA	NA	NA	NA	NA
Plutonium-238	6.8E-07	2.0E-07	NA	8.8E-07	0.002	NA	NA	NA	NA	NA
Plutonium-239/240	2.9E-06	NA	NA	2.9E-06	0.005	NA	NA	NA	NA	NA
Protactinium-231	NA	NA	6.5E-04	6.5E-04	1.15	NA	NA	NA	NA	NA
Radium-226+5D	NA	4.3E-06	3.4E-04	3.5E-04	0.614	NA	NA	NA	NA	NA
Radium-226+8D	4.7E-05	NA	NA	4.7E-05	0.083	NA	NA	NA	NA	NA
Radium-228+1D	NA	1.6E-07	1.6E-05	1.6E-05	0.029	NA	NA	NA	NA	NA
Radon-222+4D	NA	NA	4.8E-03	4.8E-03	8.50	NA	NA	NA	NA	NA
Strontium-90+1D	NA	NA	3.5E-07	3.5E-07	0.001	NA	NA	NA	NA	NA
Technetium-99	8.8E-07	NA	2.6E-07	1.1E-06	0.002	NA	NA	NA	NA	NA
Thorium-228+7D	NA	1.4E-05	1.3E-03	1.3E-03	2.36	NA	NA	NA	NA	NA
Thorium-230	1.6E-03	1.7E-05	3.3E-02	3.5E-02	61.6	NA	NA	NA	NA	NA
Thorium-232	NA	4.6E-06	4.5E-04	4.6E-04	0.810	NA	NA	NA	NA	NA
Thorium-232+10D	2.0E-04	NA	NA	2.0E-04	0.361	NA	NA	NA	NA	NA
Uranium-234	3.3E-04	9.4E-06	9.7E-04	1.3E-03	2.33	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	6.8E-05	4.4E-07	5.6E-05	1.4E-04	0.255	NA	NA	NA	NA	NA
Uranium-238+2D	2.4E-03	2.0E-05	1.7E-03	4.2E-03	7.36	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	NA	9.1E-07	NA	9.1E-07	0.002	NA	NA	NA	NA	NA
Benzo(a)pyrene	3.0E-07	1.7E-05	NA	1.7E-05	0.031	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.5E-07	4.2E-06	NA	4.4E-06	0.008	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	4.0E-06	NA	4.0E-06	0.007	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	3.8E-06	NA	3.8E-06	0.007	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.3E-06	9.9E-05	NA	1.0E-04	0.178	NA	NA	NA	NA	NA
Pesticides/PCBs										
PCBs	6.3E-05	NA	NA	6.3E-05	0.112	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	2.6E-07	NA	2.6E-07	0.0005	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs										
Hexachlorodibenzo-p-dioxin	5.8E-07	NA	NA	5.8E-07	0.001	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	2.0E-06	NA	NA	2.0E-06	0.004	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	2.3E-06	NA	NA	2.3E-06	0.004	NA	NA	NA	NA	NA
Inorganics										
Arsenic	4.7E-03	3.7E-06	5.0E-04	5.2E-03	9.22	6.0E+00	NA	NA	6.0E+00	5.52
Barium	NA	NA	NA	NA	NA	5.6E-01	NA	NA	5.6E-01	0.514
Beryllium	5.6E-06	4.7E-07	2.7E-06	8.7E-06	0.015	NA	NA	NA	NA	NA
Cadmium	6.9E-07	NA	6.6E-06	7.3E-06	0.013	NA	NA	NA	NA	NA
Chromium, hexavalent	2.7E-05	5.3E-06	1.7E-04	2.1E-04	0.365	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	4.8E-01	NA	1.0E+02	1.0E+02	91.8
Manganese	NA	NA	NA	NA	NA	5.0E-01	NA	4.9E-01	9.9E-01	0.903
Nickel	1.1E-06	3.4E-07	3.8E-05	4.0E-05	0.070	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	2.9E-01	NA	NA	2.9E-01	0.269
Uranium, Total	NA	NA	NA	NA	NA	1.6E-01	NA	NA	1.6E-01	0.147

Total ICLR for each OU [4]:

OU1	OU2	OU4
9.6E-03	2.1E-04	4.7E-02

Total ICLR over all OUs [5]: 5.6E-02

Total HI for each OU [4]:

OU1	OU2	OU4
6.4E+00	NA	1.0E+02

Total HI over all OUs [5]: 1.1E+02

Notes:
[1] Predominant COCs selected for fate and transport modeling are indicated with an asterisk (*).
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway in at least one operable unit.
[3] Air exposure pathways evaluated include inhalation, and ingestion of dust-affected homegrown produce, meat, and milk products.
[4] Total risk levels/hazard indices presented for each OU were obtained from respective baseline human health risk assessments and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
[5] Represents the sum of all risk levels/hazard indices over all COCs, exposure pathways and operable units.
NA - Not applicable.

Table Below Assumes OU4 Silo Structural Failure
TABLE F.1-IV-2
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
AIR PATHWAYS - FUTURE LAND USE
RME ON-PROPERTY FARMER
OU1 FEMP

	OU1 ICLRs						OU1 HQs					
Constituent of Concern [2]	Inhalation	Ingestion of Homegrown Produce	Ingestion of Homegrown Meats	Ingestion of Milk Products	Sum of ICLRs Across Pathways	% Contribution to Total Risk	Inhalation	Ingestion of Homegrown Produce	Ingestion of Homegrown Meats	Ingestion of Milk Products	Sum of HQs Across Pathways	% Contribution to HI
Radionuclides												
Actinium-227+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137+1D	6.8E-09	1.6E-07	2.9E-07	4.0E-07	8.6E-07	0.0089	NA	NA	NA	NA	NA	NA
Lead-210+2D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	8.1E-06	8.3E-07	4.7E-09	1.7E-09	8.9E-06	0.093	NA	NA	NA	NA	NA	NA
Plutonium-238	8.3E-07	4.5E-08	1.6E-12	1.3E-12	6.6E-07	0.0070	NA	NA	NA	NA	NA	NA
Plutonium-239/240	2.7E-06	2.1E-07	1.6E-11	1.3E-11	2.9E-06	0.030	NA	NA	NA	NA	NA	NA
Protactinium-231	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	1.5E-05	2.4E-05	9.9E-07	7.1E-06	4.7E-05	0.492	NA	NA	NA	NA	NA	NA
Radium-228+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radon-222+4D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	6.6E-08	1.8E-07	1.1E-07	5.0E-07	8.6E-07	0.0091	NA	NA	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	1.6E-03	9.5E-06	1.1E-08	3.6E-08	1.6E-03	16.8	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	2.0E-04	4.0E-06	4.8E-09	1.6E-08	2.0E-04	2.13	NA	NA	NA	NA	NA	NA
Uranium-234	3.3E-04	2.6E-06	2.9E-08	3.5E-07	3.3E-04	3.48	NA	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	8.7E-05	7.1E-07	7.9E-09	9.4E-08	8.8E-05	0.917	NA	NA	NA	NA	NA	NA
Uranium-238+2D	2.4E-03	1.6E-05	1.8E-07	2.2E-06	2.4E-03	25.2	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds												
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	4.7E-09	7.4E-08	9.8E-08	1.2E-07	3.0E-07	0.0031	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2E-09	1.8E-08	9.1E-08	1.2E-07	2.3E-07	0.0024	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	ND	8.8E-09	5.6E-07	7.1E-07	1.3E-06	0.013	NA	NA	NA	NA	NA	NA
Pesticides/PCBs												
PCBs	ND	8.4E-06	2.4E-05	3.1E-05	6.3E-05	0.662	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs												
Hexachlorodibenzo-p-dioxin	1.9E-09	2.3E-08	2.3E-07	3.3E-07	5.8E-07	0.0061	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	6.7E-09	7.9E-08	8.0E-07	1.1E-06	2.0E-06	0.021	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	7.7E-09	9.1E-08	9.2E-07	1.3E-06	2.3E-06	0.024	NA	NA	NA	NA	NA	NA
Inorganics												
Arsenic	1.5E-03	2.5E-03	6.3E-04	7.5E-05	4.7E-03	49.1	ND	4.7E+00	1.2E+00	1.4E-01	6.0E+00	71.6
Barium	NA	NA	NA	NA	NA	NA	5.0E-01	3.5E-02	2.6E-03	2.5E-02	5.6E-01	6.67
Beryllium	5.4E-07	4.2E-06	6.1E-07	2.9E-09	5.6E-06	0.058	NA	NA	NA	NA	NA	NA
Cadmium	6.9E-07	ND	ND	ND	6.9E-07	0.0072	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	2.7E-05	ND	ND	ND	2.7E-05	0.282	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	4.6E-01	4.4E-05	1.2E-04	4.6E-05	4.6E-01	5.70
Manganese	NA	NA	NA	NA	NA	NA	4.6E-01	1.1E-02	9.6E-04	3.3E-03	5.0E-01	5.87
Nickel	1.1E-06	ND	ND	ND	1.1E-06	0.011	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	ND	3.1E-02	2.2E-01	4.3E-02	2.8E-01	3.49
Uranium, Total	NA	NA	NA	NA	NA	NA	ND	1.4E-01	1.6E-03	1.9E-02	1.6E-01	1.91

Total ICLR for Pathway [3]:	6.2E-03	2.6E-03	6.6E-04	1.2E-04	Total HI for Pathway [3]:	1.5E+00	5.1E+00	1.5E+00	3.3E-01
Total ICLR for OU1:				9.6E-03	Total HI for OU1:				8.4E+00

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.
ND - No data for toxicity assessment for exposure pathway.

TABLE F.1-IV-3
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
AIR PATHWAYS – FUTURE LAND USE
RME ON-PROPERTY FARMER
OU2 FEMP

Constituent of Concern [2]	OU2 ICLRs						OU2 HQs					
	Inhalation	Ingestion of Homegrown Produce	Ingestion of Homegrown Meats	Ingestion of Milk Products	Sum of ICLRs Across Pathways	% Contribution to Total Risk	Inhalation	Ingestion of Homegrown Produce	Ingestion of Homegrown Meats	Ingestion of Milk Products	Sum of HQs Across Pathways	% Contribution to HI
Radionuclides												
Actinium-227+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-210+2D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	3.0E-07	5.8E-09	2.6E-11	9.6E-12	3.1E-07	0.146	NA	NA	NA	NA	NA	NA
Plutonium-238	2.0E-07	3.0E-09	1.2E-13	1.0E-13	2.0E-07	0.097	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protactinium-231	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	3.6E-06	4.2E-07	7.4E-09	5.3E-08	4.3E-06	2.04	NA	NA	NA	NA	NA	NA
Radium-228+8D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-228+1D	1.1E-07	4.4E-08	8.9E-10	6.4E-09	1.6E-07	0.077	NA	NA	NA	NA	NA	NA
Radon-222+4D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-228+7D	1.4E-05	2.7E-08	1.3E-11	4.2E-11	1.4E-05	6.69	NA	NA	NA	NA	NA	NA
Thorium-230	1.7E-05	2.0E-08	1.0E-11	3.4E-11	1.7E-05	8.12	NA	NA	NA	NA	NA	NA
Thorium-232	4.6E-06	5.4E-09	2.7E-12	9.1E-12	4.6E-06	2.20	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	9.4E-06	1.6E-08	2.6E-10	3.2E-09	9.4E-06	4.49	NA	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	4.4E-07	7.6E-10	1.3E-11	1.5E-10	4.4E-07	0.210	NA	NA	NA	NA	NA	NA
Uranium-238+2D	2.0E-05	3.0E-08	5.0E-10	5.8E-09	2.0E-05	9.56	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds												
Benzo(a)anthracene	1.1E-07	3.7E-07	1.8E-07	2.4E-07	9.1E-07	0.434	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.3E-06	4.2E-06	5.2E-06	6.5E-06	1.7E-05	8.21	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.1E-07	3.4E-07	1.6E-06	2.1E-06	4.2E-06	1.98	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	5.4E-08	1.7E-07	1.7E-06	2.1E-06	4.0E-06	1.92	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	3.0E-07	9.6E-07	1.1E-06	1.4E-06	3.6E-06	1.79	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.4E-07	7.4E-07	4.3E-05	5.5E-05	9.8E-05	47.2	NA	NA	NA	NA	NA	NA
Pesticides/PCBs												
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	4.0E-08	9.6E-08	1.2E-07	2.6E-07	0.123	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs												
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics												
Arsenic	2.7E-06	6.2E-07	1.4E-07	1.6E-08	3.7E-06	1.75	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1.8E-07	2.6E-07	2.1E-08	7.7E-11	4.7E-07	0.225	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	5.3E-06	NA	NA	NA	5.3E-06	2.53	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	3.4E-07	NA	NA	NA	3.4E-07	0.162	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total ICLR for Pathway [3]:	6.1E-05	8.6E-06	5.3E-05	6.7E-05	Total HI for Pathway [3]:		NA	NA	NA	NA		
Total ICLR for OU2:				2.1E-04	Total HI for OU1:					NA		

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard index(ices) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA – Not applicable. Constituent not a CPC for media or exposure pathway not applicable.
ND – No data for toxicity assessment for exposure pathway.

TABLE F.1-IV-4
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
AIR PATHWAYS – FUTURE LAND USE
RME ON-PROPERTY FARMER
OU4 FEMP [2]

	OU4 ICLRs						OU4 HQs					
Constituent of Concern [3]	Inhalation	Ingestion of Homegrown Produce	Ingestion of Homegrown Meats	Ingestion of Milk Products	Sum of ICLRs Across Pathways	% Contribution to Total Risk	Inhalation	Ingestion of Homegrown Produce	Ingestion of Homegrown Meats	Ingestion of Milk Products	Sum of HQs Across Pathways	% Contribution to HI
Radionuclides												
Actinium-227+7D	1.0E-03	6.6E-05	1.0E-07	3.4E-07	1.1E-03	2.29	NA	NA	NA	NA	NA	NA
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-210+2D	3.5E-04	9.2E-04	2.0E-05	6.7E-05	1.4E-03	2.91	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-238	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protactinium-231	6.3E-04	2.1E-05	1.5E-08	3.0E-08	6.5E-04	1.40	NA	NA	NA	NA	NA	NA
Radium-226+5D	2.2E-04	1.2E-04	2.6E-06	1.9E-09	3.4E-04	0.734	NA	NA	NA	NA	NA	NA
Radium-226+8D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-228+1D	5.3E-06	9.9E-06	1.4E-07	9.9E-07	1.6E-05	0.035	NA	NA	NA	NA	NA	NA
Radon-222+4D	4.6E-03	NA	NA	NA	4.8E-03	10.3	NA	NA	NA	NA	NA	NA
Strontium-90+1D	2.3E-09	1.3E-07	1.0E-08	2.1E-07	3.5E-07	0.0008	NA	NA	NA	NA	NA	NA
Technetium-99	1.5E-10	2.6E-08	4.2E-08	1.9E-07	2.6E-07	0.0006	NA	NA	NA	NA	NA	NA
Thorium-228+7D	1.3E-03	1.7E-05	5.3E-09	1.6E-08	1.3E-03	2.82	NA	NA	NA	NA	NA	NA
Thorium-230	3.3E-02	1.7E-04	7.5E-08	2.5E-07	3.3E-02	71.1	NA	NA	NA	NA	NA	NA
Thorium-232	4.5E-04	2.9E-06	1.2E-09	4.0E-09	4.5E-04	0.971	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	9.6E-04	8.7E-06	1.2E-07	1.5E-06	9.7E-04	2.08	NA	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	5.5E-05	5.3E-07	7.6E-09	9.1E-08	5.6E-05	0.119	NA	NA	NA	NA	NA	NA
Uranium-238+2D	1.7E-03	1.5E-05	2.0E-07	2.4E-06	1.7E-03	3.68	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds												
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs												
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs												
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics												
Arsenic	5.0E-04	1.1E-09	9.6E-11	1.2E-11	5.0E-04	1.07	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	2.7E-06	2.0E-11	6.7E-13	2.4E-15	2.7E-06	0.0057	NA	NA	NA	NA	NA	NA
Cadmium	6.6E-06	NA	NA	NA	6.6E-06	0.014	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	1.7E-04	NA	NA	NA	1.7E-04	0.373	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	1.0E+02	9.3E-09	6.1E-09	2.4E-09	1.0E+02	99.0
Manganese	NA	NA	NA	NA	NA	NA	4.6E-01	2.5E-08	4.6E-10	1.7E-09	4.6E-01	0.488
Nickel	3.8E-05	NA	NA	NA	3.8E-05	0.082	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Total ICLR for Pathway [4]:	4.5E-02	1.4E-03	2.3E-05	9.2E-05	Total HI for Pathway [4]:	1.0E+02	2.7E-08	5.0E-07	1.2E-07
Total ICLR for OU4:				4.7E-02	Total HI for OU4:				1.0E+02

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Risk levels and hazard quotients presented were derived in the baseline human health risk assessment assuming silo structural failure.
[3] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[4] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA – Not applicable. Constituent not a CPC for media or exposure pathway not applicable.
ND – No data for toxicity assessment for exposure pathway.

F.2.0 SURFACE WATER TRANSPORT MODEL

F.2.1 INTRODUCTION

This section describes the surface water modeling conducted for Operable Unit 5 at the Fernald Environmental Management Project (FEMP) including the objectives, procedures, and results of the surface water modeling.

F.2.1.1 Objectives

The purpose of surface water modeling at the FEMP is to quantify the effect of rainwater coming into contact with contaminated soil and the subsequent transport of the contaminants with the runoff. The main objectives of modeling the surface water pathway are to predict the concentration of contaminants in surface water and sediment and to estimate the amount of contaminant reaching the groundwater from infiltration through the streambeds of water courses draining the FEMP. These estimates of contaminants reaching the groundwater via surface water are then used as contaminant loading rates in the groundwater solute transport model.

Section 5.0 of this report presents an overall summary of the fate and transport modeling used for all of the contaminant migration pathways including the surface water pathway. Section 5.0 describes the general modeling approach, models, definition of modeled conditions, screening procedures, and key results from the fate and transport modeling of the surface water pathway. This appendix provides additional details of the modeling performed for the surface water pathway. Specifically, this appendix contains the following information:

- Detailed description of the surface hydrological conditions at the FEMP
- The technical approach, the modeling framework, and descriptions of the specific surface water models used
- Examples of all of the equations used for contaminant transport calculations
- Discussion and presentation of contaminant source areas and concentrations used for the surface water fate and transport modeling
- Presentation of the geochemical parameters used in the surface water fate and transport modeling

- Discussion of the constituent of potential concern (CPC) screening and the equations used to perform this task
- The modeling results
- An evaluation of the model performance
- A summary of the sensitivity analysis results.

F.2.1.2 General Surface Hydrological Conditions

The FEMP is located within the Great Miami River drainage basin above the river's present day flood plain. The natural surface water drainage system in the FEMP area is dominated by the Great Miami River located approximately 0.6 miles to the east and 1.5 miles to the south of the FEMP (Figure F.2.1-1). The river flows generally to the southwest and has a drainage area of approximately 3360 square miles at the Hamilton gauge, which is located approximately 10 miles upstream from the FEMP. The Great Miami River flows into the Ohio River about 24 miles downstream of the FEMP. Only a small portion in the northeast corner of the FEMP property drains directly to the Great Miami River. Paddys Run originates north of the FEMP and discharges into the Great Miami River approximately 1.5 miles south of the FEMP. Several small drainage courses on the FEMP discharge to Paddys Run; the largest of these is the storm sewer outfall ditch (SSOD). The remainder of the surface water runoff from the FEMP eventually drains to Paddys Run, an intermittent stream which flows along the western edge of the FEMP. Approximately 32 acres of the 1050-acre FEMP property drains directly to the Great Miami River.

Paddys Run drains a 15-square mile catchment which includes most of the FEMP. The drainage basin extends approximately 8 miles north of its confluence with the Great Miami River and approaches 3 miles in width at its widest point. The Paddys Run drainage basin, with the exception of the FEMP, is primarily rural, characterized by farm fields and woods with occasional residential areas scattered throughout. The land surface in the vicinity of the FEMP is relatively flat. At the perimeter of the drainage basin, the land is characterized by steep slopes leading to the hilltop drainage divides.

Paddys Run flows only a portion of the year, typically during the late winter and spring months when precipitation events are commonly produced from regional storm events. During the summer and fall months Paddys Run is generally dry, except during storm events when flow occurs over a few hours to several days depending on the severity of the storm (DOE 1993b). The presence of continuous

flow in Paddys Run during the late winter and spring months between rainfall events can be attributed to several factors. During the late winter and spring months a greater amount of rain falls on the drainage basin than during the other months of the year. Because of the additional rainfall, the soil in the drainage basin remains moister, causing a greater percentage of rainfall to become runoff (less rainfall will directly infiltration to the ground surface). After the rainfall event ends the collecting watercourse or stream generally will flow for some time afterwards as the runoff makes its way down the drainage paths. The more frequent occurrence of rainfall events during this part of the year could result in a continuous flow in Paddys Run as the runoff from a previous storm event is overlapped by the next. The additional rainfall that occurs during this part of the year would also cause the moisture content of the unsaturated glacial outwash deposits beneath the streambeds of Paddys Run to remain higher which would reduce the infiltration rate into the streambeds and allow more water to remain flowing in the streams. The continuous flow in Paddys Run is also contributed to by groundwater seeps from the glacial overburden from both the FEMP property and from the approximately 10-square miles of drainage area upstream of the FEMP.

Currently, the storm water runoff from portions of the FEMP property, the former production and waste pit areas, is collected and pumped to the Great Miami River by way of Manhole 175 and the main effluent line (Figure F.2.1-1). The former production area (where uranium was processed) is located in the center of the FEMP property. The waste pit area (where wastes from uranium processing were stored) is located between the former production area and Paddys Run. Surface water flow from the production area discharged to the SSOD until 1986 when the first storm water retention basin was put into operation. The storm water retention basin allows for the settling of solids discharging to Manhole 175. The storm water collection system around the waste pit area was completed in July 1992; before this the runoff discharged into Paddys Run.

In the vicinity of the FEMP, portions of Paddys Run and the SSOD have cut into glacial outwash deposits which form the water-bearing unit of the Great Miami Aquifer. The streambed elevations of Paddys Run and the SSOD are generally above the groundwater elevation of the Great Miami Aquifer in the vicinity of the FEMP. This condition creates a situation in which some of the water flowing in the streams is lost into the surrounding ground (losing stream). During the remedial investigation/ feasibility studies (RI/FS) conducted at the FEMP, it was discovered that Paddys Run and the SSOD are directly connected with the underlying Great Miami Aquifer and that a potential pathway exists for contaminant transport into the aquifer through the streambed of Paddys Run and the SSOD.

F.2.2 TECHNICAL APPROACH

This section describes the technical approach used to simulate the movement of contaminants in the surface water for Operable Unit 5, the conceptual model of surface water runoff, and the model framework, approach, and procedures used to simulate the various runoff processes.

F.2.2.1 Conceptual Model

The discussion of the conceptual model of the surface water pathway is divided into four sections to describe the various processes involved. The four sections are rainfall and runoff, infiltration, contaminant transport, and a summary of the major assumptions of the surface water model.

F.2.2.1.1 Rainfall and Runoff

The Paddys Run drainage basin consists of land surfaces drained by streams and channels discharging to Paddys Run. As rain falls on the land, a portion of it becomes runoff while the rest of the rainfall either infiltrates directly into the ground or is lost due to evapotranspiration (Figure F.2.2-1). The amount of rainfall which becomes runoff is dependent on the ground surface conditions. The runoff then collects and flows in the channels in the drainage basin, moving from small channels to successively larger channels until reaching the basin outlet. The flow in the channels can come from the runoff or can enter the stream from groundwater. The flow that originates from the groundwater is baseflow. Paddys Run in the vicinity of the FEMP is often dry and does not contain any baseflow. A drainage basin can be divided into smaller areas called subbasins so that the runoff from any particular area can be analyzed separately. The variation of runoff with time is the runoff hydrograph. The runoff hydrograph from each of the subbasins can then be added together to yield the total hydrograph for the drainage basin.

F.2.2.1.2 Infiltration Through the Streambeds

The top layer of soil in the vicinity of the FEMP property consists of relatively impermeable glacial overburden deposits (Figure F.2.2-1). Underlying this layer are permeable glacial outwash deposits that form the water-bearing unit of the Great Miami Aquifer. Water readily infiltrates into the unsaturated outwash deposits due to its porous nature. The stream channels of Paddys Run and the SSOD have cut through the glacial overburden into the outwash deposits (Figure F.2.2-1). The water table elevation in the Great Miami Aquifer in and around the FEMP property is generally lower than the streambed elevation which forms an unsaturated (vadose) zone between the water table and the streambed. Significant amounts of water can infiltrate from the stream to the unsaturated glacial

outwash deposits and then enter the Great Miami Aquifer. This migration is the basis for modeling the surface water as a possible pathway of contamination to the groundwater.

The infiltration model simulates flow from the stream channels into the unsaturated and saturated zones of the glacial outwash deposits. For the reaches of Paddys Run and the SSOD that flow on top of the glacial overburden, infiltration is assumed negligible due to the low streambed permeability. Infiltration through the streambed will still occur where the stream is flowing on the less permeable glacial overburden; however, the greater majority of the infiltration will occur where the stream has cut into the glacial outwash deposits. The small amount that infiltrates into the glacial overburden can be neglected without affecting the overall results of the model. Therefore, within these reaches infiltration rates were not calculated. When Paddys Run cuts deep enough into the glacial outwash deposits so that the streambed elevation matches the water table elevation, infiltration again becomes negligible because the water elevations are in equilibrium. The water table elevation in the Great Miami Aquifer fluctuates during the year, so that the lateral extent of infiltration in the streambeds also fluctuates. Figure F.2.2-2 indicates the areas of surface water infiltration to the Great Miami Aquifer along Paddys Run and the SSOD. Infiltration was calculated from the location where the streams cut into the glacial outwash deposits until the location where streambed elevation matches the average water table elevation.

In order to simulate the infiltration of surface water into the streambeds of Paddys Run and the SSOD, the average groundwater elevation was used to set the bounds of the infiltration model. The average groundwater elevation under Paddys Run and the SSOD was determined by averaging water elevations in Type 2 monitoring wells located along Paddys Run and the SSOD that have more than 20 data points available. Between well locations the water elevations were linearly interpolated to create an average water table elevation profile under the streambeds.

Runoff and infiltration volumes were calculated at several cross-section locations along Paddys Run and the SSOD. Figure F.2.2-3 shows the limit of the glacial overburden and the cross sections used in the infiltration calculations. Paddys Run's streambed consists of glacial overburden north of cross section C-C and glacial outwash south of cross section C-C. Because cross section C-C is very close to the limit of the glacial overburden in Paddys Run, the infiltration calculations were begun there. All of the cross sections in the SSOD are in the permeable glacial outwash deposits. Cross section I-I is very close to the limit of glacial overburden in the SSOD so infiltration calculations were begun

there. The average water table and streambed elevations intersect near cross section F-F (approximately 2600 feet south of cross section E-E). At that point the infiltration again becomes negligible, so the infiltration calculations are stopped and the infiltration is assumed to be zero.

The infiltration of surface water through the streambeds of Paddys Run and the SSOD is calculated based on the head of water (depth) in the streams. The depth of flow in turn was based on the flow rates predicted with the runoff model.

The simulations assume there is no baseflow in Paddys Run. This means that Paddys Run and the SSOD have no flow at the beginning of the simulated storm event. It was also assumed that the glacial outwash deposits are unsaturated down to the groundwater table before the storm event. The effect of water infiltrating through the streambeds is assumed to not significantly affect the runoff hydrographs. The heads (flow depths in Paddys Run) input into the infiltration model based on the runoff hydrographs are not adjusted for the amount of water in the streams lost to infiltration.

F.2.2.1.3 Contaminant Transport

The contaminants being transported with the surface water runoff are assumed to be washed off the surface soil in and around the FEMP. Contaminated groundwater can potentially enter the surface water from two sources, either the perched water zone or from the Great Miami Aquifer. The perched water is located in sand and gravel lenses situated above the relatively impermeable glacial overburden deposits. The perched water can enter the surface water via seeps located along Paddys Run and some of its tributaries. The contaminant loading of perched water seeping into the surface water is evaluated and discussed in Section F.2.3.7. This evaluation included all of the chemicals either in the perched water or having the potential to enter the perched water above screening levels. As discussed in Section F.2.3.7, the results of this evaluation indicate that the contaminant contribution via this pathway is insignificant and can be neglected in the surface water modeling. Because both Paddys Run and SSOD are losing streams (to the Great Miami Aquifer) in the vicinity of the FEMP, the effect of contaminated groundwater from the Great Miami Aquifer entering the surface water bodies is considered insignificant. Contaminants can move with the runoff in two phases; adsorbed to sediment eroded from the land surface or dissolved in the runoff itself. The area surrounding the FEMP is divided into several contamination zones. Within each contamination zone the concentration of contaminant is assumed to be areally uniform. Discussion of determination of

contamination zones and contaminant concentrations will be presented in more detail in Section F.2.3.1.

The total annual contaminant loading to the Great Miami Aquifer is a combination of the loading patterns simulated with the representative storm event (i.e., a 1-year 24-hour storm event) and the total annual runoff. Contaminated runoff for rainfall events other than the representative storm event is conservatively assumed to completely enter the Great Miami Aquifer. However, only the portion of contaminated runoff caused by the representative storm event, that was simulated to enter the Great Miami Aquifer, is included in the total annual loading. The representative storm event only accounts for approximately 6 percent of the annual runoff so that the amount of contaminant which infiltrates from the representative storm only accounts for a small portion of the annual loading. Because of this, the actual volume of infiltration from Paddys Run and the SSOD caused by the representative storm event is not as important as the simulated pattern, or distribution, of the infiltration when estimating the total annual loading. The distribution of infiltration is needed to accurately predict the local contaminant loading rates and groundwater concentrations along the discharge points so that one area's concentration was not underestimated and another area overestimated.

F.2.2.1.4 Major Assumptions of the Surface Water Model

The following assumptions are made in modeling the surface water at the FEMP. The following list does not encompass all of the assumptions that are made in this modeling task but does list the major assumptions and gives an explanation of each or directs the reader to the appropriate section for a more complete explanation.

- Infiltration through the streambeds is assumed to be significant from the point where the streams cut through the glacial overburden to the point where the average water table matches the minimum streambed elevation. These assumptions are explained in greater detail in Section F.2.2.1.2.

- One-hundred percent of the of the contaminated runoff, other than the representative storm event, is assumed to enter the Great Miami Aquifer. This assumption is discussed in Sections F.2.2.1.3 and F.2.2.4.4.

The following assumptions are made concerning contaminant transport:

- Contaminants adsorbed to soil in runoff remain adsorbed in the stream sediment.
- Contaminants dissolved in runoff water remain dissolved in the receiving stream.
- Contaminants in the runoff are uniformly and completely mixed with the water in the receiving stream or groundwater.
- Contaminant concentrations within contaminant source areas are assumed to be a really uniform.

The assumptions made concerning contaminant transport in the surface water are reasonable and are consistent with assumptions made in the other operable unit RI's at the FEMP as well as the procedures presented in the Superfund Exposure Assessment Manual (EPA 1988). The assumption that the contaminants do not change phase between adsorption to the sediment and being dissolved in the water is reasonable since the flow of the water is relatively ephemeral in and around the FEMP so that the contaminants would not have the time required to reach an equilibrium and change phases appreciably. The changing of phases would not have a significant effect on the concentrations in the surface water and the sediment.

F.2.2.2 Model Framework and Approach

The following sections describe the various computer models and reports used to construct the overall model of the surface water flow and contaminant transport at the FEMP. Table F.2.2-1 presents a summary of the major models used in simulating the surface water runoff and the associated contaminant transport at the FEMP.

The modeling of the surface water for Operable Unit 5 at the FEMP was completed in two stages and is presented in two reports. The movement of surface water, rainfall, runoff, and infiltration was performed first with the results presented in the Surface Water Flow and Infiltration Model Summary Report (SWF&IM) (DOE 1994b). The results of the SWF&IM were then incorporated into this RI report to calculate the contaminant transport in the surface water pathway.

Figure F.2.2-4 shows a flow chart of this process for completing the modeling of the surface water pathway at the FEMP for Operable Unit 5. The modeling approach and procedures are described in the two following sections. The modeling framework used in the SWF&IM is described in

Section F.2.2.3 and the contaminant transport calculations performed for this report are described in Section F.2.2.4.

F.2.2.3 Surface Water Flow and Infiltration Model Summary Report

The primary purpose of the Surface Water Flow and Infiltration Model Summary Report (DOE 1994b) was to provide information concerning the hydrology and hydraulics of the Paddys Run drainage basin needed to conduct modeling of the contaminant transport in the surface water at the FEMP. The SWF&IM report provided the infiltration pattern and runoff flow volumes for use in the contaminant transport calculations. The technical approach used for the contaminant fate and transport modeling was also described in the SWF&IM report. A representative storm event was chosen for use in estimating the infiltration pattern of surface water into the Great Miami Aquifer. The representative storm event chosen was the 1-yr, 24-hour storm event. Its selection is discussed in greater detail in the SWF&IM report.

The SWF&IM consists of the following components. The rainfall and runoff were simulated with the HEC-1 modeling code (U.S. Army Corps of Engineers 1990). Rating curves for cross sections along Paddys Run and the SSOD were generated using Mannings equation (Henderson 1966). Mannings Equation was applied along Paddys Run and the SSOD to determine the elevation of water in the stream (stage) at each cross-section location for a given flow rate (discharge). This relationship between stage and discharge at a cross section of a stream is called a rating curve.

Areas around the FEMP were first divided into drainage subbasins to allow calculation of runoff from specific areas of the site. These subbasin delineations were developed based on the drainage patterns in and around the FEMP. Figure F.2.2-5 shows the entire Paddys Run drainage basin and the subbasins used for the HEC-1 model. The Paddys Run drainage basin was first divided into 15 subbasins to be used for infiltration calculations in the HEC-1 simulation. The drainage area for the area of the FEMP which drains directly to the Great Miami River was modeled as one separate subbasin. The Paddys Run subbasins in the vicinity of the FEMP were further subdivided to refine the HEC-1 model for use in the contaminant calculations. The HEC-1 model of Paddys Run used for contaminant calculations contains 19 subbasins. The subbasins that were further divided are shown in Figure F.2.2-6. Figure F.2.2-7 shows a schematic representation of the linking of the Paddys Run subbasins in the HEC-1 model. The HEC-1 model is described in much greater detail in the SWF&IM report.

In order to evaluate how well the HEC-1 model and Mannings equation simulate the stage in Paddys Run, the predicted rise in water elevations were compared to measured rises in water elevation (DOE 1994a). Storm events occurring on April 3-4 and 28-29, 1989 were simulated with the surface water model. Measured hourly precipitation data was input into the HEC-1 model to simulate these storm events. The parameters governing the initial soil moisture content in the HEC-1 model were input into the model to represent the wetter-than-average initial soil condition (caused by numerous large storm events occurring that spring) that existed in April of 1989. The on-site FEMP precipitation data was supplemented with data from the Greater Cincinnati Airport to replace several missing data points from the FEMP rain gauge. This data was used because it was the best information available for the missing data points in question.

A comparison of the modeled and measured rise in flow depth of Paddys run is presented in the Table F.2.2-2. The measured rise in water surface elevation was measured at two location along Paddys Run in April of 1989; Stilling Wells 9 (near cross-section location C-C) and 14 (near cross-section location E-E). The measured and modeled rises in stream elevation for the April 3-4 storm were within 3 percent of each other at both measuring locations on Paddys Run. The modeled rise in stream depth for the April 28-29 storm did not match as well although the differences between the modeled and the measured elevation rises were less than 10 inches. The second storm event may not have matched as well because the site rainfall data for this event had to be supplemented with rainfall data from the Greater Cincinnati Airport approximately 17 miles to the south. Based on the simulated actual storm events, it is determined that the surface water model is predicting the water surface elevations with acceptable accuracy.

To calculate infiltration from surface water to the Great Miami Aquifer, the computer code VS2DT (Healy 1990) was applied at each cross section. A time varying depth of water was then input into the VS2DT program for the infiltration calculations to simulate the fluctuation of flow depths in the streams during the representative storm event. The storm water depth was based on the runoff hydrographs from HEC-1 combined with the rating curves developed with Mannings equation. The output from VS2DT provided the infiltration volumes and patterns to the Great Miami Aquifer along the study length of Paddys Run and the SSOD. The runoff hydrographs and infiltration information were then used in calculating contaminant concentrations and loadings. Figure F.2.2-8 shows the relations of the various components of the surface water model. The portion of the over all surface

water modeling which was calculated in the SWF&IM is located in the upper left corner of Figure F.2.2-8.

The results of the SWF&IM report used in the contaminant transport calculations are described in Section F.2.2.4 in conjunction with the descriptions of the contaminant transport modeling approach.

F.2.2.4 Contaminant Transport Model

The transport of contaminants centers on the use of the modified universal soil loss equation (MUSLE) and partitioning equations, both of which are presented in the Superfund Exposure Assessment Manual (EPA 1988). The MUSLE equation is used to calculate the amount of sediment generated from the representative storm event in each subbasin. The partitioning equations are then used to determine the amount of contaminant transported with the runoff and the amount transported with the sediment. As flows from different subbasins combine, the contaminant concentration in the combined flow is calculated based on a mass balance approach.

F.2.2.4.1 Sediment Generation

The MUSLE equation is used to calculate the amount of sediment generated from each subbasin containing contaminated areas. The MUSLE equation takes the following form:

$$Y(S)_e = a\,(V_r q_p)^{0.56}\,K\,LS\,C\,P \qquad \text{(F.2-1)}$$

where

Y(S)E	=	sediment yield (mass per event)
a	=	conversion constant
V_r	=	volume of runoff (volume, from HEC-1 output)
q_p	=	peak flow rate (volume / time, from HEC-1 output)
K	=	soil erodibility factor (mass/area/unit erosion potential from County Soil Survey)
LS	=	slope length factor (dimensionless, from Superfund Exposure Assessment Manual)
C	=	cover factor (dimensionless, from Superfund Exposure Assessment Manual)
P	=	erosion control practice factor (dimensionless, from Superfund Exposure Assessment Manual)

The volume of runoff and the peak flow rate can be calculated based on equations presented in the Superfund Exposure Assessment Manual; however, because this information is available from the HEC-1 output the HEC-1 results are used. The HEC-1 analysis is more detailed than the equations in the Manual and should yield more consistent results because the same HEC-1 output was used in other parts of this overall analysis (i.e., infiltration calculations). Table F.2.2-3 provides the peak flow rates and runoff volumes estimated with the HEC-1 model. Table F.2.2-4 lists the MUSLE parameters used in the contaminant transport calculations for each subbasin in the model. The output from the MUSLE equation is the total amount of sediment produced (in mass) from each subbasin.

F.2.2.4.2 Partitioning Equations

Calculations to determine the amount of contaminant in the runoff and in sediment for each subbasin are performed for each CPC. The following equations calculate the amount of adsorbed and dissolved contaminants available in the top 0.4 inch (1 cm) of soil (EPA 1988).

$$S_s = \left[1/\left(1 + \theta_c/(K_d\beta)\right)\right] C_i\, A_c\, \beta \qquad \text{(F.2-2)}$$

$$D_s = \left[1/\left(1 + (K_d\, \beta/\theta_c)\right)\right] C_i\, A_c\, \beta \qquad \text{(F.2-3)}$$

where

S_s = adsorbed substance quantity (mass)
D_s = dissolved substance quantity (mass)
θ_c = available water capacity (dimensionless)
K_d = sorption partition coefficient (volume/mass)
β = soil bulk density (mass/volume)
C_i = total substance contamination (mass/area-in.)
A_c = contaminated area (area-in.)

The amount (mass) of contaminant and concentrations are given by the following equations:

$$PX_i = \left(Y(S)_e\ /\ aA\ \beta\right)\left(S_{s1} + S_{s2} + S_{s3}\right) \qquad \text{(F.2-4)}$$

$$PQ_i = \left(Q_r\ /\ R_t\right)\left(D_{s1} + D_{s2} + D_{s3}\right) \qquad \text{(F.2-5)}$$

$$C_e = PQ_i\ /\ V_r \qquad \text{(F.2-6)}$$

$$C_s = PX_i\ /\ Y(S)_e \qquad \text{(F.2-7)}$$

where

PX_i = adsorbed substance loss per event (mass)
PQ_i = dissolved substance loss per event (mass)
C_e = concentration of contaminant in runoff per subbasin (mass/volume)
C_s = concentration of contaminant in sediment per subbasin (mass/mass)
$Y(S)_e$ = sediment yield (mass, from MUSLE)
Q_r = total storm runoff (depth, from HEC-1 output)
R_t = total storm rainfall (depth, from HEC-1 input)
V_r = storm runoff volume (volume, HEC-1 output)
A = total subbasin area (area-in.)
S_{s1} = adsorbed substance quantity for contaminated area one in the subbasin (mass)
D_{s1} = dissolved substance quantity for contaminated area one in the subbasin(mass)
a = conversion constant

The procedures in the Superfund Exposure Assessment Manual are for an area that is uniformly and completely contaminated. The drainage subbasins from the HEC-1 model are relatively large and contain a significant areal variation in the contaminant concentrations in the surface soil. To account for this variation, the drainage subbasins are further subdivided, based on contaminant concentrations, into smaller areas assumed to have a uniform concentrations (Section F.2.3.2 discusses this further). The equations presented here have been modified slightly from the original equations in the Superfund Exposure Assessment Manual to handle the further division of the subbasins. The above equations have two parameters: 'A' is the entire subbasin while 'A_c' is a smaller area in the subbasin assumed to have a uniform concentration. The Superfund Exposure Assessment Manual only has a parameter for the total area. The sum of the contributions from each of the uniformly contaminated areas within the subbasin is used to calculate the total contaminant concentration from the entire subbasin.

The result from this step in the overall procedure is the contaminant concentration in the runoff and sediment from each subbasin. The runoff and sediment concentration calculations are continued to account for the mixing of contaminated runoff with runoff from uncontaminated subbasins outside of the FEMP property. The sediment concentrations in the SSOD and Paddys Run are calculated in the same manner as the runoff; because of this, only the runoff concentration equations are presented to avoid redundancy.

F.2.2.4.3 <u>Estimation of Concentrations in Runoff in Paddys Run, SSOD, and the Great Miami River</u>
The concentrations in Paddys Run, the SSOD, and the Great Miami River are calculated based on the 1-year, 24-hour storm event. The concentrations in Paddys Run and the SSOD resulting from the

contaminated flow from an individual contaminated subbasin are calculated with dilution factors. These dilution factors relate the concentration in the runoff coming from the contaminated subbasin to the resulting concentration in the receiving stream (either Paddys Run or the SSOD).

To be conservative, the procedure for estimating concentrations in the surface water assumes that no mass of contaminant is lost to infiltration through the streambeds. This assumption represents a worst-case scenario for concentrations in the surface water. If a storm event occurs when the streambeds are saturated, little or no dissolved contaminant would infiltrate through the streambeds. If the storm event occurred at any other time more contaminant would likely infiltrate, leaving less contaminant for the concentration in the surface water.

The combined effect of multiple contaminated subbasins entering Paddys Run and the SSOD also is evaluated. Where several contaminated subbasins enter Paddys Run at the same point, the average concentration of the contaminated subbasins is calculated based on a flow-volume weighing of the concentration from each subbasin. The average concentration is then used to calculate the resulting concentration in Paddys Run.

The total concentration in Paddys Run is calculated at cross sections C-C, D-D and E-E, as shown in Figure F.2.2-6. These locations include contamination entering Paddys Run at that point and contamination, if any, which entered Paddys Run upstream of that point.

The concentration in the Great Miami River resulting from contaminated flow from Paddys Run is calculated based on the average flow rate in the Great Miami River. Each of the above-mentioned calculations are discussed below.

Dilution Factors for Individual Contaminated Subbasins

To estimate the contaminant concentrations in Paddys Run and the SSOD, dilution factors were calculated for each contaminated subbasin. The dilution factors are applied to the runoff contaminant concentrations (i.e., C_e as described in Section F.2.2.4.2) from each contaminated subbasin. These dilution factors are based on the flows in the receiving stream (Paddys Run or the SSOD) when the peak flow from the contaminated subbasins enters the receiving stream. The dilution factor for each individual contaminated subbasin was calculated in the SWF&IM report and is presented in Table F.2.2-3.

000423

The flow from the contaminated subbasins is assumed to be uniformly contaminated with a constant concentration over the duration of the flow. The rates at which contaminants reach the receiving stream are greatest when the flow from the contaminated subbasin is the greatest, at the time of the peak discharge from the subbasin. Generally the maximum concentration in the receiving stream occurs when the most contaminant enters the stream. To be conservative, this maximum concentration is reported as the concentration in the receiving stream. The ratio of the peak flow in the contaminated subbasin to the flow in the receiving stream at the time of the peak discharge of the contaminated subbasins is used as the dilution factor. Figure F.2.2-9 graphically shows the relationship between the contaminated subbasin hydrograph, the total hydrograph in the receiving stream, and the discharges at the time of the maximum flow from the contaminated subbasin.

As an example, the following equations are used to calculate the dilution factors for the WPA subbasin (waste pit area) of the HEC-1 model used for contaminant calculations. The total hydrograph (including subbasin WPA) in the receiving stream is STA 70 in the HEC-1 model (Figure F.2.2-7). The dilution factors for the other contaminated subbasins are calculated in a similar manner.

$$DF_{(WPA)} = qp_{WPA} \,/\, Q_{STA70(WPA)} \qquad \text{(F.2-8)}$$

where

$DF_{(WPA)}$ = dilution factor for subbasin WPA (dimensionless)
$qp_{(WPA)}$ = peak flow from subbasin WPA (volume/time)
$Q_{STA70(WPA)}$ = flow rate in the STA 70 hydrograph at the same time as the peak flow in subbasin WPA (volume/time)

The concentration in Paddys Run due to subbasin WPA can then be calculated with the following equation:

$$C_{Paddy(WPA)} = C_{e(WPA)} \left(DF_{(WPA)}\right) \qquad \text{(F.2-9)}$$

where

$C_{Paddy(WPA)}$ = concentration in Paddys Run due to subbasin WPA (mass/volume)
$C_{e(WPA)}$ = concentration of contaminant in the runoff from subbasin WPA (mass/volume); calculation of this value is described in Section F.2.2.4.2

Weighted Contaminant Concentrations for Multiple Subbasins Entering Paddys Run

The contaminated flow entering Paddys Run at cross section C-C is due to the flow from subbasins WPA and 570 (Figure F.2.2-6). The contaminated flow entering Paddys Run at cross section E-E is due to the four contaminated subbasins (PDAR, 580, 581, 582) that drain to the SSOD. The HEC-1 model combined the runoff hydrographs of the contaminated subbasins flowing to cross sections C-C and E-E at stations 70 CT and STA 80 (Figure F.2.2-7), respectively. The combined hydrographs at those two stations are used to simulate the incoming contaminated flow to Paddys Run.

The concentration in the combined hydrographs at stations 70 CT and STA 80 is based on the average concentration from the contributing contaminated subbasins. The average concentration is based on a volume weighing of the concentrations in the runoff from each of the contaminated subbasins.

The average concentration of the flow from subbasins 570 and WPA entering Paddys Run at cross section C-C is given by the following equation:

$$C_{570-WPA} = \left(C_{e(WPA)}\ V_{WPA} + C_{e(570)}\ V_{570}\right) / \left(V_{WPA} + V_{570}\right) \qquad \text{(F.2-10)}$$

where

$C_{570\text{-}WPA}$ = volume weighted average concentration entering Paddys Run at cross section C-C due to subbasins 570 and WPA (mass/volume)

$C_{e(WPA)}$ = concentration in the runoff from subbasin WPA (mass/volume)

V_{WPA} = total volume of runoff from subbasin WPA (volume)

$C_{e(570)}$ = concentration in the runoff from subbasin 570 (mass/volume)

V_{570} = total volume of runoff from subbasin 570 (volume)

The above equation can also be used to model the current conditions at the FEMP in which the flow from the waste pit area is collected and pumped to the Great Miami River. To model that scenario,

000425

the terms pertaining to the waste pit area would simply be deleted from the above equation. The equation used to calculate the average concentration in the SSOD is similar and is presented in the SWF&IM report.

Maximum Concentrations in Paddys Run

The maximum concentration of contaminants in Paddys Run at cross sections C-C, D-D and E-E is based on the peak incoming flow, the incoming concentration, and the concentration already in Paddys Run. Calculating the concentration at the time of the peak discharge is similar to the approach used for calculating the dilution factors for each individual contaminated subbasin. This yields the maximum concentrations in Paddys Run. In some instances the concentration of flow in Paddys Run from upstream may have a higher concentration than the incoming flow. In these cases the concentration in Paddys Run from upstream was taken as the maximum concentration at that point.

The maximum concentration in Paddys Run due to incoming contaminated subbasins WPA and 570 at cross-section location C-C is given by the following equation:

$$C_{Paddy(CC)} = \left(C_{Paddys(560)}\, Q_{ROUTE0(70CT)} + C_{(570-WPA)}\,(qp_{(70CT)})\right) / \left(Q_{STA70(70ct)}\right) \qquad \text{(F.2-11)}$$

where

$C_{Paddy(CC)}$ = maximum concentration in Paddys Run at cross-section location C-C

qp_{70CT} = peak discharge from the combination of subbasins 570 and WPA hydrographs (Station 70CT) (volume / time)

$Q_{STA70(70CT)}$ = discharge in the total hydrograph in Paddys Run at the same time as the peak discharge qp_{70CT} (volume / time)

$Q_{ROUTE0(70CT)}$ = discharge in the upstream hydrograph in Paddys Run at the same time as the peak discharge qp_{70CT} (volume / time)

$C_{Paddys(560)}$ = concentration in Paddys Run due to subbasin 560

The equations for the maximum concentration at cross sections D-D and E-E are similar and are presented in the SWF&IM report.

Maximum Concentration in the Great Miami River at the Confluence with Paddys Run

The maximum concentration in the Great Miami River is calculated by taking the maximum concentration in Paddys Run at the confluence with the Great Miami River multiplied by a dilution factor between Paddys Run and the Great Miami River. This dilution factor is the peak flow rate in Paddys Run at the confluence of Paddys Run and the Great Miami River from the HEC-1 model divided by the average flow rate in the Great Miami River. The concentration in the Great Miami River is given by the following equation.

$$C_{GMR} = C_{Paddy(MAX)} \left(qp_{paddy}\right) / \left(qp_{paddy} + Q_{Great\ Miami\ River\ (avg)}\right) \qquad \text{(F.2-12)}$$

where

C_{GMR} = concentration in the Great Miami River (mass/volume)

qp_{paddy} = peak flow rate in Paddys Run at the confluence with the Great Miami River (volume/time)

$Q_{GMR(avg)}$ = average discharge in the Great Miami River (from previous studies, 3460 cfs [DOE 1993a])

$C_{Paddy(MAX)}$ = maximum of $C_{Paddy(CC)}$, $C_{Paddy(DD)}$, and $C_{Paddy(EE)}$

The dilution factor is calculated as 0.1050 when including flow from the former production area (future conditions) and 0.1004 when excluding the production area (baseline conditions).

The maximum concentration in Paddys Run at the confluence with the Great Miami River is calculated by taking the maximum of the concentrations in Paddys Run at cross sections C-C, D-D, and E-E. That concentration is then diluted by the flow of incoming subbasins at the time that Paddys Run is peaking. The following equation is used to calculate the maximum concentration in Paddys Run at the confluence with the Great Miami River.

$$C_{Paddy\ (at\ GMR)} = \qquad \text{(F.2-13)}$$

$$C_{Paddys(MAX)} \left(qp_{Rout25} / Q_{STA130\ (Rout25)}\right) \left(qp_{Rout27} / Q_{STA100(Rout27)}\right) \left(qp_{Rout3} / Q_{STA120(Rout3)}\right)$$

000427

where

$C_{Paddy(at\ GMR)}$ = maximum concentration in Paddys Run at the confluence with Great Miami River (mass/volume)

qp_{Rout25} = peak discharge in Paddys Run at cross section F-F before addition of incoming flow at cross section F-F (cfs)

$Q_{STA130(Rout25)}$ = total discharge in Paddys Run at cross section F-F when upstream hydrograph (Rout25) peaks (cfs)

qp_{Rout27} = peak discharge in Paddys Run at cross section G-G before addition of incoming flow at cross section G-G (cfs)

$Q_{STA100(Rout27)}$ = total discharge in Paddys Run at cross section G-G when upstream hydrograph (Rout27) peaks (cfs)

qp_{Rout3} = peak discharge in Paddys Run at cross section H-H before addition of incoming flow at cross section H-H (cfs)

$Q_{STA120(Rout3)}$ = total discharge in Paddys Run at cross section H-H when upstream hydrograph (Rout3) peaks (cfs)

Concentration in the Great Miami River at the Effluent Line

For baseline conditions, the runoff around the production area (PDAR) and the waste pit areas are collected in the storm water retention basin and discharged to the Great Miami River. Two concentrations are calculated; the first is the concentration due to the representative storm event, the other is a year-long average. The following assumptions are made in calculating the concentration in the Great Miami River at the outfall line:

- Runoff from the representative storm event flows to the storm water retention basin and is released to the Great Miami River over one week.
- Both dissolved and adsorbed phase contaminants are used in calculating the concentration in the Great Miami River.
- One-third of the average flow in the Great Miami River is used for mixing with the flow from the outfall line; this is based on the regulated allowable mixing zones for Ohio (EPA 1984).
- It is assumed that four pumping wells used to remediate the groundwater also discharge to the outfall line; the wells are assumed to each pump at a flow rate of 300 gallons per minute (gpm) and contain 50 μg/L of U-238.

- The permitted National Pollutant Discharge Elimination System (NPDES) allowable amount of uranium to be discharged to the Great Miami River is 1700 lbs per year; the yearly amount of U-238 discharged to the Great Miami River is limited to 1700 lbs for the purpose of calculating a yearly average concentration.

The concentration in the Great Miami River is calculated by summing the amount of contaminant released (adsorbed and dissolved from areas WPA and PDAR and from the pumping wells) and dividing by the total volume of water available for the same time frame. The total flow of water is the sum of one-third of the average flow in the Great Miami River, the runoff volume from subbasins PDAR and WPA, and the flow from the pumping wells.

F.2.2.4.4 Contaminant Loadings to the Great Miami Aquifer

The contaminant transport in the Great Miami Aquifer is modeled to determine groundwater exposure point concentrations. The amount of contaminant infiltrating through the streambeds of Paddys Run and the SSOD is input as loading terms to the groundwater solute transport model. Loading for two cases are calculated; one from the single representative storm event and another average rate to represent all of the storm events occurring during the year. The procedures to determine these two loading rates are presented below.

Single Storm Event Loadings

Contaminant loadings are calculated for each of the three stream reaches C-C to D-D, D-D to E-E, and E-E to F-F in Paddys Run where infiltration through the streambed is significant and for the SSOD. The cross section locations are shown in Figures F.2.2-5 and F.2.2-6.

The contaminant loadings to the Great Miami Aquifer produced from the representative storm are calculated by determining the mass of dissolved contaminant that would enter the Great Miami Aquifer through each channel reach. The amount of mass that enters the Great Miami Aquifer is based on the percent of a contaminated subbasin's total flow which infiltrates into the streambed per channel reach. The percent of total runoff that infiltrates is correlated to the percent of the total dissolved contaminant in the runoff which enters the Great Miami Aquifer. The percent of each contaminated subbasin's total runoff which infiltrates into each channel reach is then required for loading calculations.

To be conservative, the procedure for estimating concentrations in the groundwater due to infiltration through the streambeds of Paddys Run and the SSOD is based on infiltration calculations that assume the streambeds are initially unsaturated. This condition creates the upper bound of infiltration and also the upper bound of the contaminant passing through the streambed. This represents the worst-case scenario for loadings to the Great Miami Aquifer from surface water infiltrating through the streambeds.

The infiltration rates through the streambeds of Paddys Run and the SSOD vary with both distance and time. The runoff flow rate and hence the dissolved contaminant flow rate from each different subbasin also varies with time. Because of the varying surface water flow and infiltration rates, an overall average of the amount of infiltration versus the overall total runoff might overestimate the amount of contamination infiltrating from one subbasin while underestimating the amount from another. The percent of infiltration attributed to each subbasin in each channel reach in Paddys Run is calculated to describe the complex nature of the infiltration into the streambeds of Paddy Run and the SSOD. The procedures to calculate the percent of runoff which infiltrates into each channel reach during the representative storm event was presented in the SWF&IM report. The results of the infiltration calculations were also presented in that report and are reproduced in Tables F.2.2-5 and F.2.2-6.

The contaminant loadings to the Great Miami Aquifer in channel reach C-C to D-D is the result of contaminated flow in subbasins 560, WPA, and 570 (flow from subbasin 575 is assumed to enter Paddys Run at cross-section location D-D). The following equation is used to calculate the amount of mass which infiltrates through the Paddys Run streambed between cross sections C-C and D-D.

$$M_{C-D} = PQ_{i(560)}\left(I_{560(c-d)}\right) + \left(PQ_{i(WPA)} + PQ_{i(570)}\right)\left(I_{WPA(570)}\right) \qquad \text{(F.2.14)}$$

where

M_{C-D} = mass of contaminant infiltrating into channel reach C-C to D-D (g)

$PQ_{i(560)}$ = mass of contaminant in the runoff from subbasin 560 (g)

$PQ_{i(WPA)}$ = mass of contaminant in the runoff from subbasin WPA (g)

$PQ_{i(570)}$ = mass of contaminant in the runoff from subbasin 570 (g)

$I_{560(c\text{-}d)}$ = percentage of total runoff from subbasin 560 which infiltrates into the stream reach between C-C and D-D (dimensionless)

$I_{(WPA\text{-}570)}$ = percentage of total runoff from subbasin WPA and 570 which infiltrates into the stream reach between C-C and D-D (dimensionless)

The equations for the other channel reaches D-D to E-E, E-E to F-F, and the SSOD are similar.

Maximum Great Miami Aquifer Concentrations

The maximum Great Miami Aquifer concentrations due to the loadings from infiltration through the channel reaches are based on the single storm event loadings. The concentration is calculated using the volume of a Sandia Waste Isolation Flow and Transport (SWIFT) cell. For each channel reach, the portion of the total contaminant mass which will enter each cell is determined. The concentration is given by the following equation from reach C-C to D-D. The equations for the other reaches are similar.

$$C_{GMA(C\text{-}D)} = \left(\left(M_{C\text{-}D} \,/\, L_{Reach}\right) L_{Cell}\right) \,/\, V_{Cell} + V_{infil(C\text{-}D)} \qquad \text{(F.2-15)}$$

where

$C_{GMA(C\text{-}D)}$ = concentration in the Great Miami Aquifer under reach C-C to D-D due to infiltration from Paddys Run (mass/volume)

L_{Reach} = length of reach between cross sections C-C to D-D (length)

L_{Cell} = length of SWIFT cell under reach (125 feet)

V_{Cell} = volume of groundwater in layer 1 of the Great Miami Aquifer in the average thickness cell block along Paddys Run or the SSOD

$V_{infil\ (C\text{-}D)}$ = volume of water infiltrating into SWIFT cell

The volume of water in the SWIFT cell is calculated from:

$$V_{cell} = (W_s)\,(L_{cell})\,(T)\,(\phi_{GMA}) \qquad \text{(F.2-16)}$$

000431

where

W_s = average width of the streams used for modeling purposes (25 feet for Paddys Run and 10 feet for the SSOD)

T = saturated thickness of layer 1 of the Great Miami Aquifer in the SWIFT cell (≅ 15 feet)

ϕ_{GMA} = total porosity of the Great Miami Aquifer (0.30)

The volume of infiltration infiltrating into a SWIFT cell under Paddys Run between cross sections C-C and D-D is given by the following equation:

$$V_{infil(C-D)} = \left(V_{560}\left(I_{560(c-d)}\right) + \left(V_{WPA} + V_{570}\right)\left(I_{WPA-570}\right)\right)\left(L_{cell} / L_{reach}\right) \qquad \text{(F.2-17)}$$

where

V_{560} = total volume of runoff from subbasin 560 (volume)

V_{WPA} = total volume of runoff from subbasin WPA (volume)

V_{570} = total volume of runoff from subbasin 570 (volume)

Yearly Loadings

The annual amount of contaminant being loaded to the Great Miami Aquifer is calculated based on the annual amount of dissolved contaminant released from each subbasin. The annual amount of dissolved contaminant released from each subbasin is calculated with two different procedures. To be conservative, the procedure which produced the higher amount of dissolved contaminant is used in predicting the annual contaminant loadings to the Great Miami Aquifer. The two procedures both relate the ratio of dissolved contaminant produced from the representative storm to yearly amounts of other parameters which are more readily estimated. One procedure relates the dissolved contaminant mass to the yearly amount of sediment produced. The other procedure relates the dissolved contaminant mass to the yearly amount of runoff produced.

The first procedure to calculate the amount of dissolved contaminant produced from all storms during the year assumes the ratio of sediment produced and the amount of dissolved contaminant in the runoff is constant for all storm events. The single storm event calculations using MUSLE provides

this ratio. The universal soil loss equation (USLE) (EPA 1988) is used to calculate the annual amount of sediment produced. If the ratio of dissolved contaminant to sediment remains the same throughout the year and the annual amount of sediment is known, then the annual amount of dissolved contaminant in the runoff can be calculated.

The USLE equation can be modified to include a term called the sediment delivery ratio. The sediment delivery ratio represents the percentage of sediment that actually reaches the subbasin outlet to the total amount that is produced in the subbasin. To be conservative, the sediment delivery ratio is assumed to be 1 in calculating the yearly amount of dissolved contaminant. The calculated sediment delivery ratio is used in determining the yearly sediment yield from the subbasin to Paddys Run.

The second procedure to calculate the amount of dissolved contaminant produced from all storms during the year assumes the concentration of contaminants in the runoff is constant for all storm events. The single storm event calculations provide this concentration. The annual amount of runoff from each subbasin is calculated by assuming the ratio of rainfall to runoff for the representative storm event is the same as the ratio of annual rainfall to annual runoff. The annual amount of rainfall is available from meteorological records for the area. If the ratio of dissolved contaminant to runoff remains the same throughout the year and the annual amount of runoff is known, then the annual amount of dissolved contaminant in the runoff can be calculated.

Because most storm events that occur during the year are likely to be smaller than the representative storm and produce less runoff and a greater percentage of infiltration, it is conservatively assumed that all the contaminant produced for the yearly loading, other than the representative storm, enters the Great Miami Aquifer. The total yearly loading is taken as the annual dissolved contaminant amount minus the amount produced during the representative storm. The amount calculated to infiltrate into the streambeds during the representative storm event is then added to yield the yearly total loading.

F.2.3 CONTAMINANT LOADING DETERMINATION

The source of contamination in the surface water pathway used for modeling is assumed to be the surface soil in and around the FEMP. The concentrations of contaminants in the surface soil used for modeling are based on sampling results. The amount of contaminant which can be released to the

surface water is dependent on a geochemical parameter; the soil/water partitioning coefficient, or K_d. The K_d is a measure of the tendency for a solute to be sorbed onto soil. Once the K_d values and source concentrations have been determined, a screening is performed to eliminate contaminants from the surface water modeling process which do not pose a significant risk. The determination of source concentrations, geochemical parameters, and the screening processes are described in the following sections.

F.2.3.1 Contaminant Source Areas and Concentrations

Discussion of the delineation of source areas is presented in Sections 5.3.2.2 and 5.2.2.4. Figure F.2.3-1 shows the final delineation of the source areas (34) which are used for all contaminants; each source area is given a designation that relates to the drainage subbasin where it is located. Then each source area within the drainage subbasin is designated with a letter (i.e., 560a, 560b, etc.). Source areas defined in other operable unit studies are assigned names which correspond to the titles used in the previous studies. For example, area SWL is the solid waste landfill which is part of Operable Unit 2.

For each of the remaining source areas, surface soil samples in the top 1.5 feet are statistically analyzed to determine a representative concentration for each contaminant in each source area. The procedure presented in Appendix A, Attachment A.2.I describes the statistical process. If a contaminant is detected above background in any source area, a concentration is required for each source area to be able to evaluate the accumulative effects of all of the source areas. If a contaminant is analyzed for in a source area but is not detected, the background concentration is assigned to that area. If a contaminant is not analyzed for in a source area but a concentration is required, a concentration is "borrowed" from an adjacent area or an area that was likely to contain similar levels of contamination. Two to four source areas are grouped together from which concentrations could be borrowed. The borrowing process can best be explained with a short example. For instance, three source areas (A,B, and C) are grouped together because they are suspected of having similar levels of contamination; in addition, a particular constituent was not analyzed for in area B. The representative concentration of either area A or C could be assigned to area B. If only one of areas A or C is immediately adjacent to area B, then that area's concentration is borrowed. If both areas A and C are adjacent to area B, then the higher of the representative concentration for the areas A or C is assigned to area B. In some instances, entire groups of source areas require borrowed concentrations. When this happens the concentrations are borrowed from another group of source areas or, depending on the

area and the expected amount of contamination, background levels could be assigned. In order to simplify the implementation of this process, a flow chart (Figure F.2.3-2) indicates which source areas are borrowed from which group. All of the source areas and their initial groups are shown on the right side of the figure; the dots indicate places were borrowing takes place. Figure F.2.3-2 contains four levels of borrowing. Borrowing within the production area always used the group suspected of containing higher levels of contamination. This is indicated in the lower portion of the figure by the arrows connecting groups. Figure F.2.3-2 accounts for every possible case of borrowing between the 34 source areas. Usually only borrowing within the initial groups is required.

During the borrowing process the source areas from other operable units are assigned their present concentrations (before remediation). This was done so that if a source area adjacent to one of the other operable unit source areas requires a concentration, the background concentration would not be used. This would be a more realistic assumption since the areas adjacent to the other operable units would not be remediated for the baseline conditions for Operable Unit 5. Attachment F.2.I presents all of the source concentrations for the 34 source areas for baseline conditions.

The depletion of source soil by erosion was evaluated by calculating the amount of soil depth lost to erosion during the 1000-year modeling time frame. The maximum amount of erosion in any of the subbasins is predicted to be less than 8 inches. This is less than the assumed 18-inch depth of the contaminated source soil, so that the contaminated source soil would not erode away during the modeling time frame. The depletion of the source soil by erosion is not included in the surface water modeling since it would not have an effect on the model source terms.

The source concentrations used for future conditions are adjusted to account for radioactive decay and biodegradation of the contaminants in the 70 years from the beginning of the baseline conditions. The decay rates are presented in the next section. Attachment F.2.I also presents the source concentrations after 70 years of decay. The inorganics are assumed to not experience any decay so the source concentrations do not change from the baseline conditions.

F.2.3.2 Geochemical Parameters

Several geochemical parameters specific to each source area and to each chemical are needed to simulate the transport of the contaminants in the surface water. The soil/water partitioning coefficient (K_d) is required for each source area and each chemical. The K_d coefficients used for radionuclides

and inorganics in the surface soil are presented in Tables F.2.3-1 through F.2.3-2. Where site-specific data is not available, literature values are used for radionuclides and inorganic contaminants.

When a site-specific or literature-based value is not available for a given organic chemical, its K_d value is calculated using an organic carbon partitioning coefficient or K_{oc}, the amount of carbon present in the soil matrix and the size distribution of the soil. The following equation presented in the Risk Assessment Work Plan Addendum (DOE 1992) was used to calculate the K_d values for organic contaminants:

$$K_d = K_{oc}\left[0.2(1-f)x_{oc}^{s} + (f)(x_{oc}^{f})\right] \qquad \text{(F.2-18)}$$

where

K_d = soil partitioning coefficient (L/kg)
K_{oc} = organic carbon partitioning coefficient (L/kg)
f = mass fraction of silt or clay (dimensionless)
x^s_o = organic carbon content of sand (dimensionless)
x^f_{oc} = organic carbon content of silt-clay (dimensionless)

The organic carbon content of both sand and silt-clay are assumed to equal the fractional organic carbon (FOC) content of the surface soil. The mass fraction of the silt or clay and the FOC in the surface soil is not available from sample data so values are taken from the Hamilton and Butler County Soil Surveys (USDA 1982; 1980). The soil surveys provide maps which identify the soil types found within the study area. The soil surveys also provide numerous parameters and properties of the different soil types, such as grain size data and percent organic matter. The mass fraction of silt or clay (f) is taken as the percent passing the No. 200 sieve (75 microns) as reported in the soil survey. An average value of the mass fraction of silt or clay is determined for each contaminant source area. The percent of organic matter is approximately equal to 1.9 times the FOC value (Maidment 1993). This relationship is used to relate the percent organic matter to the FOC. The FOC values for the surface soil in each of the source areas were all calculated to be approximately one percent so this value is assumed for all the contaminant source areas. FOC and f values are available for Operable Unit 2 contaminant source areas from their analysis and are used for calculating K_d values to be consistent with the Operable Unit 2 reports. The FOC and f values used to calculate the K_d values are presented in Table F.2.3-3.

000436

For many of the organic compounds the octanol-water partitioning coefficient (K_{ow}) is more readily available. K_{ow} can be related to K_{oc} by the following formula presented in the Risk Assessment Work Plan Addendum (DOE 1992).

$$K_{oc} = (0.63)\ K_{ow} \qquad \text{(F.2-19)}$$

The K_{ow} values used to calculate the K_d values are presented in Table F.2.3-4.

F.2.3.3 CPC Screening in the Surface Water Pathway

As discussed in Section 5.3.2.3, each chemical detected above background undergoes a screening process to determine which constituents must be modeled. The screening procedure for CPCs in surface water and in the groundwater are discussed below.

F.2.3.3.1 Initial Toxicity Screening

Chemicals detected above background concentrations in surface soil at the FEMP number 131. The macronutrients (calcium, iron, sodium, etc.,) are first screened out. The maximum water concentration based on the highest representative concentration in any of the source areas and the lowest K_d value used in any of the source areas is then calculated. The maximum concentration is calculated with the following equation:

$$C_{\max(water)} = C_{\max(soil)} \ / \ K_{d(\min)} \qquad \text{(F.2-20)}$$

This concentration is then compared to the 10^{-7} risk-based concentrations for carcinogens or 0.1 hazard quotient (HQ) concentrations for noncarcinogens. These screening concentrations are derived by dividing the 10^{-6} risk-based concentrations or the HQ of 1.0 by 10 (EPA 1991). If a contaminants' maximum concentration in water is below the risk concentration, the contaminant is not simulated in the surface water model. Table F.2.3-5 presents the calculations used for the initial screening. Of the 131 chemicals detected, 41 are screened out. In addition to the chemicals analyzed for at the FEMP, hexavalent chromium is also modeled with the assumption that 10 percent of the measured total chromium in the source surface soil at the FEMP is hexavalent chromium. Short-lived radionuclide progeny products are not modeled separately from their parent radionuclide so that an additional five detected constituents (lead-210, polonium-210, radium-224, radium-228 and

thorium-228) are not modeled separately. A total of 86 constituents are modeled in the FEMP surface water draining to Paddys Run.

Thirty constituents are detected above background in the portion of the site which drains directly to the Great Miami River. Of these, 15 constituents are screened out during the initial toxicity screening leaving another 15 that are modeled in the surface water.

F.2.3.3.2 Surface Water CPC Screening

The approach used to calculate the contaminant concentration in the flow coming from each subbasin was discussed in Section F.2.2.4.2. Those concentrations are compared to the 10^{-7} risk-based concentrations for carcinogens or 0.1 HQ concentrations for noncarcinogens. If the contaminant concentration in the flow from each and every subbasin is below the screening concentrations, then the contaminant is screened out and the concentrations in Paddys Run and the Great Miami River are not calculated. The concentration resulting from flow from multiple subbasins cannot be higher than any of the contributing subbasin's concentrations. Screening the surface water concentrations before mixing with other subbasins will result in a more conservative screening process than if the predicted concentration in Paddys Run was used for the screening.

F.2.3.3.3 Groundwater CPC Screening

The estimated concentrations to the Great Miami Aquifer are compared to the 10^{-7} risk-based concentrations for carcinogens or the 0.1 HQ concentrations for noncarcinogens. If the contaminant concentration in the Great Miami Aquifer is below the screening concentrations, then the contaminant is screened out and the contaminant's migration is not simulated in the groundwater solute transport model.

Determination of the concentration in the Great Miami Aquifer due to contaminants infiltrating through the streambeds of Paddys Run and the SSOD is accomplished by mixing the mass of contaminant which enters the Great Miami Aquifer through the streambed into a SWIFT cell and dividing by the volume of the cell plus the volume of infiltration. A maximum concentration is calculated for Paddys Run and another for the SSOD. The concentrations in the Great Miami Aquifer are given by the following equation:

$$C_{GMA} = M_c / (V_{cell} + v_{infil})! \quad \text{(F.2-21)}$$

where

C_{GMA} = estimated concentration in the Great Miami Aquifer due to contaminated water infiltrating through the streambeds of Paddys Run or the SSOD

M_c = mass of contaminant entering the SWIFT cell

V_{cell} = volume of groundwater in layer 1 of the Great Miami Aquifer in the average thickness cell block along Paddys Run or the SSOD (Equation F.2-16)

V_{Infil} = volume of water infiltrating into the SWIFT cell

The percent of the contaminated subbasin runoff from the 1-year, 24-hour storm event which infiltrates into each channel reach along Paddys Run is presented in Section F.2.2.4.4. These percentages are used to calculate the amount of contaminant mass that enters each SWIFT cell. For screening purposes, the reach length in which the highest percentage of contaminated runoff infiltrates is used to calculate the mass. The mass infiltrating into the SWIFT cell used for screening is given by the following equations:

$$M_{c(Paddys)} = ((PQ_{i(560)}(I_{560(C-D)}) + (PQ_{i(WPA)} + PQ_{i(570)}) + (I_{WPA-570})) / N_{C-D}) + (PQ_{i,575)}(I_{575(D-E)}) \quad \text{(F.2-22)}$$

$$M_{c(SSOD)} = \left((PQ_{i(PDAR)} + PQ_{i(582)} + PQ_{i(581)} + PQ_{i(580)})\,(I_{SSOD})\,/\,N_{SSOD}\right) \quad \text{(F.2-23)}$$

where

$M_{c(Paddys)}$ = maximum mass of contaminant infiltrating into SWIFT cell under Paddys Run (g)

$M_{c(SSOD)}$ = maximum mass of contaminant infiltrating into SWIFT cell under SSOD(g)

$PQ_{i(560)}$ = mass of contaminant in the runoff from subbasin 560 (g)

$I_{560(c-d)}$ = percentage of total runoff from subbasin 560 which infiltrates into the channel reach between C-C and D-D ($I_{upstream}$) (dimensionless)

$N_{C\text{-}D}$ = number of SWIFT cells under channel reach C-C to D-D.

The number of SWIFT cells in the channel reach is calculated by the following equation:

$$N = L_{reach} / L_{cell} \qquad \text{(F.2-24)}$$

The volume of flow which infiltrates each cell is given by the following equation:

$$V_{Infil(PADDY)} = ((V_{(560)}(I_{560(C-D)}) + (V_{(WPA)} + V_{(570)})(I_{WPA-570})) / N_{C-D}) + (V_{(575)}(I_{575(D-E)}) \qquad \text{(F.2-25)}$$

$$V_{Infil(SSOD)} = \left((V_{PDAR} + V_{(582)} + V_{(581)} + V_{(580)})(I_{SSOD}) / N_{SSOD}\right) \qquad \text{(F.2-26)}$$

where

$V_{(560)}$ = total volume of flow from the contaminated subbasin 560 (volume)

$V_{Infil(PADDY)}$ = infiltration volume into a SWIFT cell under Paddys Run used for screening purposes (volume)

$V_{Infil(SSOD)}$ = infiltration volume into a SWIFT cell under the SSOD used for screening purposes (volume)

A concentration in the Great Miami Aquifer for each contaminated subbasin had to be less than the screening levels for the contaminant to be screened out of the groundwater pathway.

Attachment F.2.II provides the output summary tables from the surface water model for the 86 chemicals not screened out in the initial screening for baseline conditions. The contaminants which are not screened out and the major source areas are shown in Table F.2.3-6. The screening results for the future conditions are presented in Attachment F.2.III and Table F.2.3-7.

F.2.4 MODELING RESULTS

The following three sections describe the results for the baseline and future conditions simulated at the FEMP for Operable Unit 5. The surface water modeling results are used as loading terms in the groundwater solute transport model in Appendix F.3 and for the baseline risk assessment described in

Section 6.0 The first two sections describe the baseline and future conditions predicted in the Paddys Run drainage basin. These sections describe the predicted concentrations in sediment, surface water, and in the Great Miami Aquifer due to infiltration from the surface water. The third section reports the surface water modeling results for the portion of the FEMP which does not drain to Paddys Run (the northeast drainage ditch to the north and east of the FEMP).

F.2.4.1 Paddys Run Drainage Baseline Conditions

As was discussed in Section 5.1.2.1, the baseline conditions assume that the other operable units have been remediated and that the storm water controls around the waste pit area (including the silos) and the production area are still in operation. The storm water from the production and waste pit areas is eventually discharged to the Great Miami River. Tables F.2.4-1 through F.2.4-3 summarize the results of the surface water modeling for the baseline conditions. These tables provide results for contaminants not screened out in the CPC screening (Section F.2.3.3). Attachment F.2.II presents the summary output tables from the surface water model for all of the constituents of potential concern (CPOCs) not initially screened out.

Table F.2.4-1 presents the maximum predicted sediment concentration for each contaminant not screened out in the surface water CPC screening and also indicates the drainage course which would receive the maximum sediment concentration. For instance, if the maximum sediment concentration is calculated to occur in subbasin 570, the impacted drainage course is the pilot plant drainage ditch. The highest uranium concentration in sediment is predicted to occur in the pilot plant drainage ditch. The total uranium concentration in this ditch is predicted to be 552 mg/kg. Most of the other radionuclides are predicted to have their maximum concentrations in the ditches north of the production area (due to subbasin 560) and in the ditch east of the production area (due to flow from subbasin 581). The maximum concentration of sediment for inorganics is predicted to occur in the ditches north of the production area. The maximum concentration predicted is for magnesium (31,500 mg/kg) in the ditch east of the production area. The highest concentration predicted for organic contaminants is for benzo(a)pyrene (2.14 mg/kg) in the ditch north of the production area. All of the sediment concentrations for each subbasin for each contaminant are presented in the surface water model summary output sheets in Attachment F.2.II.

Table F.2.4-2 presents a summary of the following surface water concentrations: the maximum concentration in Paddys Run, the year-long average concentration in the Great Miami River at the

discharge outfall line, the maximum week concentration in the Great Miami River at the discharge outfall line, and the maximum concentration in the Great Miami River at the mouth of Paddys Run. The highest predicted concentrations in each of these four surface water locations are for magnesium, then total uranium, manganese, cyanide, and 4-methylphenol. The predicted maximum concentration in Paddys Run for total uranium is 102 μg/L, the maximum concentration in the Great Miami River at the mouth of Paddys Run is predicted to be 8.5 μg/L, and the concentration in the Great Miami River during the maximum week is predicted to be 5.9 μg/L.

Tables F.2.4-3 and F.2.4-4 provide summaries of the maximum concentration and yearly loading, respectively, to the Great Miami Aquifer from the surface water bodies. The concentration and loadings are calculated for three channel reaches in Paddys Run and the SSOD. The loadings and the concentrations are predicted to be highest under the SSOD for most of the CPCs. This is due to the higher contamination around the SSOD and the higher infiltration percentages in the SSOD. The highest loadings and concentrations are for magnesium, manganese, cyanide, and then total uranium. The predicted concentration of uranium total under the SSOD is 97 μg/l and the loading is 45.8 kg/year. Attachment F.2.II presents the concentration for all of the contaminants modeled for baseline conditions.

F.2.4.2 Paddys Run Drainage Future Conditions

As was discussed in Section 5.1.2.1, the future conditions assume that the other operable units have been remediated and that the storm water controls around the waste pit area (including the silos) and the production area are no longer in operation. The storm water from the production area and the waste pit area then return to their natural drainage paths (i.e., the waste pit area to Paddys Run and the production area to the SSOD). Tables F.2.4-5 through F.2.4-8 summarize the results of the surface water modeling for the future conditions for the chemicals not screened out in the CPC screening. Attachment F.2.III presents the summary output tables from the surface water model for all of the chemicals modeled for the future conditions.

Table F.2.4-5 is similar to Table F.2.4-1 and presents the same type of data for the future condition. For most of the CPCs, the maximum concentrations in the sediment are predicted to occur in the SSD or the ditch east of the production area. The total uranium concentration in the SSOD is predicted to be 3380 mg/kg. These high concentrations are due to the modeled conditions of removing the buildings in the production area and exposing the contaminated soil. The maximum concentration of

sediment for inorganics are predicted to occur in several different drainage subbasins. The maximum concentration predicted is for magnesium (31,500 mg/kg) in the ditch east of the production area (due to subbasin 581). This is the same as in the baseline condition since the inorganics are assumed to not decay and subbasin 581 lies outside of any of the storm water controls. The highest concentration predicted for organic contaminants is for 4-methylphenol in the lower SSOD (due to subbasin 582). All of the sediment concentrations for each subbasin for each contaminant are presented in the surface water model summary output sheets in Attachment F.2.III.

Table F.2.4-6 presents a summary of the maximum surface water concentrations in Paddys Run and in the Great Miami River at the mouth of Paddys Run. Concentrations are not calculated at the discharge outfall line because under the future conditions it is assumed that this line and the rest of the storm water controls are not in operation. The highest predicted concentration in both of these surface water locations is for magnesium, then total uranium, manganese, and cyanide. The predicted maximum total-uranium concentration in Paddys Run is 1980 μg/L and 174 μg/L in the Great Miami River at the mouth of Paddys Run.

Tables F.2.4-7 and F.2.4-8 provide summaries of the maximum concentrations and yearly loading, respectively, to the Great Miami Aquifer from the surface water bodies for future conditions. The concentrations and loadings are calculated for three cross sections in Paddys Run and the SSOD. The loadings and the concentrations are predicted to be highest under the SSOD for most of the CPCs. This is due to the higher contamination around the SSOD and the higher infiltration percentages in the SSOD. The highest loading and concentration are for total uranium with a predicted concentration under the SSOD of 1760 μg/L and a loading of 1460 kg/year. Attachment F.2.III presents the concentrations for all of the contaminants modeled for future conditions.

F.2.4.3 Northeast Drainage Ditch

Table F.2.4-8 summarizes the results of the five constituents which are not screened out based on the predicted surface water concentration: arsenic, beryllium, manganese, strontium-90, and total uranium. The concentrations for sediments and surface water are calculated at two points. The first point is at the surface water sampling location located approximately 900 feet east of the FEMP property line and the second is at the FEMP property line. The predicted concentrations at the FEMP property line are higher than at the sampling point. The baseline and future concentrations are nearly identical because most of the constituents not screened out either do not decay or have very

long half-lives. The highest predicted concentrations at the sampling point are for manganese (170 μg/L in surface water and 876 mg/kg in sediment). The predicted concentration of manganese at the fenceline is 225 μg/L in surface water and 1170 mg/kg in the sediment. The predicted concentrations at the property line for total uranium are 4 μg/L and 24.7 mg/kg in surface water and sediment, respectively; the predicted concentrations at the sampling point are 1.0 μg/L and 7.0 mg/kg in surface water and sediment, respectively. Attachment F.2.IV presents the calculations concerning the northeast drainage ditch of the FEMP.

F.2.5 MODEL PERFORMANCE EVALUATION

To evaluate the performance of the surface water model the current site conditions are modeled and compared to sampling data. The evaluation of the model is focused primarily on total uranium since this appears to be the one of the most prevalent contaminants at the FEMP and the contaminant for which the most sample data is available for comparison. The predicted concentrations in the surface water, sediment, and in the Great Miami Aquifer near Paddys Run and the SSOD are compared to the sample data in the environmental media and estimates from other studies.

F.2.5.1 Current Contaminant Source Terms

293 As in the baseline and future conditions, the source terms for the current conditions are based on surface soil sampling data. The source terms for the baseline and future conditions are based on the upper confidence limit (UCL) on the mean or median depending on the number of sample data points in each source area. This provides a conservative source concentration to be used in predicting concentrations for risk assessment purposes. To evaluate the model, it is felt that the average of the sampling data provides a less conservative but more reasonable source concentration when comparing the model output to sampling data. The UCL was used for all of the source-concentration terms in which the modeling results were used in the risk assessment including the surface water, groundwater, and air modeling. Using the UCL is more conservative but can create much higher contaminant concentrations when compared to field measurements. The UCL provided the upper bound of the likely actual source concentration (the UCL on the mean of the surface soil data). In order to compare the model output to sampling data taken in the surface water, sediment, and groundwater, it was felt that a representative concentration that reflected the central tendency of the surface soil data rather than the upper bound of the mean contaminant level would be closer to the actual representative concentration of the surface soil. The current source term concentrations are then based on the average of the surface soil sampling data. For current conditions, the other operable units are not

remediated; therefore the source concentrations used are taken from the other operable unit RI reports. For baseline and future conditions, these operable units are assumed to be remediated and the background concentration is used for their source terms.

To simulate the current conditions, two sets of source terms are developed to provide a range of values to compare to the sampling data. The first set of source terms includes all of the samples taken under the buildings in the former production area (as in the baseline and future conditions). The second set of source terms excludes the samples under the buildings because rainfall cannot directly come in contact with this soil and become runoff while the building are still intact. Only source areas PAc, PAd, PAe, PAg, and PAh contained samples under buildings; therefore, only those terms and the source areas which may have "borrowed" concentrations (see Section F.2.3.1) from these areas changed in the second source set. Both sets of source terms are run with and without the storm water controls in place so that data from years before the storm water controls were put into operation can also be compared. The current condition source concentrations are presented with the surface model output sheets contained in Attachment F.2.V.

F.2.5.2 Simulated Current Surface Water Concentrations

The current simulated surface water concentrations are compared to sampling data taken from the surface water in and around the FEMP. Table F.2.5-1 presents a comparison of the modeled and sampled results for total uranium concentrations at nine different locations. The modeled results are compared to the range of sampled results for filtered samples taken between 1988 and 1993 except for the comparison with the northeast drainage ditch of the FEMP which is compared to samples taken in 1993. In some cases (subbasins 560 and 581) the sampled data was not taken at the subbasin outlet. In these cases, a second surface water concentration for that subbasin is calculated based on only the source areas which drain to the sampling point in the subbasin. The source areas usually still do not exactly match the areas which drain to the sampling point but do more closely match the drainage area than the whole subbasin. Both of these modeled concentrations are presented for comparison in Table F.2.5-1. The range of modeled results for the production area are from model runs with and without samples under the buildings. The modeled concentrations in the SSOD, Paddys Run, and the Great Miami River are for the case with storm water controls since the sampled data was taken after the storm water retention basin was put into operation.

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In general, the sampled results match the modeled results fairly well with a few exceptions. The modeled concentrations in the pilot plant drainage ditch are significantly lower than the range of sampled results. This may be due to contaminants coming from sources other than the surface soil that are not modeled in the surface water pathway, such as discharges from the pilot plant. The concentration predicted in the northeast ditch is lower than the measured results, although the difference is approximately only 10 μg/L. This may be due to seepage of water directly out of the source soil to the water course which could generate a higher concentration but a smaller amount of contaminant being released. During a storm event the runoff is diluted somewhat by the excess rainwater running off the ground surface. If the representative soil concentration (24.7 mg/kg) for total uranium in this area is converted to a liquid concentration using K_l/K_d (222 L/kg) the liquid concentration would be 111 μg/L.

F.2.5.3 Simulated Current Sediment Concentrations

The modeled current sediment concentrations are compared to sampled data taken in drainage channels in and around the FEMP. Table F.2.5-2 presents a comparison of the modeled and sampled results for total uranium concentrations at eight different locations. The modeled results are compared to the same years of data as the surface water comparison in the previous section. As with the surface water, in some cases the sampled data was not taken at the subbasin outlet. The results for these cases are presented in the same manner as in the surface water section. The range of modeled results for the production area are from model runs with and without samples under the buildings. The modeled concentrations in the SSOD are for the case with storm water controls since the sampled data was taken after the storm water retention basin was put into operation. The concentration in the SSOD is a flow volume weighted average of the sediment concentrations from subbasins 580, 581, and 582.

294 Overall, the sampled results match the modeled results fairly well. The modeled result for the SSOD is higher than the sampled results, which may be due to the deposition of contaminated sediment before the surface water enters the SSOD. Under current conditions, most of the contaminated surface water entering the SSOD originates from subbasin 581. The sediment concentrations in this subbasin match fairly well with the sampled results, possibly indicating that the sediment is deposited there and does not reach the SSOD. Sampled results from the Environmental Monitoring (EM) program does have some sampled results in the SSOD for total uranium closer to the modeled results. The modeled sediment concentration in the SSOD is 44.5 mg/kg; the sampling results from the EM

data in 1988 indicated a maximum concentration of 114 mg/kg although most of the maximum results in that year are in the 20-30 mg/kg range. The maximum modeled sediment concentration in Paddys Run is predicted to be 157 mg/kg which is higher than the measured range of 1.2-12.5 mg/kg for the years 1988-1993. This may be due to the possibility that contaminated sediment is washed downstream during high flow events. Based on an interpretation of the sediment sampling data, Section 4.5.2.5 indicates that sediment does not accumulate in Paddys Run because it is being swept downstream to the Great Miami River during high flow events. When comparing the modeled and measured sediment concentrations, it is important to note that the modeling results represent sediment conditions before further mixing with bed materials and hydraulic transport (e.g., scouring and deposition) in Paddys Run and the SSOD.

295 The predicted concentrations of sediment in the pilot plant drainage ditch and the waste pit area are higher than the measured concentrations. The difference may be due in part to the sediment being washed downstream into Paddys Run and eventually the Great Miami Aquifer during high flow events. The high flow events can cause scouring of the beds of the ditches leading to Paddys Run as well as the streambed of Paddys Run itself. The sediment sampling data does not show any accumulation of sediment in Paddys Run (see Section 4.5.2.5). The sampling of sediment in the Great Miami River also shows only slightly elevated concentrations of uranium (see Section 4.5.3).

The predicted sediment concentrations coming from the production area are slightly below the range of the measured sediment concentrations coming from the production area. The sediment concentrations measured in the production area were taken in Manhole 175. In addition to surface water runoff, Manhole 175 collects and passes liquids from a variety of sources from the production area. For this reason it is not unexpected that the concentrations measured in this manhole would be elevated above the concentrations predicted for surface water runoff alone.

F.2.5.4 Simulated Surface Water Contaminant Loadings to the Great Miami Aquifer

The modeled results for the current conditions are compared to two types of information to evaluate the model performance. The results are compared to sampled data from monitoring wells in the Great Miami Aquifer. Also discussed in this section is a comparison of the estimated total amount of uranium released to Paddys Run to modeled results.

The modeled results are compared to sample data from Type 2 monitoring wells (screened in the upper Great Miami Aquifer) along Paddys Run and the SSOD. Concentrations in the Great Miami Aquifer are calculated for three channel reaches in Paddys Run and in the SSOD. Monitoring wells are located near Paddys Run channel reaches C-C to D-D, E-E to F-F and in the SSOD (see Figure F.2.3-3). Table F.2.5-3 presents a comparison of the predicted concentration in the Great Miami Aquifer for current conditions and the sampled data from the monitoring wells for total uranium. The predicted concentration in Paddys Run for reach C-C to D-D is for the case without storm water controls because most of the data used in the comparison was taken before the beginning of the operation of the storm water controls around the waste pit area in 1992. The modeled results presented for the SSOD and reach E-E to F-F are for the cases with and without storm water controls. It should be noted that the concentrations predicted by the surface water model only predict concentrations from a single storm event and do not include contamination that may have been present in the aquifer from previous storm events or reached the aquifer via a different contaminant migration pathway, such as vertical migration through the soil to the aquifer. It would be expected that the predicted Great Miami Aquifer concentrations solely due to surface water loading would be less than the measured data. The range of predicted model results falls within the range of sampled results for channel reaches between cross section E-E and F-F and the SSOD. The surface water model conservatively predicted the groundwater concentration to be higher than the sampled range for the channel reach between cross sections C-C and D-D.

The Fernald Dosimetry Reconstruction Project (RAC 1993) estimates the total amount of uranium released to Paddys Run and the SSOD from the FEMP during the years it was in operation (1951-1989) to be 17,000 kg with a range of 14,000 to 20,000 kg. The total amount of total uranium predicted to be released to Paddys Run and the SSOD by the surface water model is compared to the RAC estimates. The amount of total uranium released is calculated with and without samples under buildings in the production area to provide a range of modeled results. The mass of contaminant released is calculated by estimating the yearly amount released in both the adsorbed and dissolved phases for all of the subbasins (see the storm water model output in Attachments F.2.II and F.2.III) and then multiplying by the number of years of operation of the FEMP. For the years from 1951 through 1985 (35 years), the released amount is calculated with the model case in which no storm water controls are in operation. In 1986, the storm water retention basin was put into operation, so the released amount calculated for years 1986 through 1988 (3 years) is based on the modeling case in

which the storm water controls are in operation. The modeled range of total uranium released to Paddys Run and the SSOD is estimated to be 16,400 to 19,800 kg.

296 Based on sampled results, the estimated mass of uranium within the plume of significant concentration (i.e., 10 μg/L) in the Great Miami Aquifer was estimated to be 5100 kg (Table 5-20). The amount of uranium in the Great Miami Aquifer which could be attributed solely to surface water loading was estimated to be about 1900 kg. The measured current plume of uranium contamination south of the SSOD was used to estimate the mass of uranium that was attributed solely to surface water loading. It was compared to surface water modeling results during the model performance evaluation as the minimum estimate that the model should account for. However, it does not represent the total accumulated mass from surface water loading because the uranium plume north of the SSOD was also impacted by surface water loading as well as other contaminant sources. The total amount of total uranium predicted to be released to the Great Miami Aquifer by the surface water model is estimated to be between 10,300 and 13,200 kg. The modeled estimate is based on loadings from the surface water through Paddys Run and the SSOD to the Great Miami Aquifer for 42 years (1951 to 1993). The lower value of the modeled loading results from the source terms which does not include sampling data from under the buildings; the upper estimate is from the source terms which do include sampling data from under the buildings. These results demonstrate some of the conservativeness in the assumptions used in estimating the contaminants amounts that reach the Great Miami Aquifer from surface water, such as the assumption that all of the dissolved contaminant in the runoff for storms other than the representative storm event reach the aquifer.

F.2.6 SENSITIVITY ANALYSIS

In order to determine the model's uncertainty, sensitivity analyses are performed on several of the input parameters. The analyses focus on the sensitivity of the predicted infiltration amount and on the sensitivity of the predicted concentrations in the surface water and sediment.

The sensitivity analyses on the infiltration amount were presented in the SWF&IM report (DOE 1994b). Four sets of simulations were performed to examine the sensitivity of input parameters on the amount of infiltration in Paddys Run and the SSOD. The four simulations varied the Soil Conservation Service (SCS) curve number, the saturated hydraulic conductivity, the groundwater table elevation, and the fitting parameters in the Van Genuchten relative hydraulic

conductivity equation. Each of these parameters and their sensitivity are discussed in detail in the SWF&IM report and are summarized below.

The sensitivity analysis of the SCS curve number (which is used to simulate the rainfall losses and affects the amount of runoff produced from a storm event) indicated that changing the curve numbers so that the runoff volume doubles resulted in less than a 6 percent increase in infiltration amount. The sensitivity analysis also indicated that the predicted runoff volume is very sensitive to the SCS curve number. In the next sensitivity analysis, the saturated hydraulic conductivity was increased and decreased by 50 percent. The increase in saturated hydraulic conductivity produced an increase of 18 percent in the infiltration volume and the decreased conductivity produced a 24 percent decrease in infiltration volume. The relative hydraulic conductivity fitting parameters are used to simulate the movement of water through unsaturated soil beneath the streambed and are based on the soil type. This sensitivity analysis varied the soil type used in the infiltration model. The fitting parameters for sand were used in the infiltration model. The model was rerun using the fitting parameters for fine sand. This change produced a decrease in infiltration amount of 29 percent. The final sensitivity analysis concerning infiltration amount was on the initial groundwater elevation used in the infiltration model. The infiltration model assumed a springtime initial water table elevation; in the sensitivity analysis the water table was lowered to the average groundwater elevation. This produced a 27 percent increase in the infiltration amount.

The contaminant transport equations described in Section F.2.2.4 are input into a spreadsheet to facilitate the calculation of the required concentrations. The output from HEC-1,VS2DT, and contaminant transport parameters are put into the spreadsheet for the contaminant calculations. In order to complete the sensitivity analysis, source concentrations determined by using the preliminary Operable Unit 5 database are input in to the surface water model to be used as a basis for comparison in the sensitivity analyses. This run is labeled sensitivity baseline in the tables presenting the results of the sensitivity analysis. The source concentrations are a preliminary set of source terms for U-238; however, these concentrations are very close to the final source concentrations used in the RI fate and transport modeling. Three parameters are varied to determine the sensitivity of the surface water and sediment concentrations. The SCS curve number, precipitation amount, and soil/water partitioning coefficient are all varied to determine their effect on the surface water and sediment concentrations. The sensitivity analysis of each of these parameters is discussed below.

F.2.6.1 SCS Curve Number Sensitivity Analysis

Three modifications to the original SCS curve numbers are run to determine the effect on the predicted surface water and sediment concentrations. These modifications are the decrease of the curve numbers by 10 percent, the increase of the curve numbers by 10 percent, and the modification of the curve numbers to reflect antecedent moisture conditions III (wetter than average initial soil moisture conditions). All other input parameters are held constant. The infiltration volumes are not adjusted because they will not effect the sediment and surface water concentrations. The predicted infiltration volumes can affect the predicted Great Miami Aquifer loadings although the infiltration volume is fairly insensitive to the SCS curve number.

The concentration of contaminants in the runoff and in the sediment coming from an individual subbasin does not change appreciably with changes in the SCS curve number; however, as the flow from each individual subbasin combines with others and mixes with uncontaminated flow from upstream, the concentrations of contaminants in the sediment and the surface water decrease as the runoff volume (and curve number) increases in Paddys Run and in the SSOD (Table F.2.6-1). This is due to the general result that the peak runoff from uncontaminated upstream areas occurs closer in time to the peak discharges coming from the site as the runoff volume increases. Because of the timing of the peak discharges, there is generally more water available in the Paddys Run and the SSOD as the runoff volume increases to dilute the contaminated runoff from the site when the peak discharge from the site occurs. The use of higher curve numbers will actually result in less conservative results with respect to the concentration of contaminants in the surface water and sediment in Paddys Run and the SSOD.

F.2.6.2 Precipitation Sensitivity Analysis

To test the sensitivity of the surface water and sediment concentrations to the precipitation amount, the precipitation amount was varied in the HEC-1 model and the other parameters held constant. The precipitation is increased by 20 percent and decreased by 20 percent and input into the HEC-1 model. The 20 percent decrease in precipitation resulted in an approximate 50 percent decrease in runoff volume while the 20 percent increase resulted in an approximate 70 percent increase in runoff volume. As with the SCS curve number, the changes in the runoff volume had a comparatively small effect on the concentration of contaminants and the contaminant loading to the Great Miami Aquifer. Table F.2.6-1 presents a summary of the precipitation sensitivity analysis results.

F.2.6.3 Sensitivity Analysis of the Soil/Water Partitioning Coefficient (K_d)

The sensitivity of the surface water and sediment concentrations to the soil/water partitioning coefficient is tested by increasing the K_d value by 10 percent and then decreasing the K_d value by 10 percent. The surface water concentrations varied almost proportionally with the variations in the K_d values so that a 10 percent increase in K_d produced an approximate 10 percent increase in concentrations. The sediment concentrations showed almost no change in concentration with the variation in the K_d values. This may be attributed to the fairly high K_d values used for U-238 for most of the site in the baseline sensitivity conditions (K_d=222). In order to determine if a lower K_d would cause the concentration results to be react differently to a variation in K_d, the K_d value was divided by 1000 and then the K_d increased and decreased by 10 percent. Dividing the U-238 K_d value by 1000 yields K_d values around 0.2. The K_d range between 0.2 to 222 encompasses the K_d values for the majority of the constituents found at the FEMP. After dividing the K_d values by 1000, a 10 percent increase in K_d then produced an approximate 5 percent increase in the sediment concentration and a 4 percent decrease in surface water concentration. The K_d sensitivity analysis results are summarized in Table F.2.6-2.

F.2.6.4 Summary of Sensitivity Analyses

Of the parameters which were evaluated for the sensitivity of the surface water and sediment concentrations, K_d was the most sensitive. The other parameters tested, SCS curve number and precipitation amount, did not have a large effect on the surface water and sediment concentrations.

The loading of contaminants to the Great Miami Aquifer from surface water is primarily controlled by the infiltration amount and the surface water concentration. The infiltration amount is relatively insensitive to the runoff volume (governed by the SCS curve number and the precipitation amount) and the surface water concentration is also relatively insensitive to the runoff volume, so that the loading to the Great Miami Aquifer is also insensitive to the runoff volume.

The sensitivity analyses for the SCS curve number, the saturated hydraulic conductivity, and the relative hydraulic conductivity all produce a change in the total infiltration of 30 percent or less. Under the possible range of values, 30 percent uncertainty is acceptable for the intended use of the model results. The runoff volume from the representative storm event only accounts for about 6 percent of the estimated annual runoff and therefore also only accounts for 6 percent of the annual amount of dissolved contaminant released in the surface water from surface soil. All of the other

94 percent of the annual amount of dissolved contaminant is conservatively assumed to reach the Great Miami Aquifer. The infiltration volume calculated from the representative storm event only accounts for a small amount of the total contaminant loading to the Great Miami Aquifer so that a 30 percent uncertainty is acceptable for the estimate of the infiltration volume from the representative storm event.

F.2.7 SUMMARY

The purpose of surface water modeling at the FEMP is to quantify the effect of rainwater coming into contact with contaminated soil and the subsequent transport of the contaminants with the runoff. The main objectives of modeling the surface water pathway are to predict the concentration of contaminants in surface water and sediment and to estimate the amount of contaminant reaching the groundwater from infiltration through the streambeds of water courses draining the FEMP. These estimates of contaminants reaching the groundwater via surface water are then used as contaminant loading rates in the groundwater solute transport model.

The modeling of the surface water for Operable Unit 5 at the FEMP was completed in two stages and is presented in two reports. The movement of surface water, rainfall, runoff, and infiltration was performed first with the results presented in the SWF&IM (DOE 1994b). The results of the SWF&IM were then incorporated into this RI report to calculate the contaminant transport in the surface water pathway.

The transport of contaminants centers on the use of the MUSLE and partitioning equations, both of which are presented in the Superfund Exposure Assessment Manual (EPA 1988). The MUSLE equation is used to calculate the amount of sediment generated from the representative storm event in each subbasin. The partitioning equations are then used to determine the amount of contaminant transported with the runoff and the amount transported with the sediment. As flows from different subbasins combine, the contaminant concentration in the combined flow is calculated based on a mass balance approach.

The required results of the surface water transport model include the predicted concentration of contaminants in each of the three following environmental media for both baseline and future conditions; surface water, sediment, and groundwater. In order to determine these concentrations, initial soil concentrations and a list of CPCs are required.

The source of contamination in the surface water pathway used for modeling is assumed to be the surface soil in and around the FEMP. The concentrations of contaminants in the surface soil used for modeling are based on sampling results. The drainage subbasins from the HEC-1 model are relatively large and contain a significant areal variation in the contaminant concentrations in the surface soil. To account for this variation, the drainage subbasins were further subdivided based on contaminant concentrations. The assumption of uniform concentrations used in the surface water model is much more reasonable for the smaller areas delineated based on soil concentrations. The study area was divided into 34 source areas. For the source areas, surface soil samples in the top 1.5 feet are statistically analyzed to determine a representative concentration for each contaminant in each source area. The source terms for the baseline and future conditions are based on the UCL on the mean or median depending on the number of sampling data points in each source area.

All of the contaminants detected in the surface soil above background levels undergo an initial toxicity screening to determine which chemicals need to be modeled in the surface water pathway. The CPCs which passed the initial toxicity screening process are then screened again mid-way through the modeling process to determine if the contaminant concentrations pose a significant risk that requires additional modeling in both the surface water and groundwater exposure routes. The results for the constituents not screened out are presented in Tables F.2.4-1 through F.2.4-9 for both the baseline and future scenarios in the following environmental media: sediment, surface water, and in the Great Miami Aquifer.

To evaluate the performance of the surface water model, the current site conditions are modeled and compared to sampling data. The evaluation of the model is focused primarily on total uranium because this appears to be the most prevalent contaminant at the FEMP and the contaminant for which the most sampling data is available for comparison. The predicted concentrations in the surface water, sediment, and in the Great Miami Aquifer near the Paddys Run and the SSOD were compared to the sample data in the environmental media and estimates from other studies.

As in the baseline and future conditions, the source terms for the current conditions are based on surface soil sampling data. The use of the UCL for future and baseline conditions provided a conservative source concentration to be used in predicting concentrations for risk assessment purposes. To evaluate the model, it was felt that the average of the sampled data provided a less conservative but more reasonable source concentration when comparing the modeled output to

sampled data. Section F.2.5 presents a comparison of sample results to modeled results. In general, the modeled results compare fairly well with the sampled results.

F.2.8 REFERENCES

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TABLE F.2.2-1

MAJOR COMPONENTS OF THE SURFACE WATER FLOW AND INFILTRATION MODEL

Model	Description and Use
HEC-1	HEC-1 is a computer model developed by the U.S. Army Corps of Engineers (USCOE 1990) to simulate rainfall and runoff. HEC-1 is used in this modeling effort to estimate the hydrologic parameters of the Paddys Run drainage basin which encompasses the FEMP. The output for HEC-1 is used as input for VS2DT, MUSLE, and the Partitioning Equations.
VS2DT	VS2DT is a computer model developed by the U.S. Geological Survey (USGS 1990) to simulate variably saturated groundwater flow in two dimensions. VS2DT is used in this modeling effort to estimate the amount and pattern of infiltration of surface water through the streambeds of Paddys Run and the SSOD.
MUSLE	The Modified Universal Soil Loss Equation presented in the Superfund Exposure Assessment Manual (EPA 1988) is used to estimate the amount of sediment which is generated by a single storm event. This equation is used in this modeling effort to estimate the amount of sediment generated by the representative storm event.
USLE	The Universal Soil Loss Equation presented in the Superfund Exposure Assessment Manual is used to estimate the annual amount of sediment produced in the subbasins of the Paddys Run drainage basin.
Partitioning Equations	The Partitioning Equations also are presented in the Superfund Exposure Assessment Manual. The partitioning equations consist of a series of equations used to determine the amount and concentration of contaminant released from the source surface soils in the dissolved phase (surface water) and the adsorbed phase (in sediments) from a single storm event.
SWF&IM	The Surface Water Flow and Infiltration Model is the term applied to collectively identify the above models used to simulate the rainfall, runoff, and Contaminant Transport. This is also sometimes referred to generically as the surface water model.

TABLE F.2.2-2

COMPARISON OF MODELED AND MEASURED INCREASE OF PADDYS RUN FLOW DEPTHS[a]

		Cross Section C-C		Cross Section E-E	
Date of Storm Event	Precipitation Amount (inches)[b]	Measured Rise in Stream Depth (Stilling Well 9) (feet)[c]	Modeled Rise in Stream Depth (STA70) (feet)[d]	Measured Rise in Stream Depth (Stilling Well 14) (feet)[c]	Modeled Rise in Stream Depth (STAEE) (feet)[d]
April 3-4, 1989	1.92	4.06	3.99	5.51	5.35
April 28-29, 1989	1.96	2.39	3.13	4.98	4.17

[a]U.S. Department of Energy, 1994a, "Response to Comments on Surface Water Flow and Infiltration Model Summary Report," submitted to the U.S. EPA at the Technical Information Exchange meeting, April 26, 1994, DOE, Fernald Field Office, Cincinnati, Ohio.

[b]Precipitation amounts from raingauge at the FEMP, except portion of April 28-29 storm which is supplemented with data from the Greater Cincinnati Airport due to missing data from the FEMP rain gauge.

[c]DOE 1990, Stream depth rise taken from data presented in Groundwater Report, Feed Materials Production Center (DOE 1990).

[d]Stream depth calculated from Paddys Run flow rate predicted with HEC-1 output and Mannings equation.

TABLE F.2.2-3

DATA FROM HEC-1[a]

Subbasin[b]	Runoff Depth (in.)	Area (mi^2)	Runoff Volume (ft^3)	Peak Discharge	Total Hydrograph	Flow when Contributing Subbasin Peaks	Dilution Factor
Without Stormwater Controls							
SUB 560	0.23	0.32	1.70×10^5	12.0	STA 60	60.0	0.200
WPA	0.73	0.07	1.20×10^5	27.0	STA 70	53.0	0.509
SUB 570	0.73	0.12	1.99×10^5	30.0	STA 70	48.0	0.625
SUB 575	0.45	0.12	1.23×10^5	16.0	STA 75	76.0	0.211
SUB 580	0.52	0.04	4.34×10^4	6.0	STA J-J	137.0	0.044
PDAR	1.26	0.24	7.06×10^5	180.0	STA J-J	194.0	0.928
SUB 581	0.43	0.46	4.49×10^5	48.0	STA J-J	115.0	0.417
SUB 582	0.34	0.49	3.68×10^5	30.0	STA 80	101.0	0.297
STA 80			1.57×10^6	196.0	STA E-E	199.0	0.985
STA 70 CT			3.19×10^5	53.0	STA 70	53.0	1.000
With Stormwater Controls							
SUB 560	0.23	0.32	1.70×10^5	12.0	STA 60	60.0	0.200
SUB 570	0.73	0.12	2.04×10^5	30.0	STA 70	31.0	0.968
SUB 575	0.45	0.12	1.25×10^5	16.0	STA 75	61.0	0.262
SUB 580	0.52	0.04	4.83×10^4	6.0	STA J-J	47.0	0.128
SUB 581	0.43	0.46	4.60×10^5	48.0	STA J-J	53.0	0.906
SUB 582	0.34	0.49	3.87×10^5	30.0	STA 80	69.0	0.435
STA 80			8.95×10^5	78.0	STA E-E	134.0	0.582

[a]Results from the SWF&IM Summary Report (DOE, 1994b)
[b]WPA - waste pit area; PDAR - production area; STA - station; STA 70 CT - Station 70-contaminant transport

TABLE F.2.2-4

PARAMETERS USED IN SURFACE WATER MODEL

Variables	Units	Sub560	WPA	Sub570	Sub575	Sub580	PDAR	Sub581	Sub582	NE all	NE On-Site
Curve number SCS[a]	unitless	62.6	76.85	76.7	69.82	71.95	86.2	69.43	66.53	65.4	65.4
Erosion control practice factor P[b]	unitless	1	1	1	1	1	0.5	1	1	1	1
Rainfall/runoff factor Rr[c]	100 m-tonne-cm/ha-hr	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6	303.6
Soil erodibility factor K[d]	Tonnes/ha/Rr	0.43	0.48	0.53	0.52	0.56	0.48	0.48	0.48	0.48	0.48
Cover factor C[e]	unitless	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Product of slope length factor and slope steepness factor LS[f]	unitless	0.9	0.28	0.19	0.18	1.2	0.135	2	0.32	0.30	0.30
Available water capacity[g]	unitless	0.22	0.22	0.2	0.21	0.2	0.22	0.23	0.22	0.22	0.22
Soil bulk density[h]	g/cm^3	1.45	1.48	1.33	1.36	1.36	1.4	1.48	1.41	1.45	1.45

[a]SCS curve numbers calculated in the "Surface Water Flow and Infiltration Model Summary Report," Table 3-2, Draft Final, DOE, 1994.
[b]U.S. EPA, 1988. "Superfund Exposure Assessment Manual." Office of Remedial Response, Washington, DC, EPA/5401/1-88/001, EPA, 1988 and site-specific information.
[c]U.S. EPA, 1985, "A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water - Part 1 (Revised 1985)," Environmental Research Laboratory, Athens, GA, EPA/600/6-85/002a, EPA, 1985, p. 160 and Figure III-10.
[d]Based on a weighted average of K values for soil types within each drainage basin. K values are from the soil surveys of Hamilton (USDA, 1982) and Butler (USDA, 1980) counties.
[e]U.S. EPA, 1988. "Superfund Exposure Assessment Manual." Office of Remedial Response, Washington, DC, EPA/540/1-88/001, EPA, 1988, Table 2-4, and site-specific information.
[f]U.S. EPA, 1988. "Superfund Exposure Assessment Manual." Office of Remedial Response, Washington, DC. EPA/540/1-88/001, EPA, 1988, Figure 2-6, and site-specific information.
[g]Based on weighted average of available water capacity reported in soil surveys of Hamilton (USDA 1982) and Butler (USDA 1980) counties.
[h]Based on weighted average of bulk densities reported in soil surveys of Hamilton (USDA 1982) and Butler (USDA 1980) counties.

TABLE F.2.2-5

SUMMARY OF SUBBASIN AND REACH-SPECIFIC INFILTRATION RESULTS IN PADDYS RUN[a]

Cross Section Location	Total Surface Water Volume (ft^3)	Total Infiltration Volume (ft^3)	Infiltration Volume from Sub 70 (ft^3)		Infiltration Volume from Sub 75 (ft^3)		Infiltration Volume from STA 80 (ft^3)		Infiltration from Upstream of Sub 70 (ft^3)	
Without Stormwater Controls										
C-C to D-D	$6.62 \times 10^{+6}$	$1.38 \times 10^{+6}$	$9.01 \times 10^{+4}$	25.2%					$1.29 \times 10^{+6}$	20.6%
D-D to E-E	$7.07 \times 10^{+6}$	$5.70 \times 10^{+5}$	$4.04 \times 10^{+4}$	11.3%	$6.21 \times 10^{+4}$	13.9%			$4.68 \times 10^{+5}$	7.5%
E-E to F-F	$8.64 \times 10^{+6}$	$6.69 \times 10^{+4}$	$4.96 \times 10^{+3}$	1.4%	$4.37 \times 10^{+3}$	1.0%	$1.72 \times 10^{+4}$	1.1%	$4.04 \times 10^{+4}$	0.6%
Total		$2.02 \times 10^{+6}$	$1.36 \times 10^{+5}$	37.9%	$6.65 \times 10^{+4}$	14.9%	$1.72 \times 10^{+4}$	1.1%	$1.80 \times 10^{+6}$	28.7%
With Stormwater Controls										
C-C to D-D	$6.62 \times 10^{+6}$	$1.38 \times 10^{+6}$	$9.01 \times 10^{+4}$	25.2%					$1.29 \times 10^{+6}$	20.6%
D-D to E-E	$7.07 \times 10^{+6}$	$5.69 \times 10^{+5}$	$3.98 \times 10^{+4}$	11.1%	$6.17 \times 10^{+4}$	13.8%			$4.68 \times 10^{+5}$	7.5%
E-E to F-F	$7.93 \times 10^{+6}$	$6.61 \times 10^{+4}$	$5.89 \times 10^{+3}$	1.6%	$5.03 \times 10^{+3}$	1.1%	$1.27 \times 10^{+4}$	1.5%	$4.25 \times 10^{+4}$	0.7%
Total		$2.02 \times 10^{+6}$	$1.36 \times 10^{+5}$	37.9%	$6.67 \times 10^{+4}$	14.9%	$1.27 \times 10^{+4}$	1.5%	$1.80 \times 10^{+6}$	28.8%

[a]Results from the SWF&IM Summary Report (DOE 1994b)

TABLE F.2.2-6

SUMMARY OF INFILTRATION RESULTS IN THE STORM SEWER OUTFALL DITCH (SSOD)[a]

	Future	Baseline
Total infiltration in the SSOD (ft^3)	$5.90 \times 10^{+5}$	$2.79 \times 10^{+5}$
Total flow in the SSOD (ft^3)	$1.198 \times 10^{+6}$	$4.921 \times 10^{+5}$
Percent of flow which infiltrates	49.2%	56.6%

[a]Results from the SWF&IM Summary Report (DOE 1994b)

TABLE F.2.3-1

FATE AND TRANSPORT PARAMETERS OF RADIONUCLIDE CONSTITUENTS

Constituent of Potential Concern	Contaminant Source Material/ Glacial Overburden K_l/K_d (mL/g)	Great Miami Aquifer K_d (mL/g)	λ^a (1/day)	K_e (%)	Screening Level[b] (pCi/L)	Specific Activity (pCi/μg)
Actinium-227	$2.40 \times 10^{+03}$	$4.50 \times 10^{+02}$	8.72×10^{-05}	NA	1.70×10^{-02}	$7.24 \times 10^{+07}$
Cesium-137	$1.81 \times 10^{+03}$	$1.37 \times 10^{+03}$	6.29×10^{-05}	NA	1.70×10^{-01}	$8.65 \times 10^{+07}$
Lead-210	$3.00 \times 10^{+03}$	$3.80 \times 10^{+01}$	8.53×10^{-05}	NA	9.30×10^{-03}	$7.64 \times 10^{+07}$
Neptunium-237	$5.50 \times 10^{+01}$	$5.00 \times 10^{+00}$	8.87×10^{-10}	NA	2.20×10^{-02}	$7.05 \times 10^{+02}$
Plutonium-238	$1.70 \times 10^{+03}$	$1.00 \times 10^{+02}$	2.16×10^{-05}	NA	2.20×10^{-02}	$1.71 \times 10^{+07}$
Plutonium-239/240	$1.70 \times 10^{+03}$	$1.00 \times 10^{+02}$	7.87×10^{-08}	NA	2.10×10^{-02}	$6.21 \times 10^{+04}$
Polonium-210	$3.00 \times 10^{+03}$	$1.50 \times 10^{+02}$	5.01×10^{-03}	NA	3.20×10^{-02}	$3.88 \times 10^{+18}$
Protactinium-231	$2.70 \times 10^{+03}$	$5.50 \times 10^{+02}$	5.81×10^{-08}	NA	5.20×10^{-02}	$4.72 \times 10^{+04}$
Radium-224	$6.96 \times 10^{+02}$	$1.06 \times 10^{+02}$	1.92×10^{-01}	NA	1.30×10^{-01}	$1.59 \times 10^{+11}$
Radium-226	$6.96 \times 10^{+02}$	$1.06 \times 10^{+02}$	1.19×10^{-06}	NA	4.00×10^{-02}	$9.89 \times 10^{+05}$
Radium-228	$6.96 \times 10^{+02}$	$1.06 \times 10^{+02}$	3.30×10^{-04}	NA	4.80×10^{-02}	$2.72 \times 10^{+08}$
Ruthenium-106	$8.00 \times 10^{+02}$	$5.50 \times 10^{+01}$	$1.89 \times 10^{+03}$	NA	5.00×10^{-01}	$3.36 \times 10^{+09}$
Strontium-90	$1.00 \times 10^{+01}$	$2.50 \times 10^{+00}$	6.64×10^{-05}	NA	1.40×10^{-01}	$1.37 \times 10^{+08}$
Technetium-99	1.18×10^{-01}	7.00×10^{-02}	8.92×10^{-09}	NA	$3.70 \times 10^{+00}$	$1.70 \times 10^{+04}$
Thorium-228	$5.80 \times 10^{+03}$	$3.20 \times 10^{+03}$	9.93×10^{-04}	NA	4.30×10^{-01}	$8.20 \times 10^{+08}$
Thorium-230	$5.80 \times 10^{+03}$	$3.20 \times 10^{+03}$	2.47×10^{-08}	NA	3.70×10^{-01}	$2.06 \times 10^{+04}$
Thorium-232	$5.80 \times 10^{+03}$	$3.20 \times 10^{+03}$	1.36×10^{-13}	NA	4.00×10^{-01}	1.10×10^{-01}
Uranium-Total	$1.50 \times 10^{+01}$	$1.78 \times 10^{+00}$	4.25×10^{-13}	30-50[c]	3.00×10^{-01}	NA

[a]λ - Radioactive decay rate
[b]Based on 10^{-7} risk or 0.1 hazard quotient level
[c]Not used in RI
NA Not Available or Not Applicable

TABLE F.2.3-2

FATE AND TRANSPORT PARAMETERS OF INORGANIC CONSTITUENTS

Constituents of Potential Concern	Glacial Overburden K_l/K_d (L/kg)	Great Miami Aquifer K_l/K_d (L/kg)	Screening Level[a] (mg/L)
Aluminum	$1.50 \times 10^{+03}$	$1.50 \times 10^{+03}$	11×10^{0}
Antimony	$2.50 \times 10^{+02}$	$4.50 \times 10^{+01}$	1.500×10^{-03}
Arsenic	$2.00 \times 10^{+02}$	$2.00 \times 10^{+02}$	4.900×10^{-06}
Barium	$1.14 \times 10^{+03}$	$2.00 \times 10^{+01}$	2.600×10^{-01}
Beryllium	$1.30 \times 10^{+03}$	$2.50 \times 10^{+02}$	2.000×10^{-06}
Boron	$3.00 \times 10^{+00}$	$3.00 \times 10^{+00}$	3.300×10^{-01}
Cadmium	$5.00 \times 10^{+02}$	$1.20 \times 10^{+01}$	1.800×10^{-03}
Calcium	$5.00 \times 10^{+01}$	$5.00 \times 10^{+00}$	NA
Chromium	$1.50 \times 10^{+03}$	$7.00 \times 10^{+01}$	1.800×10^{-02}
Cobalt	$5.50 \times 10^{+02}$	$6.00 \times 10^{+01}$	2.200×10^{-01}
Copper	$1.25 \times 10^{+02}$	$3.50 \times 10^{+01}$	1.4×10^{-1}
Cyanide	4.29×10^{-02}	1.85×10^{-02}	7.300×10^{-02}
Iron	$1.65 \times 10^{+02}$	$2.20 \times 10^{+02}$	NA
Lead	$3.00 \times 10^{+03}$	$3.80 \times 10^{+01}$	1.5×10^{-3}
Magnesium	$4.50 \times 10^{+00}$	$4.50 \times 10^{+00}$	$3.500 \times 10^{+01}$
Manganese	$1.80 \times 10^{+02}$	$5.00 \times 10^{+01}$	1.800×10^{-02}
Mercury	$1.00 \times 10^{+01}$	$1.00 \times 10^{+01}$	1.100×10^{-03}
Molybdenum	$9.00 \times 10^{+01}$	$1.00 \times 10^{+01}$	1.800×10^{-02}
Nickel	$6.50 \times 10^{+02}$	$4.00 \times 10^{+02}$	7.300×10^{-02}
Potassium	$7.50 \times 10^{+01}$	$1.50 \times 10^{+01}$	NA
Selenium	$7.40 \times 10^{+02}$	$1.50 \times 10^{+02}$	1.800×10^{-02}
Silicon	$3.50 \times 10^{+01}$	$1.80 \times 10^{+02}$	NA
Silver	$1.80 \times 10^{+02}$	$9.00 \times 10^{+01}$	1.800×10^{-02}
Sodium	$1.00 \times 10^{+02}$	$1.00 \times 10^{+02}$	NA
Thallium	$1.50 \times 10^{+03}$	$1.50 \times 10^{+03}$	2.600×10^{-04}
Vanadium	$1.00 \times 10^{+03}$	$2.00 \times 10^{+02}$	2.600×10^{-02}
Zinc	$2.40 \times 10^{+03}$	$2.00 \times 10^{+02}$	$1.100 \times 10^{+00}$

[a]Based on 10^{-7} risk or 0.1 hazard quotient level
NA Not Available

TABLE F.2.3-3

SURFACE SOIL PARAMETERS USED TO CALCULATE K_l/K_d

Area	FOC %	% Passing No. 200 Sieve
560A	1	87.5
560B	1	86
560C	1	87.5
560D	1	85
SWL	1	85
570A	1	88
570B	1	90
570C	1	85
570D	1	85
570E	1	90
575A	1	87.5
575B	1	90
SF	1	85
580A	1	87.5
581A	1	85
581B	1	85
581C	1	82
581D	1	85
582A	1	82
582B	1	85
AFP	1	85

TABLE F.2.2-3 (Continued)

Area	FOC %	% Passing No. 200 Sieve
PAA	1	85
PAB	1	85
PAC	1	85
PAD	1	85
PAE	1	85
PAF	1	85
PAG	1	85
PAH	1	85
PAI	1	85
LSP	1	85
WPAA	1	85
WPA.OU1	1	85
WPA.OU4	1	85
NEa	1	87.5
NEb	1	87.5

TABLE F.2.3-4

FATE AND TRANSPORT PARAMETERS OF ORGANIC CONSTITUENTS

Constituents of Potential Concern	KOW[a]	λ^b (1/day)	Screening Level[c] (mg/ℓ)
1,1-Dichloroethane	$3.887 \times 10^{+01}$	1.13×10^{-03}	9.700×10^{-02}
1,1-Dichloroethene	$1.903 \times 10^{+01}$	3.85×10^{-03}	6.700×10^{-06}
1,1,1-Trichloroethane	$1.859 \times 10^{+02}$	6.30×10^{-04}	1.510×10^{-01}
1,1,2-trichloroethane	$1.859 \times 10^{+02}$	4.70×10^{-04}	3.200×10^{-05}
1,1,2,2-tetrachloroethane	$1.550 \times 10^{+02}$	3.79×10^{-03}	9.000×10^{-06}
1,2-dichloroethane	$1.777 \times 10^{+01}$	9.50×10^{-04}	2.000×10^{-05}
1,2-Dichloroethene (tot)	$1.903 \times 10^{+01}$	9.50×10^{-04}	3.700×10^{-02}
2-Butanone	$1.140 \times 10^{+00}$	2.48×10^{-02}	$2.190 \times 10^{+00}$
2-chlorophenol	$8.883 \times 10^{+01}$	0.00	1.800×10^{-02}
2-hexanone	$1.512 \times 10^{+01}$	0.00	1.460×10^{-01}
2-methylnaphthalene	$4.561 \times 10^{+03}$	0.00	1.46×10^{-1}
2-methylphenol	$5.613 \times 10^{+01}$	0.00	1.830×10^{-01}
2,4-dichlorophenol	$3.541 \times 10^{+02}$	9.90×10^{-03}	1.100×10^{-02}
2,4-dimethylphenol	$1.657 \times 10^{+02}$	2.48×10^{-02}	7.300×10^{-02}
2,4-dinitrotoluene	$5.985 \times 10^{+01}$	1.90×10^{-03}	1.300×10^{-05}
2,6-dinitrotoluene	$1.197 \times 10^{+02}$	1.90×10^{-03}	1.300×10^{-05}
3,3'-dichlorobenzidine	$2.041 \times 10^{+03}$	1.90×10^{-03}	1.900×10^{-05}
4-chloro-3-methylphenol	$7.938 \times 10^{+02}$	0.00	1.83×10^{-1}
4-Methyl-2-Pentanone	$7.749 \times 10^{+00}$	2.48×10^{-02}	1.830×10^{-01}
4-methylphenol	$5.002 \times 10^{+01}$	0.00	1.830×10^{-01}
4-nitroaniline	$1.544 \times 10^{+01}$	0.00	1.100×10^{-02}
4-nitrophenol	$5.122 \times 10^{+01}$	7.07×10^{-02}	2.260×10^{-01}
4,4'-DDE	$5.733 \times 10^{+06}$	1.20×10^{-04}	2.500×10^{-05}
4,4'-DDT	$9.765 \times 10^{+05}$	0.00	2.500×10^{-05}
Acenaphthene	$5.242 \times 10^{+03}$	1.70×10^{-03}	2.190×10^{-01}
Acenaphthylene	$7.371 \times 10^{+03}$	1.70×10^{-03}	1.46×10^{-1}
Acetone	3.591×10^{-01}	2.48×10^{-02}	3.650×10^{-01}
Aldrin	$8.127 \times 10^{+04}$	5.93×10^{-04}	5.000×10^{-07}
Alpha-chlordane	$3.799 \times 10^{+02}$	0.00	6.600×10^{-06}
Anthracene	$1.764 \times 10^{+04}$	3.80×10^{-04}	$1.095 \times 10^{+00}$

TABLE F.2.3-4 (Continued)

Constituents of Potential Concern	KOW[a]	λ[b] (1/day)	Screening Level[c] (mg/ℓ)
Arochlor-1254	$6.741 \times 10^{+05}$	0.00	1.100×10^{-06}
Arochlor-1260	$8.127 \times 10^{+05}$	0.00	1.100×10^{-06}
Benzene	$8.505 \times 10^{+01}$	9.50×10^{-04}	6.200×10^{-05}
Benzoic acid	$4.670 \times 10^{+01}$	9.90×10^{-02}	$1.460 \times 10^{+01}$
Benzo(a)anthracene	$2.520 \times 10^{+05}$	2.50×10^{-04}	7.700×10^{-06}
Benzo(a)pyrene	$6.017 \times 10^{+05}$	2.50×10^{-04}	1.200×10^{-06}
Benzo(b)fluoranthene	$2.344 \times 10^{+06}$	2.80×10^{-04}	9.500×10^{-06}
Benzo(g,h,i)perylene	$1.071 \times 10^{+07}$	2.70×10^{-04}	1.46×10^{-1}
Benzo(k)fluoranthene	$4.360 \times 10^{+06}$	8.00×10^{-05}	2.200×10^{-05}
Benzyl alcohol	$7.938 \times 10^{+00}$	0.00	$1.095 \times 10^{+00}$
Beta-BHC	$3.975 \times 10^{+03}$	2.80×10^{-03}	4.700×10^{-06}
Bis(2-chloroisopropyl)ether	$7.938 \times 10^{+01}$	0.00	4.200×10^{-05}
Bis(2-ethylhexyl)phthalate	$1.260 \times 10^{+05}$	1.78×10^{-03}	6.100×10^{-04}
Bromodichloromethane	$4.782 \times 10^{+01}$	0.00	1.400×10^{-04}
Bromomethane	$7.938 \times 10^{+00}$	1.82×10^{-02}	1.080×10^{-03}
Butylbenzylphthalate	$3.799 \times 10^{+03}$	3.85×10^{-03}	7.300×10^{-01}
Carbazole	$1.229 \times 10^{+03}$	0.00	4.300×10^{-04}
Carbon disulfide	$9.135 \times 10^{+01}$	6.20×10^{-03}	2.800×10^{-03}
Chlorobenzene	$4.360 \times 10^{+02}$	1.16×10^{-03}	5.200×10^{-03}
Chloroform	$5.878 \times 10^{+01}$	3.79×10^{-03}	2.800×10^{-05}
Chrysene	$2.520 \times 10^{+05}$	1.70×10^{-04}	2.700×10^{-04}
Dibenzofuran	$8.316 \times 10^{+03}$	6.19×10^{-03}	1.5×10^{-2}
Dibenzo(a,h)anthracene	$5.878 \times 10^{+05}$	1.80×10^{-04}	1.100×10^{-06}
Dieldrin	$7.749 \times 10^{+03}$	2.71×10^{-04}	5.300×10^{-07}
Diethylphthalate	$4.668 \times 10^{+01}$	3.09×10^{-03}	$2.920 \times 10^{+00}$
Di-n-butyl phthalate	$9.954 \times 10^{+04}$	3.01×10^{-02}	3.650×10^{-01}
Di-n-octylphthalate	$9.954 \times 10^{+08}$	1.90×10^{-03}	7.300×10^{-02}
Endosulfan II	$2.627 \times 10^{+03}$	0.00	7.4×10^{-2}
Endosulfan sulfate	$2.879 \times 10^{+03}$	0.00	7.4×10^{-2}
Endrin	$2.507 \times 10^{+05}$	0.00	1.100×10^{-03}
Endrin Aldehyde	$8.820 \times 10^{+02}$	0.00	1.1×10^{-3}
Ethylbenzene	$8.820 \times 10^{+02}$	3.04×10^{-03}	1.580×10^{-01}

TABLE F.2.3-4 (Continued)

Constituents of Potential Concern	KOW[a]	λ[b] (1/day)	Screening Level[c] (mg/ℓ)
Fluoranthene	$1.348 \times 10^{+05}$	3.90×10^{-04}	1.460×10^{-01}
Fluorene	$9.450 \times 10^{+03}$	5.77×10^{-03}	1.460×10^{-01}
Heptachlor Epoxide	$2.835 \times 10^{+02}$	6.28×10^{-04}	2.000×10^{-07}
Heptachlorodibenzofurans	$4.164 \times 10^{+05}$	6.19×10^{-03}	5.7×10^{-9}
Hexachlorobutadiene	$3.799 \times 10^{+04}$	1.90×10^{-03}	2.300×10^{-05}
Indeno(1,2,3-cd)pyrene	$2.879 \times 10^{+07}$	2.40×10^{-04}	4.300×10^{-06}
Isophorone	$3.156 \times 10^{+01}$	1.24×10^{-02}	9.000×10^{-03}
Methoxychlor	$3.018 \times 10^{+04}$	1.90×10^{-03}	1.800×10^{-02}
Methylene chloride	$1.121 \times 10^{+01}$	2.48×10^{-02}	6.300×10^{-04}
Napthalene	$1.449 \times 10^{+03}$	2.69×10^{-03}	1.460×10^{-01}
N-nitroso-di-n-propylamine	$1.953 \times 10^{+01}$	1.90×10^{-03}	1.200×10^{-06}
N-nitrosodiphenylamine	$8.505 \times 10^{+02}$	1.02×10^{-02}	1.700×10^{-03}
Octachlorodibenzofuran	$5.878 \times 10^{+07}$	6.19×10^{-03}	5.7×10^{-8}
Octachlorodibenzo-p-dioxin	$6.615 \times 10^{+06}$	0.00	5.7×10^{-8}
Phenanthrene	$1.827 \times 10^{+04}$	8.70×10^{-04}	1.46×10^{-1}
Phenol	$1.814 \times 10^{+01}$	2.48×10^{-02}	$2.190 \times 10^{+00}$
Pyrene	$9.513 \times 10^{+04}$	9.00×10^{-05}	1.100×10^{-01}
Styrene	$5.613 \times 10^{+02}$	3.30×10^{-03}	2.800×10^{-04}
Tetrachloroethene	$2.136 \times 10^{+02}$	4.20×10^{-04}	3.700×10^{-02}
Toluene	$3.087 \times 10^{+02}$	3.30×10^{-03}	9.300×10^{-02}
Tributylphosphate	$6.300 \times 10^{+03}$	0.00	1.800×10^{-02}
Trichloroethene	$2.136 \times 10^{+02}$	4.20×10^{-04}	2.500×10^{-04}

[a]KOW - Octanol/water partition coefficient
[b]λ-Degradation rate; if lambda value was not available from literature, 0 was conservatively assumed
[c]Based on 10^{-7} risk or 0.1 hazard quotient level

TABLE F.2.3-5

INITIAL TOXICITY SCREENING

Constituents of Potential Concern	Maximum Soil Conc. (mg/kg)	Minimum K_l/K_d (L/kg)	Predicted Water Conc. (μg/L)	10^{-7} Risk or 0.1 HQ (μg/L)	Screened Out Yes/No
Radionuclides					
Actinium-227	5.46×10^{-08}	$2.40 \times 10^{+03}$	2.27×10^{-08}	1.88×10^{-10}	No
Cesium-137	3.35×10^{-08}	$1.81 \times 10^{+03}$	1.85×10^{-08}	1.97×10^{-09}	No
Lead-210	4.85×10^{-07}	$3.00 \times 10^{+03}$	1.62×10^{-07}	1.22×10^{-10}	No
Neptunum-237	3.73×10^{-03}	$5.50 \times 10^{+01}$	6.78×10^{-02}	3.07×10^{-05}	No
Plutonium-238	8.83×10^{-06}	$1.70 \times 10^{+03}$	5.19×10^{-06}	1.27×10^{-09}	No
Plutonium-239/240	2.08×10^{-04}	$1.70 \times 10^{+03}$	1.22×10^{-04}	3.33×10^{-07}	No
Polonium-210	1.88×10^{-08}	$4.00 \times 10^{+02}$	4.70×10^{-08}	7.07×10^{-12}	No
Protactinium-231	1.07×10^{-04}	$2.70 \times 10^{+03}$	3.95×10^{-05}	1.10×10^{-06}	No
Radium-224	2.27×10^{-11}	$6.96 \times 10^{+02}$	3.27×10^{-11}	7.88×10^{-13}	No
Radium-226	2.98×10^{-03}	$6.96 \times 10^{+02}$	4.29×10^{-03}	5.95×10^{-09}	No
Radium-228	2.01×10^{-06}	$6.96 \times 10^{+02}$	2.88×10^{-06}	1.75×10^{-10}	No
Ruthenium-106	3.14×10^{-09}	$8.00 \times 10^{+02}$	3.92×10^{-09}	1.49×10^{-10}	No
Strontium-90	4.74×10^{-08}	$1.00 \times 10^{+01}$	4.74×10^{-06}	9.66×10^{-10}	No
Technetium-99	1.34×10^{-02}	1.18×10^{-01}	$1.14 \times 10^{+02}$	2.15×10^{-04}	No
Thorium-228	2.15×10^{-07}	$5.80 \times 10^{+03}$	3.70×10^{-08}	5.28×10^{-10}	No
Thorium-230	1.33×10^{-01}	$5.80 \times 10^{+03}$	2.30×10^{-02}	1.78×10^{-05}	No
Thorium-232	$2.57 \times 10^{+03}$	$5.80 \times 10^{+03}$	$4.44 \times 10^{+02}$	2.55×10^{-01}	No
Thorium-234	9.87×10^{-08}	$5.80 \times 10^{+03}$	1.70×10^{-08}	5.17×10^{-11}	No
Uranium, total	$4.31 \times 10^{+04}$	$1.50 \times 10^{+01}$	$2.87 \times 10^{+06}$	1.10×10^{-02}	No
Uranium-234	$2.13 \times 10^{+00}$	$1.50 \times 10^{+01}$	$1.42 \times 10^{+02}$	4.78×10^{-05}	No
Uranium-235/236	$4.40 \times 10^{+02}$	$1.50 \times 10^{+01}$	$2.93 \times 10^{+04}$	1.38×10^{-01}	No
Uranium-238	$4.26 \times 10^{+04}$	$1.50 \times 10^{+01}$	$2.84 \times 10^{+06}$	5.06×10^{-01}	No
Organics					
1,1,1-Trichloroethane	2.10×10^{-01}	$1.59 \times 10^{+00}$	$1.32 \times 10^{+02}$	$1.51 \times 10^{+02}$	Yes
1,1,2,2-Tetrachloroethane	1.90×10^{-01}	$1.33 \times 10^{+00}$	$1.43 \times 10^{+02}$	8.96×10^{-03}	No
1,1,2-Trichloroethane	1.40×10^{-02}	$1.59 \times 10^{+00}$	$8.80 \times 10^{+00}$	3.19×10^{-02}	No
1,1-Dichloroethane	1.20×10^{-02}	3.33×10^{-01}	$3.61 \times 10^{+01}$	$9.73 \times 10^{+01}$	Yes

TABLE F.2.3-5 (Continued)

Constituents of Potential Concern	Maximum Soil Conc. (mg/kg)	Minimum K_l/K_d (L/kg)	Predicted Water Conc. (μg/L)	10^{-7} Risk or 0.1 HQ (μg/L)	Screened Out Yes/No
1,1-Dichloroethene	3.90×10^{-02}	1.63×10^{-01}	$2.39 \times 10^{+02}$	6.68×10^{-03}	No
1,2-Dichloroethane	2.00×10^{-03}	1.56×10^{-01}	$1.28 \times 10^{+01}$	1.97×10^{-02}	No
1,2-Dichloroethene (total)	3.40×10^{-01}	1.63×10^{-01}	$2.09 \times 10^{+03}$	$3.70 \times 10^{+01}$	No
2,4-Dichlorophenol	1.00×10^{-01}	$3.03 \times 10^{+00}$	$3.30 \times 10^{+01}$	$1.10 \times 10^{+01}$	No
2,4-Dimethylphenol	7.00×10^{-02}	$1.46 \times 10^{+00}$	$4.79 \times 10^{+01}$	$7.30 \times 10^{+01}$	Yes
2,4-Dinitrotoluene	5.30×10^{-02}	5.27×10^{-01}	$1.01 \times 10^{+02}$	1.25×10^{-02}	No
2,6-Dinitrotoluene	1.10×10^{-02}	$1.05 \times 10^{+00}$	$1.05 \times 10^{+01}$	1.25×10^{-02}	No
2-Butanone	7.40×10^{-02}	9.76×10^{-03}	$7.58 \times 10^{+03}$	$2.19 \times 10^{+03}$	No
2-Chlorophenol	4.80×10^{-02}	7.82×10^{-01}	$6.14 \times 10^{+01}$	$1.83 \times 10^{+01}$	No
2-Hexanone	2.00×10^{-03}	1.29×10^{-01}	$1.55 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
2-Methylnaphthalene	$1.30 \times 10^{+00}$	$3.90 \times 10^{+01}$	$3.33 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
2-Methylphenol	4.50×10^{-02}	4.94×10^{-01}	$9.11 \times 10^{+01}$	$1.83 \times 10^{+02}$	Yes
3,3'-Dichlorobenzidine	1.90×10^{-01}	$1.79 \times 10^{+01}$	$1.06 \times 10^{+01}$	1.89×10^{-02}	No
4,4'-DDE	3.80×10^{-02}	$4.91 \times 10^{+04}$	7.74×10^{-04}	2.50×10^{-02}	Yes
4,4'-DDT	1.90×10^{-02}	$8.36 \times 10^{+03}$	2.27×10^{-03}	2.50×10^{-02}	Yes
4-Chloro-3-Methylphenol	4.60×10^{-02}	$6.98 \times 10^{+00}$	$6.59 \times 10^{+00}$	$1.83 \times 10^{+02}$	Yes
4-Methyl-2-Pentanone	1.60×10^{-01}	6.63×10^{-02}	$2.41 \times 10^{+03}$	$1.83 \times 10^{+02}$	No
4-Methylphenol	$1.70 \times 10^{+00}$	4.40×10^{-01}	$3.86 \times 10^{+03}$	$1.83 \times 10^{+02}$	No
4-Nitroaniline	3.30×10^{-01}	1.36×10^{-01}	$2.43 \times 10^{+03}$	$1.10 \times 10^{+01}$	No
Acenaphthene	$1.60 \times 10^{+00}$	$4.49 \times 10^{+01}$	$3.57 \times 10^{+01}$	$2.19 \times 10^{+02}$	Yes
Acenaphthylene	$3.10 \times 10^{+00}$	$6.34 \times 10^{+01}$	$4.89 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
Acetone	1.50×10^{-01}	3.07×10^{-03}	$4.88 \times 10^{+04}$	$3.65 \times 10^{+02}$	No
Aldrin	1.60×10^{-03}	$6.95 \times 10^{+02}$	2.30×10^{-03}	5.01×10^{-04}	No
Alpha-chlordane	5.10×10^{-03}	$3.25 \times 10^{+00}$	$1.57 \times 10^{+00}$	6.55×10^{-03}	No
Anthracene	$9.80 \times 10^{+00}$	$1.51 \times 10^{+02}$	$6.49 \times 10^{+01}$	$1.10 \times 10^{+03}$	Yes
Aroclor-1254	$1.40 \times 10^{+01}$	$5.77 \times 10^{+03}$	$2.43 \times 10^{+00}$	1.11×10^{-03}	No
Aroclor-1260	$2.10 \times 10^{+00}$	$6.96 \times 10^{+03}$	3.02×10^{-01}	1.11×10^{-03}	No
Benzene	5.00×10^{-03}	7.28×10^{-01}	$6.87 \times 10^{+00}$	6.18×10^{-02}	No
Benzo(a)anthracene	$9.20 \times 10^{+00}$	$2.16 \times 10^{+03}$	$4.26 \times 10^{+00}$	7.74×10^{-03}	No
Benzo(a)pyrene	$1.20 \times 10^{+01}$	$5.15 \times 10^{+03}$	$2.33 \times 10^{+00}$	1.17×10^{-03}	No

TABLE F.2.3-5 (Continued)

Constituents of Potential Concern	Maximum Soil Conc. (mg/kg)	Minimum K_l/K_d (L/kg)	Predicted Water Conc. (μg/L)	10^{-7} Risk or 0.1 HQ (μg/L)	Screened Out Yes/No
Benzo(b)fluoranthene	$1.50 \times 10^{+01}$	$2.01 \times 10^{+04}$	7.48×10^{-01}	9.46×10^{-03}	No
Benzo(g,h,i)perylene	$8.70 \times 10^{+00}$	$9.17 \times 10^{+04}$	9.49×10^{-02}	$1.46 \times 10^{+02}$	Yes
Benzo(k)fluoranthene	$1.20 \times 10^{+01}$	$3.73 \times 10^{+04}$	3.22×10^{-01}	2.24×10^{-02}	No
Benzoic acid	6.80×10^{-01}	4.00×10^{-01}	$1.70 \times 10^{+03}$	$1.46 \times 10^{+04}$	Yes
Benzyl alcohol	2.90×10^{-01}	6.98×10^{-02}	$4.15 \times 10^{+03}$	$1.10 \times 10^{+03}$	No
Beta-BHC	2.20×10^{-01}	$3.40 \times 10^{+01}$	$6.47 \times 10^{+00}$	4.73×10^{-03}	No
Bis(2-chloroisopropyl)ether	4.80×10^{-02}	6.99×10^{-01}	$6.87 \times 10^{+01}$	4.23×10^{-02}	No
Bis(2-ethylhexyl)phthalate	$1.10 \times 10^{+01}$	$1.08 \times 10^{+03}$	$1.02 \times 10^{+01}$	6.08×10^{-01}	No
Bromodichloromethane	6.00×10^{-03}	4.21×10^{-01}	$1.43 \times 10^{+01}$	1.37×10^{-01}	No
Bromomethane	7.20×10^{-01}	6.79×10^{-02}	$1.06 \times 10^{+04}$	$1.08 \times 10^{+00}$	No
Butyl benzyl phthalate	7.50×10^{-02}	$3.25 \times 10^{+01}$	$2.31 \times 10^{+00}$	$7.30 \times 10^{+02}$	Yes
Carbazole	5.70×10^{-01}	$1.05 \times 10^{+01}$	$5.42 \times 10^{+01}$	4.26×10^{-01}	No
Carbon disulfide	7.90×10^{-01}	7.82×10^{-01}	$1.01 \times 10^{+03}$	$2.76 \times 10^{+00}$	No
Chlorobenzene	1.00×10^{-02}	$3.73 \times 10^{+00}$	$2.68 \times 10^{+00}$	$5.16 \times 10^{+00}$	Yes
Chloroform	2.80×10^{-01}	5.03×10^{-01}	$5.56 \times 10^{+02}$	2.78×10^{-02}	No
Chrysene	$1.20 \times 10^{+01}$	$2.16 \times 10^{+03}$	$5.56 \times 10^{+00}$	2.00×10^{-01}	No
Di-n-butyl phthalate	$6.10 \times 10^{+00}$	$8.52 \times 10^{+02}$	$7.16 \times 10^{+00}$	$3.65 \times 10^{+02}$	Yes
Di-n-octyl phthalate	6.30×10^{-01}	$8.52 \times 10^{+06}$	7.39×10^{-05}	$7.30 \times 10^{+01}$	Yes
Dibenzo(a,h)anthracene	$3.50 \times 10^{+00}$	$5.03 \times 10^{+03}$	6.96×10^{-01}	1.05×10^{-03}	No
Dibenzofuran	$2.50 \times 10^{+00}$	$7.12 \times 10^{+01}$	$3.51 \times 10^{+01}$	$1.50 \times 10^{+01}$	No
Dieldrin	2.00×10^{-02}	$6.63 \times 10^{+01}$	3.01×10^{-01}	5.32×10^{-04}	No
Diethyl phthalate	5.20×10^{-02}	$1.59 \times 10^{+00}$	$3.27 \times 10^{+01}$	$2.92 \times 10^{+03}$	Yes
Endosulfan II	2.00×10^{-03}	$2.31 \times 10^{+01}$	8.66×10^{-02}	$2.19 \times 10^{+01}$	Yes
Endosulfan sulfate	7.30×10^{-04}	$2.53 \times 10^{+01}$	2.89×10^{-02}	$2.19 \times 10^{+01}$	Yes
Endrin	5.00×10^{-03}	$2.15 \times 10^{+03}$	2.33×10^{-03}	$1.10 \times 10^{+00}$	Yes
Endrin aldehyde	1.50×10^{-02}	$7.55 \times 10^{+00}$	$1.99 \times 10^{+00}$	$1.10 \times 10^{+00}$	No
Ethylbenzene	1.40×10^{-01}	$7.55 \times 10^{+00}$	$1.85 \times 10^{+01}$	$1.58 \times 10^{+02}$	Yes
Fluoranthene	$1.90 \times 10^{+01}$	$1.15 \times 10^{+03}$	$1.65 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
Fluorene	$1.70 \times 10^{+00}$	$8.09 \times 10^{+01}$	$2.10 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
Heptachlor epoxide	2.80×10^{-03}	$2.43 \times 10^{+00}$	$1.15 \times 10^{+00}$	1.97×10^{-04}	No

TABLE F.2.3-5 (Continued)

Constituents of Potential Concern	Maximum Soil Conc. (mg/kg)	Minimum K_l/K_d (L/kg)	Predicted Water Conc. (μg/L)	10^{-7} Risk or 0.1 HQ (μg/L)	Screened Out Yes/No
Heptachlorodibenzofurans	3.20×10^{-04}	$3.56 \times 10^{+03}$	8.98×10^{-05}	5.70×10^{-06}	No
Hexachlorobutadiene	4.30×10^{-01}	$3.25 \times 10^{+02}$	$1.32 \times 10^{+00}$	2.32×10^{-02}	No
Indeno(1,2,3-cd)pyrene	$8.70 \times 10^{+00}$	$2.46 \times 10^{+05}$	3.53×10^{-02}	4.26×10^{-03}	No
Isophorone	8.30×10^{-01}	2.78×10^{-01}	$2.99 \times 10^{+03}$	$8.96 \times 10^{+00}$	No
Methoxychlor	1.30×10^{-03}	$2.65 \times 10^{+02}$	4.91×10^{-03}	$1.83 \times 10^{+01}$	Yes
Methylene chloride	2.22×10^{-01}	9.60×10^{-02}	$2.31 \times 10^{+03}$	6.31×10^{-01}	No
N-nitroso-di-n-propylamine	3.90×10^{-02}	1.72×10^{-01}	$2.27 \times 10^{+02}$	1.21×10^{-03}	No
N-nitrosodiphenylamine	$1.30 \times 10^{+00}$	$7.28 \times 10^{+00}$	$1.79 \times 10^{+02}$	$1.74 \times 10^{+00}$	No
Naphthalene	$1.10 \times 10^{+00}$	$1.24 \times 10^{+01}$	$8.87 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
Octachlorodibenzo-p-dioxin	1.10×10^{-03}	$5.65 \times 10^{+04}$	1.95×10^{-05}	5.70×10^{-05}	Yes
Phenanthrene	$1.30 \times 10^{+01}$	$1.56 \times 10^{+02}$	$8.31 \times 10^{+01}$	$1.46 \times 10^{+02}$	Yes
Phenol	3.10×10^{-01}	1.55×10^{-01}	$2.00 \times 10^{+03}$	$2.19 \times 10^{+03}$	Yes
Pyrene	$1.50 \times 10^{+01}$	$8.14 \times 10^{+02}$	$1.84 \times 10^{+01}$	$1.10 \times 10^{+02}$	Yes
Styrene	2.80×10^{-02}	$4.81 \times 10^{+00}$	$5.83 \times 10^{+00}$	2.84×10^{-01}	No
Tetrachloroethene	$3.30 \times 10^{+00}$	$1.83 \times 10^{+00}$	$1.81 \times 10^{+03}$	$3.65 \times 10^{+01}$	No
Toluene	1.90×10^{-01}	$2.64 \times 10^{+00}$	$7.19 \times 10^{+01}$	$9.34 \times 10^{+01}$	Yes
Total Xylenes	$2.00 \times 10^{+00}$	$5.93 \times 10^{+00}$	$3.37 \times 10^{+02}$	$7.30 \times 10^{+03}$	Yes
Tributyl phosphate	$1.20 \times 10^{+00}$	$5.39 \times 10^{+01}$	$2.23 \times 10^{+01}$	$1.83 \times 10^{+01}$	No
Trichloroethene	$8.60 \times 10^{+01}$	$1.83 \times 10^{+00}$	$4.70 \times 10^{+04}$	2.54×10^{-01}	No
Inorganics					
Aluminum	$1.98 \times 10^{+04}$	$1.50 \times 10^{+03}$	$1.32 \times 10^{+04}$	$1.10 \times 10^{+04}$	No
Antimony	$3.81 \times 10^{+01}$	$2.50 \times 10^{+02}$	$1.52 \times 10^{+02}$	$1.46 \times 10^{+00}$	No
Arsenic	$3.25 \times 10^{+01}$	$2.00 \times 10^{+02}$	$1.63 \times 10^{+02}$	4.87×10^{-03}	No
Barium	$5.12 \times 10^{+02}$	$1.14 \times 10^{+03}$	$4.49 \times 10^{+02}$	$2.56 \times 10^{+02}$	No
Beryllium	$3.50 \times 10^{+00}$	$1.30 \times 10^{+03}$	$2.69 \times 10^{+00}$	1.98×10^{-03}	No
Boron	$1.43 \times 10^{+01}$	$3.00 \times 10^{+00}$	$4.77 \times 10^{+03}$	$3.29 \times 10^{+02}$	No
Cadmium	$7.60 \times 10^{+00}$	$5.00 \times 10^{+02}$	$1.52 \times 10^{+01}$	$1.83 \times 10^{+00}$	No
Chromium	$4.69 \times 10^{+01}$	$1.50 \times 10^{+03}$	$3.12 \times 10^{+01}$	$1.80 \times 10^{+01}$	No
Cobalt	$2.06 \times 10^{+01}$	$5.50 \times 10^{+02}$	$3.75 \times 10^{+01}$	$2.19 \times 10^{+02}$	Yes
Copper	$2.07 \times 10^{+02}$	$1.25 \times 10^{+02}$	$1.66 \times 10^{+03}$	$1.36 \times 10^{+02}$	No

TABLE F.2.3-5 (Continued)

Constituents of Potential Concern	Maximum Soil Conc. (mg/kg)	Minimum K_l/K_d (L/kg)	Predicted Water Conc. (μg/L)	10^{-7} Risk or 0.1 HQ (μg/L)	Screened Out Yes/No
Cyanide	$1.50 \times 10^{+00}$	1.21×10^{-02}	$1.24 \times 10^{+05}$	$7.30 \times 10^{+01}$	No
Lead	$2.16 \times 10^{+03}$	$3.00 \times 10^{+03}$	$7.20 \times 10^{+02}$	$1.50 \times 10^{+00}$	No
Magnesium	$4.86 \times 10^{+04}$	$4.50 \times 10^{+00}$	$1.08 \times 10^{+07}$	$3.54 \times 10^{+04}$	No
Manganese	$3.42 \times 10^{+03}$	$1.80 \times 10^{+02}$	$1.90 \times 10^{+04}$	$1.83 \times 10^{+01}$	No
Mercury	$2.10 \times 10^{+00}$	$1.00 \times 10^{+01}$	$2.10 \times 10^{+02}$	$1.10 \times 10^{+00}$	No
Molybdenum	$1.31 \times 10^{+01}$	$9.00 \times 10^{+01}$	$1.46 \times 10^{+02}$	$1.83 \times 10^{+01}$	No
Nickel	$7.22 \times 10^{+01}$	$6.50 \times 10^{+02}$	$1.11 \times 10^{+02}$	$7.30 \times 10^{+01}$	No
Selenium	$3.70 \times 10^{+00}$	$7.40 \times 10^{+02}$	$5.00 \times 10^{+00}$	$1.83 \times 10^{+01}$	Yes
Silver	$1.72 \times 10^{+01}$	$1.80 \times 10^{+02}$	$9.56 \times 10^{+01}$	$1.83 \times 10^{+01}$	No
Thallium	7.70×10^{-01}	$1.50 \times 10^{+03}$	5.13×10^{-01}	2.56×10^{-01}	No
Vanadium	$3.88 \times 10^{+01}$	$1.00 \times 10^{+03}$	$3.88 \times 10^{+01}$	$2.56 \times 10^{+01}$	No
Zinc	$2.15 \times 10^{+03}$	$2.40 \times 10^{+03}$	$8.96 \times 10^{+02}$	$1.10 \times 10^{+03}$	Yes

TABLE F.2.3-6

CONSTITUENTS OF POTENTIAL CONCERN SCREENING RESULTS IN THE SURFACE WATER PATHWAY BASELINE CONDITION

Constituents of Concern	Surface Water Impact	Groundwater Impact	Major Source Areas
Radionuclides			
Neptunium-237	X	X	North of the production area, around Pilot Plant drainage ditch
Plutonium-238	X		East of production area, around Pilot Plant drainage ditch
Radium-226	X	X	North of the production area, around Pilot Plant drainage ditch
Strontium-90	X	X	North of the production area, east of production area
Technetium-99	X	X	Area around South Field, around Pilot Plant drainage ditch
Uranium-Total	X	X	East of production area, around Pilot Plant drainage ditch
Organics			
1,1-Dichloroethene	X	X	East of production area
3,3'-Dichlorobenzidine	X		North of the production area
4-Methylphenol	X	X	Around active flyash pile, area around South Field
4-Nitroaniline	X		North of the production area
Aroclor-1254	X		North of the production area, east of production area
Benzene	X		North of the production area
Benzo(a)anthracene	X		North of the production area, around Pilot Plant drainage ditch
Benzo(a)pyrene	X		North of the production area, east of production area
Bis(2-chloroisopropyl)ether	X	X	Around Pilot Plant drainage ditch
Bromodichloromethane	X		Area around South Field
Chloroform	X	X	Area around South Field
Dibenzo(a,h)anthracene	X		North of the production area, east of production area
Dieldrin	X	X	North of the production area
Methylene chloride	X	X	North of the production area, around Pilot Plant drainage ditch
N-nitroso-di-n-propylamine	X	X	North of the production area

TABLE F.2.3-6 (Continued)

Constituents of Concern	Surface Water Impact	Groundwater Impact	Major Source Areas
Inorganics			
Arsenic	X	X	Around Pilot Plant drainage ditch, north of the production area
Beryllium	X	X	Around Pilot Plant drainage ditch, east of production area
Cyanide	X	X	East of production area, north of the production area
Lead	X	X	East of production area, north of the production area
Magnesium	X	X	East of production area, north of the production area
Manganese	X	X	East of production area, area around South Field
Mercury	X	X	East of production area, around active flyash pile

TABLE F.2.3-7

CONSTITUENTS OF POTENTIAL CONCERN SCREENING RESULTS IN THE SURFACE WATER PATHWAY FUTURE CONDITION

Constituents of Concern	Surface Water Impact	Groundwater Impact	Major Source Areas
Radionuclides			
Neptunium-237	X	X	North of the production area, Production area
Plutonium-238	X	X	Production area, east of production area
Plutonium-239/240	X		Production area, east of production area
Radium-226	X	X	Production area, north of the production area
Strontium-90	X	X	Production area, north of the production area
Technetium-99	X	X	Area around South Field, production area
Thorium-230	X	X	Production area, around Pilot Plant drainage ditch
Thorium-232	X	X	Production area, around Pilot Plant drainage ditch
Uranium-Total	X	X	Production area, east of production area
Organics			
4-Methylphenol	X	X	Around active flyash pile, area around South Field
4-Nitroaniline	X		North of the production area
Alpha-Chlordane	X		Production area
Aroclor-1254	X	X	Production area, north of the production area
Aroclor-1260	X	X	Production area, north of the production area
Bis(2-chloroisopropyl)ether	X	X	Around Pilot Plant drainage ditch, production area
Bromodichloromethane	X		Area around South Field
Bromomethane	X	X	Production area

TABLE F.2.3-7 (Continued)

Constituents of Concern	Surface Water Impact	Groundwater Impact	Major Source Areas
Inorganics			
Antimony	X		Waste pit area, around Pilot Plant drainage ditch
Arsenic	X	X	Around Pilot Plant drainage ditch, north of the production area
Beryllium	X	X	Production area, around active flyash pile
Cyanide	X	X	East of production area, production area
Lead	X	X	East of production area, production area
Magnesium	X	X	East of production area, north of the production area
Manganese	X	X	East of production area, area around South Field
Mercury	X	X	Production area, east of production area

TABLE F.2.4-1

SUMMARY OF PREDICTED CONCENTRATIONS OF CONSTITUENTS OF POTENTIAL CONCERN IN SEDIMENT BASELINE CONDITION

Constituents of Potential Concern	Maximum Concentration (mg/kg)	Major Impacted Area
Radionuclides		
Neptunium-237	9.07×10^{-04}	North side drainage ditch
Plutonium-238	1.02×10^{-07}	East side drainage ditch
Radium-226	3.87×10^{-05}	North side drainage ditch
Strontium-90	1.45×10^{-08}	North side drainage ditch
Technetium-99	6.03×10^{-04}	Paddys Run near South Field
Uranium-Total	$5.52 \times 10^{+02}$	Pilot Plant drainage ditch
Organics		
1,1-Dichloroethene	2.20×10^{-03}	East side drainage ditch
3,3'-Dichlorobenzidine	3.33×10^{-02}	North side drainage ditch
4-Methylphenol	$1.23 \times 10^{+00}$	Lower SSOD
4-Nitroaniline	2.77×10^{-02}	North side drainage ditch
Aroclor-1254	3.72×10^{-01}	North side drainage ditch
Benzene	1.98×10^{-03}	North side drainage ditch
Benzo(a)anthracene	$1.70 \times 10^{+00}$	North side drainage ditch
Benzo(a)pyrene	$2.14 \times 10^{+00}$	North side drainage ditch
Bis(2-chloroisopropyl)ether	1.76×10^{-02}	Pilot Plant drainage ditch
Bromodichloromethane	3.39×10^{-03}	Paddys Run near South Field
Chloroform	1.90×10^{-02}	Paddys Run near South Field
Dibenzo(a,h)anthracene	6.19×10^{-01}	North side drainage ditch
Dieldrin	1.58×10^{-02}	North side drainage ditch
Methylene chloride	1.32×10^{-01}	North side drainage ditch
N-Nitroso-di-n-propylamine	3.68×10^{-03}	North side drainage ditch

TABLE F.2.4-1
(Continued)

Constituents of Potential Concern	Maximum Concentration (mg/kg)	Major Impacted Area
Inorganics		
Arsenic	$2.40 \times 10^{+01}$	Pilot Plant drainage ditch
Beryllium	$1.58 \times 10^{+00}$	Pilot Plant drainage ditch
Cyanide	9.21×10^{-02}	Lower SSOD
Lead	$1.65 \times 10^{+03}$	East side drainage ditch
Magnesium	$3.15 \times 10^{+04}$	East side drainage ditch
Manganese	$2.88 \times 10^{+03}$	East side drainage ditch
Mercury	4.45×10^{-01}	East side drainage ditch

TABLE F.2.4-2

SUMMARY OF PREDICTED CONCENTRATIONS OF CONSTITUENTS OF POTENTIAL CONCERN IN SURFACE WATER BASELINE CONDITION

Constituents of Potential Concern	Maximum Paddys Run Concentration (mg/L)	Great Miami River Concentration at Discharge Outfall Yearly Average (mg\L)	Great Miami River Concentration at Discharge Outfall Maximum Week (mg\L)	Maximum Great Miami River Concentration at Paddys Run (mg\L)
Radionuclides				
Neptunium-237	2.61×10^{-07}	1.72×10^{-10}	7.94×10^{-10}	2.17×10^{-08}
Plutonium-238	9.38×10^{-13}	1.95×10^{-14}	2.54×10^{-13}	7.78×10^{-14}
Radium-226	3.84×10^{-10}	9.53×10^{-12}	1.01×10^{-10}	3.18×10^{-11}
Strontium-90	3.36×10^{-11}	2.08×10^{-14}	7.15×10^{-14}	2.79×10^{-12}
Technetium-99	6.03×10^{-05}	5.40×10^{-08}	1.70×10^{-07}	5.00×10^{-06}
Uranium-Total	1.02×10^{-01}	7.47×10^{-04}	5.87×10^{-03}	8.46×10^{-03}
Organics				
1,1-Dichloroethene	1.47×10^{-04}	2.32×10^{-07}	7.32×10^{-07}	1.22×10^{-05}
3,3'-Dichlorobenzidine	1.27×10^{-05}	0.00	0.00	1.05×10^{-06}
4-Methylphenol	2.67×10^{-02}	1.58×10^{-07}	5.00×10^{-07}	2.21×10^{-03}
4-Nitroaniline	1.39×10^{-03}	0.00	0.00	1.16×10^{-04}
Aroclor-1254	4.98×10^{-07}	5.84×10^{-08}	8.60×10^{-07}	4.13×10^{-08}
Benzene	1.79×10^{-05}	6.48×10^{-09}	2.05×10^{-08}	1.48×10^{-06}
Benzo(a)anthracene	5.23×10^{-06}	4.01×10^{-08}	5.41×10^{-07}	4.34×10^{-07}
Benzo(a)pyrene	2.77×10^{-06}	4.22×10^{-08}	6.16×10^{-07}	2.29×10^{-07}
Bis(2-Chloroisopropyl)ether	7.64×10^{-04}	1.06×10^{-07}	3.36×10^{-07}	6.33×10^{-05}
Bromodichloromethane	6.96×10^{-05}	0.00	0.00	5.77×10^{-06}
Chloroform	3.18×10^{-04}	6.85×10^{-08}	2.17×10^{-07}	2.63×10^{-05}
Dibenzo(a,h)anthracene	8.19×10^{-07}	1.23×10^{-08}	1.82×10^{-07}	6.79×10^{-08}
Dieldrin	1.56×10^{-06}	6.93×10^{-10}	3.46×10^{-09}	1.30×10^{-07}

TABLE F.2.4-2
(Continued)

Constituents of Potential Concern	Maximum Paddys Run Concentration (mg/L)	Great Miami River Concentration at Discharge Outfall Yearly Average (mg\L)	Great Miami River Concentration at Discharge Outfall Maximum Week (mg\L)	Maximum Great Miami River Concentration at Paddys Run (mg\L)
Organics (Continued)				
Methylene Chloride	9.15×10^{-03}	9.33×10^{-07}	2.94×10^{-06}	7.59×10^{-04}
N-Nitroso-di-n-propylamine	1.46×10^{-04}	0.00	0.00	1.21×10^{-05}
Inorganics				
Arsenic	3.80×10^{-03}	1.07×10^{-06}	7.28×10^{-06}	3.15×10^{-04}
Beryllium	3.80×10^{-05}	7.10×10^{-08}	7.69×10^{-07}	3.15×10^{-06}
Cyanide	1.16×10^{-01}	4.79×10^{-05}	1.51×10^{-04}	9.61×10^{-03}
Lead	6.36×10^{-03}	3.29×10^{-06}	4.16×10^{-05}	5.27×10^{-04}
Magnesium	$1.69 \times 10^{+02}$	7.74×10^{-02}	2.54×10^{-01}	$1.40 \times 10^{+01}$
Manganese	2.64×10^{-01}	1.21×10^{-04}	7.92×10^{-04}	2.19×10^{-02}
Mercury	1.13×10^{-03}	6.55×10^{-07}	2.25×10^{-06}	9.37×10^{-05}

TABLE F.2.4-3

SUMMARY OF PREDICTED CONCENTRATIONS OF CONSTITUENTS OF POTENTIAL CONCERN IN THE GREAT MIAMI AQUIFER ALONG PADDYS RUN BASELINE CONDITION

Constituents of Potential Concern	Section C-D[a] (μg/L)	Section D-E[a] (μg/L)	Section E-F[a] (μg/L)	Storm Sewer Outfall Ditch (μg/L)
Radionuclides				
Neptunium-237	7.69×10^{-05}	3.61×10^{-05}	4.88×10^{-06}	0.00
Plutonium-238	7.74×10^{-11}	4.03×10^{-11}	5.44×10^{-11}	9.45×10^{-10}
Radium-226	1.73×10^{-07}	7.83×10^{-08}	1.30×10^{-08}	7.80×10^{-08}
Strontium-90	7.23×10^{-09}	4.01×10^{-09}	2.09×10^{-09}	3.11×10^{-08}
Technetium-99	7.88×10^{-03}	1.21×10^{-02}	2.37×10^{-03}	1.94×10^{-02}
Uranium-Total	$1.29 \times 10^{+01}$	$6.59 \times 10^{+00}$	$5.89 \times 10^{+00}$	$9.69 \times 10^{+01}$
Organics				
1,1-Dichloroethene	0.00	0.00	1.04×10^{-02}	2.07×10^{-01}
3,3'-Dichlorobenzidine	5.13×10^{-03}	2.22×10^{-03}	2.42×10^{-04}	0.00
4-Methylphenol	3.57×10^{-03}	3.83×10^{-01}	$1.87 \times 10^{+00}$	$3.63 \times 10^{+01}$
4-Nitroaniline	5.63×10^{-01}	2.44×10^{-01}	2.65×10^{-02}	0.00
Aroclor-1254	2.13×10^{-04}	9.59×10^{-05}	3.40×10^{-05}	4.44×10^{-04}
Benzene	7.23×10^{-03}	3.13×10^{-03}	3.40×10^{-04}	0.00
Benzo(a)anthracene	2.41×10^{-03}	1.10×10^{-03}	1.74×10^{-04}	9.13×10^{-04}
Benzo(a)pyrene	1.22×10^{-03}	5.50×10^{-04}	9.32×10^{-05}	6.08×10^{-04}
Bis(2-chloroisopropyl)ether	9.14×10^{-02}	4.79×10^{-02}	8.04×10^{-03}	0.00
Bromodichloromethane	0.00	1.25×10^{-02}	1.15×10^{-03}	0.00
Chloroform	0.00	5.69×10^{-02}	5.24×10^{-03}	0.00
Dibenzo(a,h)anthracene	3.39×10^{-04}	1.48×10^{-04}	2.96×10^{-05}	2.63×10^{-04}
Dieldrin	6.32×10^{-04}	2.74×10^{-04}	2.98×10^{-05}	0.00
Methylene chloride	$3.94 \times 10^{+00}$	$1.73 \times 10^{+00}$	2.18×10^{-01}	4.41×10^{-01}
N-Nitroso-di-n-propylamine	5.91×10^{-02}	2.56×10^{-02}	2.78×10^{-03}	0.00

TABLE F.2.4-3
(Continued)

Constituents of Potential Concern	Section C-D[a] (μg/L)	Section D-E[a] (μg/L)	Section E-F[a] (μg/L)	Storm Sewer Outfall Ditch (μg/L)
Inorganics				
Arsenic	6.11×10^{-01}	3.60×10^{-01}	1.16×10^{-01}	$1.27 \times 10^{+00}$
Beryllium	7.66×10^{-03}	5.49×10^{-03}	2.21×10^{-03}	2.97×10^{-02}
Cyanide	$1.79 \times 10^{+01}$	$1.20 \times 10^{+01}$	$7.34 \times 10^{+00}$	$1.15 \times 10^{+02}$
Lead	8.52×10^{-02}	5.13×10^{-02}	4.49×10^{-01}	$8.78 \times 10^{+00}$
Magnesium	$3.41 \times 10^{+04}$	$2.41 \times 10^{+04}$	$1.10 \times 10^{+04}$	$1.60 \times 10^{+05}$
Manganese	$2.79 \times 10^{+01}$	$2.44 \times 10^{+01}$	$1.79 \times 10^{+01}$	$2.98 \times 10^{+02}$
Mercury	1.77×10^{-01}	1.32×10^{-01}	7.26×10^{-02}	$1.11 \times 10^{+00}$

[a]See Figure F.2.2-6

TABLE F.2.4-4

SUMMARY OF PREDICTED LOADING OF CONCENTRATIONS OF POTENTIAL CONCERN THROUGH PADDYS RUN AND THE STORM SEWER OUTFALL DITCH INTO THE GREAT MIAMI AQUIFER BASELINE CONDITION

Constituents of Potential Concern	Section C-D[a] (kg/yr)	Section D-E[a] (kg/yr)	Section E-F[a] (kg/yr)	Storm Sewer Outfall Ditch (kg/yr)
Radionuclides				
Neptunium-237	9.96×10^{-05}	3.75×10^{-05}	4.00×10^{-06}	0.00
Plutonium-238	4.39×10^{-11}	1.90×10^{-11}	1.48×10^{-11}	4.44×10^{-10}
Radium-226	2.91×10^{-07}	1.09×10^{-07}	1.15×10^{-08}	4.20×10^{-08}
Strontium-90	8.98×10^{-09}	4.04×10^{-09}	8.84×10^{-10}	1.75×10^{-08}
Technetium-99	5.42×10^{-03}	1.11×10^{-02}	1.26×10^{-03}	9.10×10^{-03}
Uranium-Total	$1.14 \times 10^{+01}$	$4.69 \times 10^{+00}$	$1.80 \times 10^{+00}$	$4.58 \times 10^{+01}$
Organics				
1,1-Dichloroethene	0.00	0.00	2.57×10^{-03}	9.71×10^{-02}
3,3'-Dichlorobenzidine	9.30×10^{-03}	3.39×10^{-03}	3.16×10^{-04}	0.00
4-Methylphenol	6.47×10^{-03}	4.19×10^{-01}	7.42×10^{-01}	$2.67 \times 10^{+01}$
4-Nitroaniline	$1.02 \times 10^{+00}$	3.72×10^{-01}	3.47×10^{-02}	0.00
Aroclor-1254	3.35×10^{-04}	1.23×10^{-04}	1.77×10^{-05}	2.09×10^{-04}
Benzene	1.31×10^{-02}	4.77×10^{-03}	4.45×10^{-04}	0.00
Benzo(a)anthracene	3.99×10^{-03}	1.50×10^{-03}	1.56×10^{-04}	4.31×10^{-04}
Benzo(a)pyrene	2.08×10^{-03}	7.76×10^{-04}	8.14×10^{-05}	2.87×10^{-04}
Bis(2-chloroisopropyl)ether	4.77×10^{-02}	2.10×10^{-02}	3.44×10^{-03}	0.00
Bromodichloromethane	0.00	1.36×10^{-02}	1.08×10^{-03}	0.00
Chloroform	0.00	6.20×10^{-02}	4.91×10^{-03}	0.00
Dibenzo(a,h)anthracene	6.04×10^{-04}	2.20×10^{-04}	2.40×10^{-05}	1.24×10^{-04}
Dieldrin	1.15×10^{-03}	4.17×10^{-04}	3.90×10^{-05}	0.00
Methylene Chloride	$6.84 \times 10^{+00}$	$2.50 \times 10^{+00}$	2.43×10^{-01}	2.07×10^{-01}
N-Nitroso-di-n-propylamine	1.07×10^{-01}	3.90×10^{-02}	3.64×10^{-03}	0.00

TABLE F.2.4-4
(Continued)

Constituents of Potential Concern	Section C-D[a] (kg/yr)	Section D-E[a] (kg/yr)	Section E-F[a] (kg/yr)	Storm Sewer Outfall Ditch (kg/yr)
Inorganics				
Arsenic	5.23×10^{-01}	2.67×10^{-01}	5.12×10^{-02}	7.45×10^{-01}
Beryllium	8.06×10^{-03}	5.03×10^{-03}	9.82×10^{-04}	1.76×10^{-02}
Cyanide	$2.02 \times 10^{+01}$	$1.14 \times 10^{+01}$	$2.83 \times 10^{+00}$	$6.26 \times 10^{+01}$
Lead	1.14×10^{-01}	5.53×10^{-02}	1.16×10^{-01}	$4.15 \times 10^{+00}$
Magnesium	$4.20 \times 10^{+04}$	$2.46 \times 10^{+04}$	$4.75 \times 10^{+03}$	$8.80 \times 10^{+04}$
Manganese	$3.16 \times 10^{+01}$	$2.41 \times 10^{+01}$	$6.33 \times 10^{+00}$	$1.51 \times 10^{+02}$
Mercury	1.99×10^{-01}	1.27×10^{-01}	2.92×10^{-02}	6.22×10^{-01}

[a]See Figure F.2.2-6.

TABLE F.2.4-5

SUMMARY OF PREDICTED CONCENTRATIONS OF CONSTITUENTS OF POTENTIAL CONCERN IN SEDIMENT FUTURE CONDITION

Constituents of Potential Concern	Maximum Concentration (mg/kg)	Major Impacted Area
Radionuclides		
Neptunium-237	9.07×10^{-04}	North side drainage ditch
Plutonium-238	3.42×10^{-07}	SSOD
Plutonium-239/240	2.80×10^{-05}	SSOD
Radium-226	2.10×10^{-04}	SSOD
Strontium-90	3.15×10^{-09}	SSOD
Technetium-99	6.03×10^{-04}	Paddys Run near South Field
Thorium-230	1.47×10^{-02}	SSOD
Thorium-232	$1.92 \times 10^{+02}$	SSOD
Uranium-Total	$3.38 \times 10^{+03}$	SSOD
Organics		
4-Methylphenol	$1.23 \times 10^{+00}$	Lower SSOD
4-Nitroaniline	2.77×10^{-02}	North side drainage ditch
Alpha-Chlordane	7.41×10^{-04}	SSOD
Aroclor-1254	$2.09 \times 10^{+00}$	SSOD
Aroclor-1260	8.24×10^{-01}	SSOD
Bis(2-chloroisopropyl)ether	1.76×10^{-02}	Pilot Plant drainage ditch
Bromodichloromethane	3.39×10^{-03}	Paddys Run near South Field
Bromomethane	1.72×10^{-02}	SSOD

TABLE F.2.4-5
(Continued)

Constituents of Potential Concern	Maximum Concentration (mg/kg)	Major Impacted Area
Inorganics		
Antimony	$1.35 \times 10^{+01}$	Paddys Run near waste pit area
Arsenic	$2.43 \times 10^{+01}$	Pilot Plant drainage ditch
Beryllium	$1.58 \times 10^{+00}$	Pilot Plant drainage ditch
Cyanide	6.36×10^{-02}	East side drainage ditch
Lead	$1.65 \times 10^{+03}$	East side drainage ditch
Magnesium	$3.15 \times 10^{+04}$	East side drainage ditch
Manganese	$2.88 \times 10^{+03}$	East side drainage ditch
Mercury	5.34×10^{-01}	SSOD

TABLE F.2.4-6

SUMMARY OF PREDICTED CONCENTRATIONS OF CONSTITUENTS OF POTENTIAL CONCERN IN SURFACE WATER FUTURE CONDITION

Constituents of Potential Concern	Maximum Paddys Run Concentration (mg/L)	Maximum Great Miami River Concentration (mg/L)
Radionuclides		
Neptunium-237	2.81×10^{-07}	2.46×10^{-08}
Plutonium-238	3.49×10^{-12}	3.06×10^{-13}
Plutonium-239/240	3.68×10^{-10}	3.23×10^{-11}
Radium-226	4.75×10^{-09}	4.17×10^{-10}
Strontium-90	8.73×10^{-12}	7.66×10^{-13}
Technetium-99	8.70×10^{-05}	7.63×10^{-06}
Thorium-230	4.12×10^{-08}	3.61×10^{-09}
Thorium-232	5.80×10^{-04}	5.08×10^{-05}
Uranium-Total	$1.98 \times 10^{+00}$	1.74×10^{-01}
Organics		
4-Methylphenol	2.42×10^{-02}	2.12×10^{-03}
4-Nitroaniline	1.39×10^{-03}	1.22×10^{-04}
Alpha-Chlordane	3.45×10^{-06}	3.02×10^{-07}
Aroclor-1254	5.79×10^{-06}	5.08×10^{-07}
Aroclor-1260	1.79×10^{-06}	1.57×10^{-07}
Bis(2-chloroisopropyl)ether	4.92×10^{-04}	4.32×10^{-05}
Bromodichloromethane	5.59×10^{-05}	4.90×10^{-06}
Bromomethane	3.84×10^{-03}	3.37×10^{-04}

TABLE F.2.4-6
(Continued)

Constituents of Potential Concern	Maximum Paddys Run Concentration (mg/L)	Maximum Great Miami River Concentration (mg/L)
Inorganics		
Antimony	1.50×10^{-03}	1.31×10^{-04}
Arsenic	2.85×10^{-03}	2.50×10^{-04}
Beryllium	3.77×10^{-05}	3.30×10^{-06}
Cyanide	1.38×10^{-01}	1.21×10^{-02}
Lead	6.27×10^{-03}	5.50×10^{-04}
Magnesium	$2.07 \times 10^{+02}$	$1.82 \times 10^{+01}$
Manganese	2.84×10^{-01}	2.49×10^{-02}
Mercury	1.58×10^{-03}	1.38×10^{-04}

TABLE F.2.4-7

SUMMARY OF PREDICTED CONCENTRATIONS OF CONSTITUENTS OF POTENTIAL CONCERN IN THE GREAT MIAMI AQUIFER ALONG PADDYS RUN FUTURE CONDITION

Constituents of Potential Concern	Section C-D[a] (μg/L)	Section D-E[a] (μg/L)	Section E-F[a] (μg/L)	Storm Sewer Outfall Ditch (μg/L)
Radionuclides				
Neptunium-237	9.17×10^{-05}	4.60×10^{-05}	1.53×10^{-05}	1.55×10^{-04}
Plutonium-238	5.44×10^{-11}	2.98×10^{-11}	1.96×10^{-10}	3.10×10^{-09}
Plutonium-239/240	8.91×10^{-09}	4.81×10^{-09}	2.09×10^{-08}	3.27×10^{-07}
Radium-226	2.10×10^{-07}	1.02×10^{-07}	2.73×10^{-07}	4.23×10^{-06}
Strontium-90	1.44×10^{-09}	8.22×10^{-10}	5.76×10^{-10}	7.72×10^{-09}
Technetium-99	8.45×10^{-03}	1.23×10^{-02}	6.06×10^{-03}	7.67×10^{-02}
Thorium-230	1.87×10^{-06}	1.13×10^{-06}	2.41×10^{-06}	3.65×10^{-05}
Thorium-232	3.88×10^{-02}	2.28×10^{-02}	3.48×10^{-02}	5.13×10^{-01}
Uranium-Total	$1.36 \times 10^{+01}$	$7.30 \times 10^{+00}$	$1.10 \times 10^{+02}$	$1.76 \times 10^{+03}$
Organics				
4-Methylphenol	3.34×10^{-03}	3.69×10^{-01}	$1.36 \times 10^{+00}$	$2.16 \times 10^{+01}$
4-Nitroaniline	5.27×10^{-01}	2.35×10^{-01}	2.24×10^{-02}	0.00
Alpha-Chlordane	0.00	0.00	1.90×10^{-04}	3.07×10^{-03}
Aroclor-1254	2.18×10^{-04}	1.03×10^{-04}	3.30×10^{-04}	5.15×10^{-03}
Aroclor-1260	5.85×10^{-06}	2.61×10^{-06}	9.88×10^{-05}	1.60×10^{-03}
Bis(2-chloroisopropyl)ether	8.54×10^{-02}	4.70×10^{-02}	1.50×10^{-02}	1.31×10^{-01}
Bromodichloromethane	0.00	1.20×10^{-02}	1.03×10^{-03}	0.00
Bromomethane	0.00	0.00	2.12×10^{-01}	$3.42 \times 10^{+00}$
Inorganics				
Antimony	3.35×10^{-01}	1.81×10^{-01}	6.02×10^{-02}	5.76×10^{-01}
Arsenic	6.41×10^{-01}	3.89×10^{-01}	1.40×10^{-01}	$1.44 \times 10^{+00}$
Beryllium	8.32×10^{-03}	5.97×10^{-03}	2.75×10^{-03}	3.31×10^{-02}
Cyanide	$2.12 \times 10^{+01}$	$1.41 \times 10^{+01}$	$9.23 \times 10^{+00}$	$1.22 \times 10^{+02}$
Lead	9.64×10^{-02}	5.89×10^{-02}	3.52×10^{-01}	$5.58 \times 10^{+00}$
Magnesium	$3.70 \times 10^{+04}$	$2.61 \times 10^{+04}$	$1.43 \times 10^{+04}$	$1.83 \times 10^{+05}$
Manganese	$3.66 \times 10^{+01}$	$2.94 \times 10^{+01}$	$1.89 \times 10^{+01}$	$2.51 \times 10^{+02}$
Mercury	2.08×10^{-01}	1.52×10^{-01}	1.04×10^{-01}	$1.39 \times 10^{+00}$

[a]See Figure F.2.2-6.

TABLE F.2.4-8

SUMMARY OF PREDICTED LOADING OF CONCENTRATIONS OF POTENTIAL CONCERN THROUGH PADDYS RUN AND THE STORM SEWER OUTFALL DITCH INTO THE GREAT MIAMI AQUIFER FUTURE CONDITION

Constituents of Potential Concern	Section C-D[a] (kg/yr)	Section D-E[a] (kg/yr)	Section E-F[a] (kg/yr)	Storm Sewer Outfall Ditch (kg/yr)
Radionuclides				
Neptunium-237	1.11×10^{-04}	4.27×10^{-05}	6.90×10^{-06}	1.23×10^{-04}
Plutonium-238	3.24×10^{-11}	1.43×10^{-11}	5.72×10^{-11}	2.47×10^{-09}
Plutonium-239/240	6.23×10^{-09}	2.64×10^{-09}	6.58×10^{-09}	2.80×10^{-07}
Radium-226	3.12×10^{-07}	1.19×10^{-07}	8.59×10^{-08}	3.37×10^{-06}
Strontium-90	1.76×10^{-09}	7.95×10^{-10}	2.23×10^{-10}	6.68×10^{-09}
Technetium-99	6.03×10^{-03}	1.14×10^{-02}	2.32×10^{-03}	6.11×10^{-02}
Thorium-230	1.55×10^{-06}	7.98×10^{-07}	7.37×10^{-07}	2.92×10^{-05}
Thorium-232	2.92×10^{-02}	1.45×10^{-02}	1.09×10^{-02}	4.15×10^{-01}
Uranium-Total	$1.23 \times 10^{+01}$	$5.13 \times 10^{+00}$	$3.20 \times 10^{+01}$	$1.40 \times 10^{+03}$
Organics				
4-Methylphenol	6.49×10^{-03}	4.21×10^{-01}	6.32×10^{-01}	$2.69 \times 10^{+01}$
4-Nitroaniline	$1.03 \times 10^{+00}$	3.73×10^{-01}	2.99×10^{-02}	0.00
Alpha-Chlordane	0.00	0.00	5.46×10^{-05}	2.44×10^{-03}
Aroclor-1254	3.46×10^{-04}	1.29×10^{-04}	1.03×10^{-04}	4.10×10^{-03}
Aroclor-1260	1.14×10^{-05}	4.15×10^{-06}	2.87×10^{-05}	1.27×10^{-03}
Bis(2-chloroisopropyl)ether	4.77×10^{-02}	2.14×10^{-02}	5.33×10^{-03}	1.04×10^{-01}
Bromodichloromethane	0.00	1.37×10^{-02}	9.84×10^{-04}	0.00
Bromomethane	0.00	0.00	6.09×10^{-02}	$2.72 \times 10^{+00}$
Inorganics				
Antimony	2.91×10^{-01}	1.23×10^{-01}	2.43×10^{-02}	4.69×10^{-01}
Arsenic	5.63×10^{-01}	2.87×10^{-01}	5.91×10^{-02}	$1.30 \times 10^{+00}$
Beryllium	8.72×10^{-03}	5.36×10^{-03}	1.17×10^{-03}	3.00×10^{-02}
Cyanide	$2.27 \times 10^{+01}$	$1.26 \times 10^{+01}$	$3.55 \times 10^{+00}$	$1.06 \times 10^{+02}$
Lead	1.24×10^{-01}	5.98×10^{-02}	1.06×10^{-01}	$4.48 \times 10^{+00}$
Magnesium	$4.50 \times 10^{+04}$	$2.60 \times 10^{+04}$	$5.85 \times 10^{+03}$	$1.59 \times 10^{+05}$
Manganese	$3.75 \times 10^{+01}$	$2.69 \times 10^{+01}$	$7.16 \times 10^{+00}$	$2.12 \times 10^{+02}$
Mercury	2.23×10^{-01}	1.39×10^{-01}	3.97×10^{-02}	$1.21 \times 10^{+00}$

[a]See Figure F.2.2-6.

TABLE F.2.4-9

SURFACE WATER MODELING RESULTS FOR THE NORTHEAST DRAINAGE DITCH

Chemical	Baseline Surface Water Concentration (mg/L)	Baseline Sediment Concentration (mg/kg)	Future Surface Water Concentration (mg/L)	Future Sediment Concentration (mg/kg)
Concentration at the Surface Water Sampling Location (SWS-13)				
Arsenic	9.85×10^{-04}	$5.65 \times 10^{+00}$	9.85×10^{-04}	$5.65 \times 10^{+00}$
Beryllium	1.70×10^{-05}	6.35×10^{-01}	1.70×10^{-05}	6.35×10^{-01}
Manganese	1.70×10^{-01}	$8.76 \times 10^{+02}$	1.70×10^{-01}	$8.76 \times 10^{+02}$
Strontium-90	2.95×10^{-12}	4.62×10^{-09}	2.92×10^{-12}	8.36×10^{-10}
Uranium - Total	1.10×10^{-03}	$7.02 \times 10^{+00}$	1.10×10^{-03}	$7.02 \times 10^{+00}$
Concentration at the FEMP Fenceline				
Arsenic	1.06×10^{-03}	$6.10 \times 10^{+00}$	1.06×10^{-03}	1.06×10^{-03}
Beryllium	2.13×10^{-05}	8.00×10^{-01}	2.13×10^{-05}	8.00×10^{-01}
Manganese	2.25×10^{-01}	$1.17 \times 10^{+03}$	2.25×10^{-01}	$1.17 \times 10^{+03}$
Strontium-90	1.66×10^{-11}	2.62×10^{-08}	1.64×10^{-11}	4.75×10^{-09}
Uranium - Total	3.86×10^{-03}	$2.47 \times 10^{+01}$	3.86×10^{-03}	$2.47 \times 10^{+01}$

TABLE F.2.5-1

COMPARISON OF MODELED AND SAMPLED TOTAL URANIUM CONCENTRATIONS IN SURFACE WATERS

Surface Water Body	Modeling Drainage Subbasin Designation	Range of Positive Sampling Results[a] (μg/L)	Model Results (μg/L)
Ditch north of production area	560	42 - 92	14.2 - 60.4[b]
Ditch east of production area	581	39.7 - 555	43.9 - 143.2[c]
Manhole 175	PDAR	750 - 788	633 - 914[d]
Waste pit area	WPA	465 - 8148	1180
Pilot plant drainage ditch	570	74.2 - 2360	23.5
SSOD	SSOD	14 - 44	23.7[e]
Paddys Run On Site	Paddys Run	8.2 - 34.2	23.5[e]
GMR	GMR at Paddys Run	2.0 - 5.0	1.95[e]
Northeast ditch	NE	8 - 13.6[f]	1.10

[a]Unless indicated otherwise, reported sample results are for validated, filtered, and positive results.
[b]The sample data in this area was not taken at the subbasin outlet. The first number represents the concentration from the entire subbasin. The second represents a concentration based on source areas 560b, 560c, 560d, and SWL, which more closely matches the flow to the sampled location.
[c]See Footnote b; except second concentration is based on source areas 581b, 582c, and 581d.
[d]The first concentration results from source terms calculated without samples under buildings; the second is with samples under buildings.
[e]Modeled results are maximums for the case with stormwater controls in place.
[f]Sampled results are for unfiltered samples since only one filtered sample was analyzed.

TABLE F.2.5-2

COMPARISON OF MODELED AND SAMPLED TOTAL URANIUM CONCENTRATIONS IN SEDIMENTS

Surface Water Body	Modeling Drainage Subbasin Designation	Positive Range of Sampling Results[a] (mg/kg)	Model Results (mg/kg)
Ditch north of production area	560	14.7 - 30.9	44.3 - 162[b]
Ditch east of production area	581	105 - 230	76 - 217[c]
Production area	PDAR	595 - 614	373 - 558[d]
Waste pit area	WPA	20 - 135	464
Pilot plant drainage ditch	570	30.3	162
SSOD	SSOD	4 - 22.9	44.5[e]
Paddys Run On Site	Paddys Run	1.2 - 12.5	157[e]
Northeast Ditch	NE	3.9 - 4.3	7.02

[a]Unless indicated otherwise reported sample results are for validated, positive results.
[b]The sample data in this area was not taken at the subbasin outlet. The first number represents the concentration from the entire subbasin. The second represents a concentration based on source areas 560b, 560c, 560d, and SWL, which more closely matches the flow to the sampled location.
[c]See Footnote b; except second concentration is based on source areas 581b, 582c, and 581d.
[d]The first concentration results from source terms calculated without samples under buildings; the second is with samples under buildings.
[e]Modeled results are maximums for the case with stormwater controls in place.

TABLE F.2.5-3

COMPARISON OF MODELED AND SAMPLED TOTAL URANIUM CONCENTRATIONS IN GREAT MIAMI AQUIFER NEAR PADDYS RUN AND SSOD

Stream Reach	Range of Sample Results[a] (μg/L)	Modeled Results (μg/L)
CC-DD	3.44 - 68.9	80.8[b]
EE-FF	3 - 108	1.29 - 29.5[c]
SSOD	2 - 492	19.4 - 373.0[c]

[a]The sampled results are from the following wells for the years 1988-1993:
CC-DD: 2009, 2032, 2107, 2108
EE-FF: 2017, 2125, 2545, 2551
SSOD: 2014, 2049, 2065, 2386, 2387, 2397

[b]The concentration is for the case without stormwater controls since most of the sample data is from before stormwater controls were placed in operation around the waste pit area.

[c]The range of concentrations shown are for the cases with and without stormwater controls with source terms which include samples under buildings.

TABLE F.2.6-1

RESULTS OF THE CURVE NUMBER AND PRECIPITATION SENSITIVITY ANALYSES

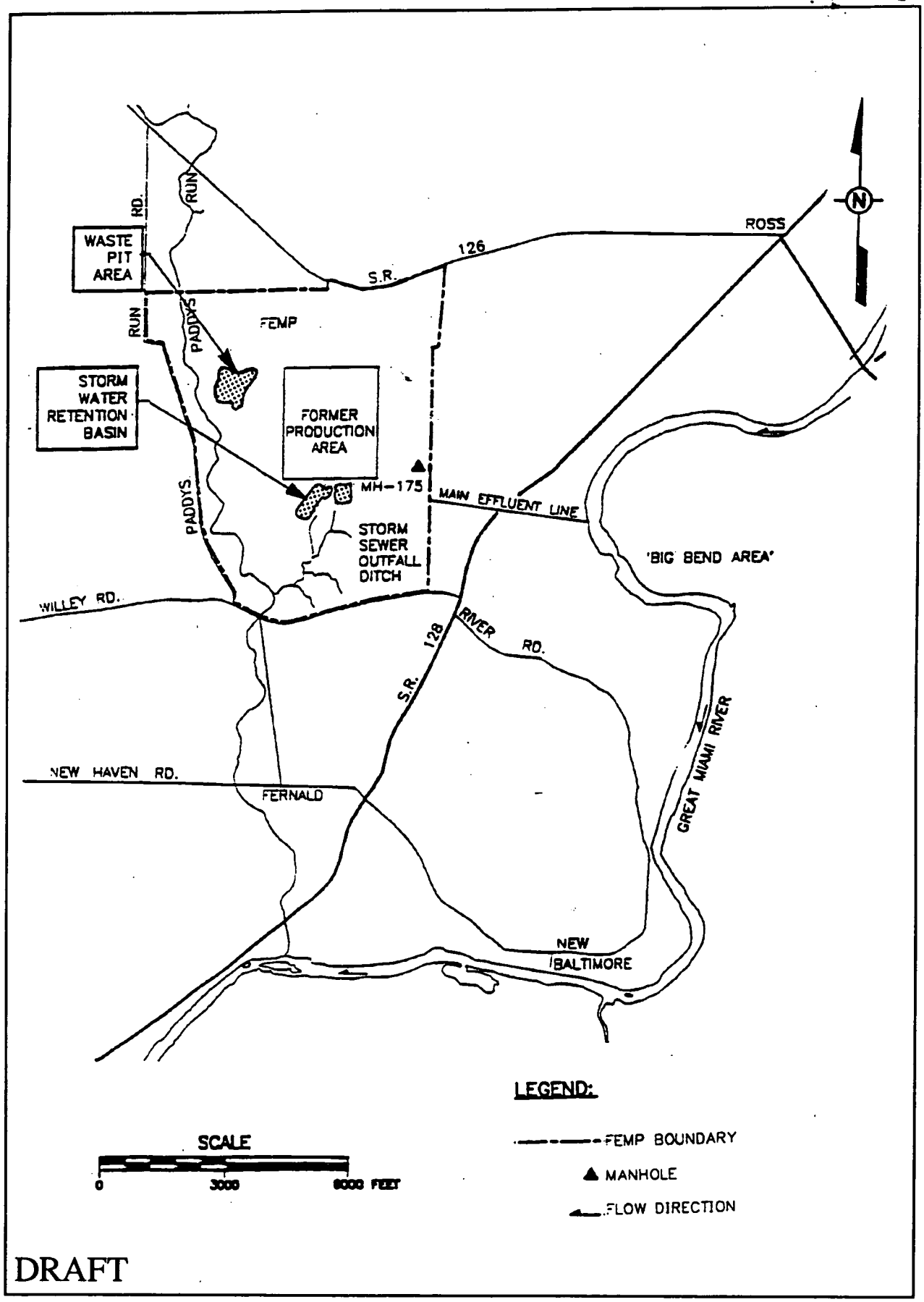
Area	Precipitation -20%	SCS CN -10%	Sensitivity Baseline	SCS CN +10%	Precipitation +20%	SCS CN AMC-III
Surface Water Concentration (mg/L)						
PDAR	3.57	3.56	3.59	3.58	3.55	3.55
SSOD	2.40	2.29	2.20	2.18	2.08	1.85
Paddys Run	2.40	2.29	2.17	2.00	1.98	1.28
Sediment Concentration (mg/kg)						
PDAR	3130	3130	3130	3130	3130	3130
SSOD	1860	1777	1660	1630	1550	1290
Paddys Run	1860	1777	1640	1500	1480	904
Total Runoff Volume (CF)						
Paddys Run Drainage Basin	5.31×10^6	5.84×10^6	1.11×10^7	1.85×10^7	1.86×10^7	3.33×10^7

Note: SCS CN = Soil Conservation Service curve number.

TABLE F.2.6-2

RESULTS OF THE SOIL/WATER PARTITIONING COEFFICIENT SENSITIVITY ANALYSIS

Area	K_d -10%	Sensitivity Baseline	K_d + 10%	$\frac{K_d}{1000}$ -10%	$\frac{K_d}{1000}$	$\frac{K_d}{1000}$ +10%
Surface Water Concentration (mg/L)						
PDAR	3.98	3.59	3.27	463	450	439
SSOD	2.44	2.20	2.00	262	256	251
Paddys Run	2.44	2.17	2.00	258	252	247
Sediment Concentration (mg/kg)						
PDAR	3130	3130	3130	1070	1130	1180
SSOD	1660	1660	1660	510	537	562
Paddys Run	1660	1660	1660	502	529	554



*ILLUSOU-SPO-116\SURFWTR HYDRO.EPS

FIGURE F.2.1 -1. SURFACE WATER HYDROLOGY

*\ILLUS\OU-5\PO-116\CONCEPT MODEL.EPS

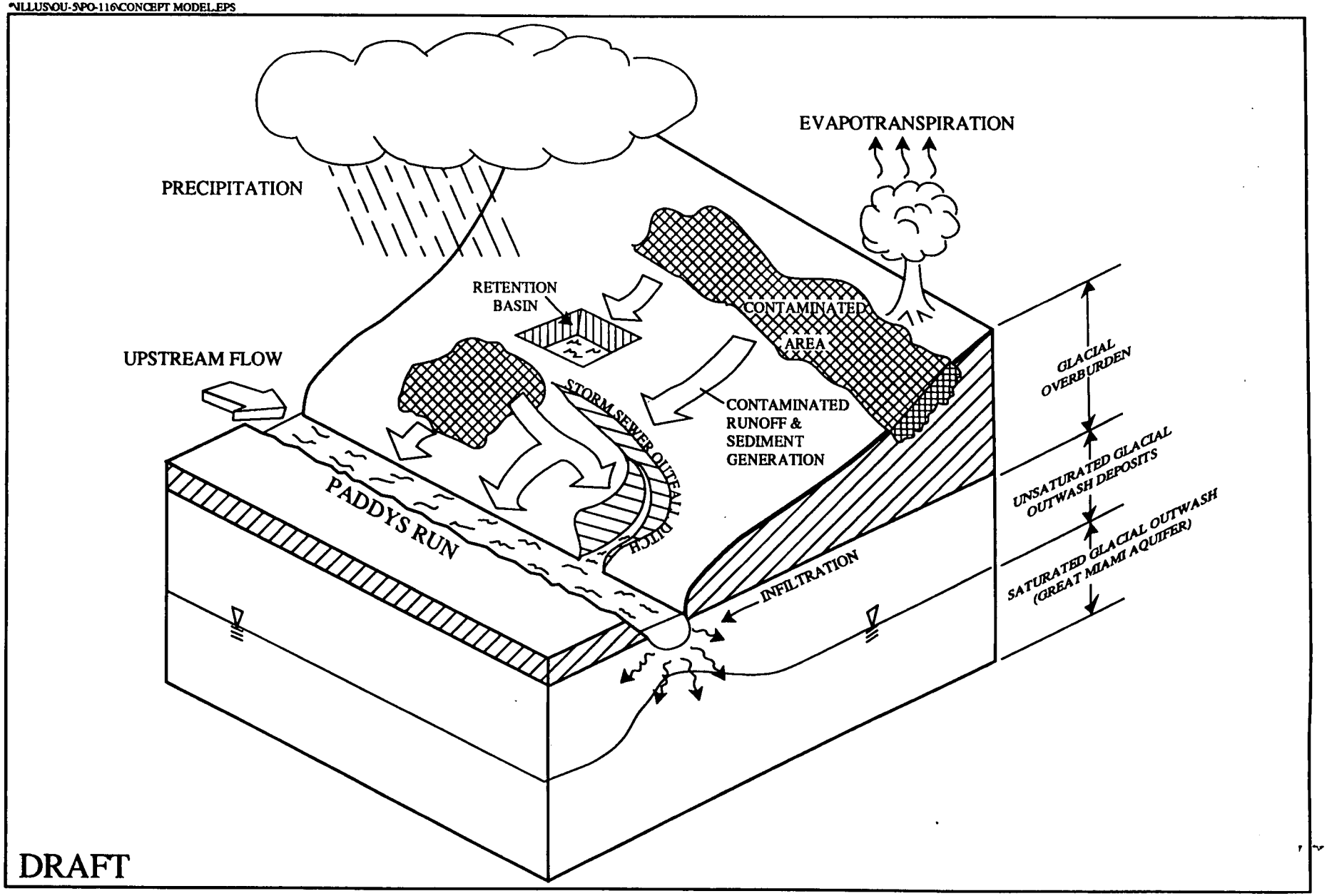


FIGURE F.2.2-1. CONCEPTUAL MODEL OF SURFACE WATER RUNOFF

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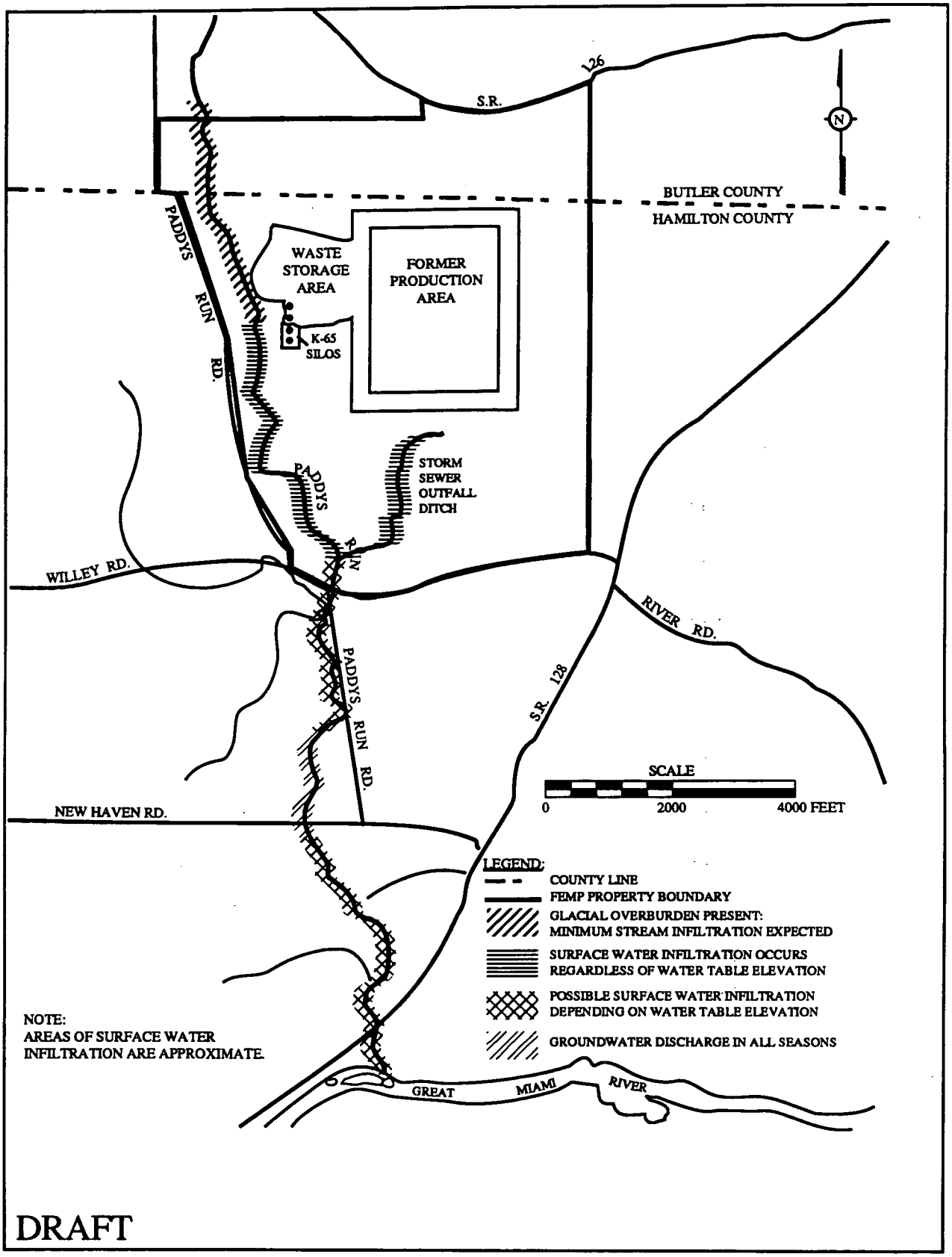


ILLUS\OU-5\PO-116\SURFWATER INFIL.EPS

FIGURE F.2.2-2. AREAS OF SURFACE WATER INFILTRATION TO THE GREAT MIAMI AQUIFER ALONG PADDYS RUN AND THE STORM SEWER OUTFALL DITCH

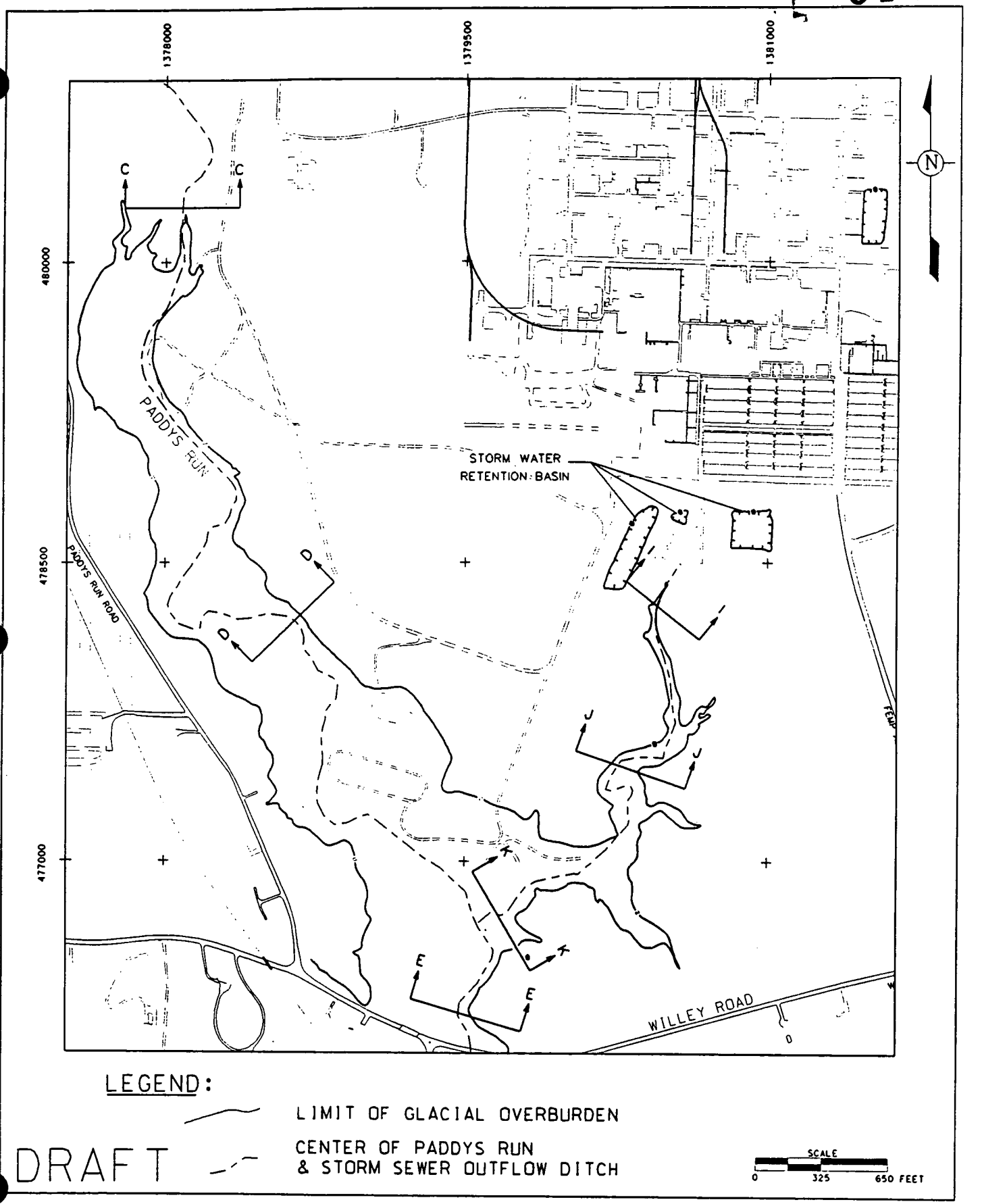
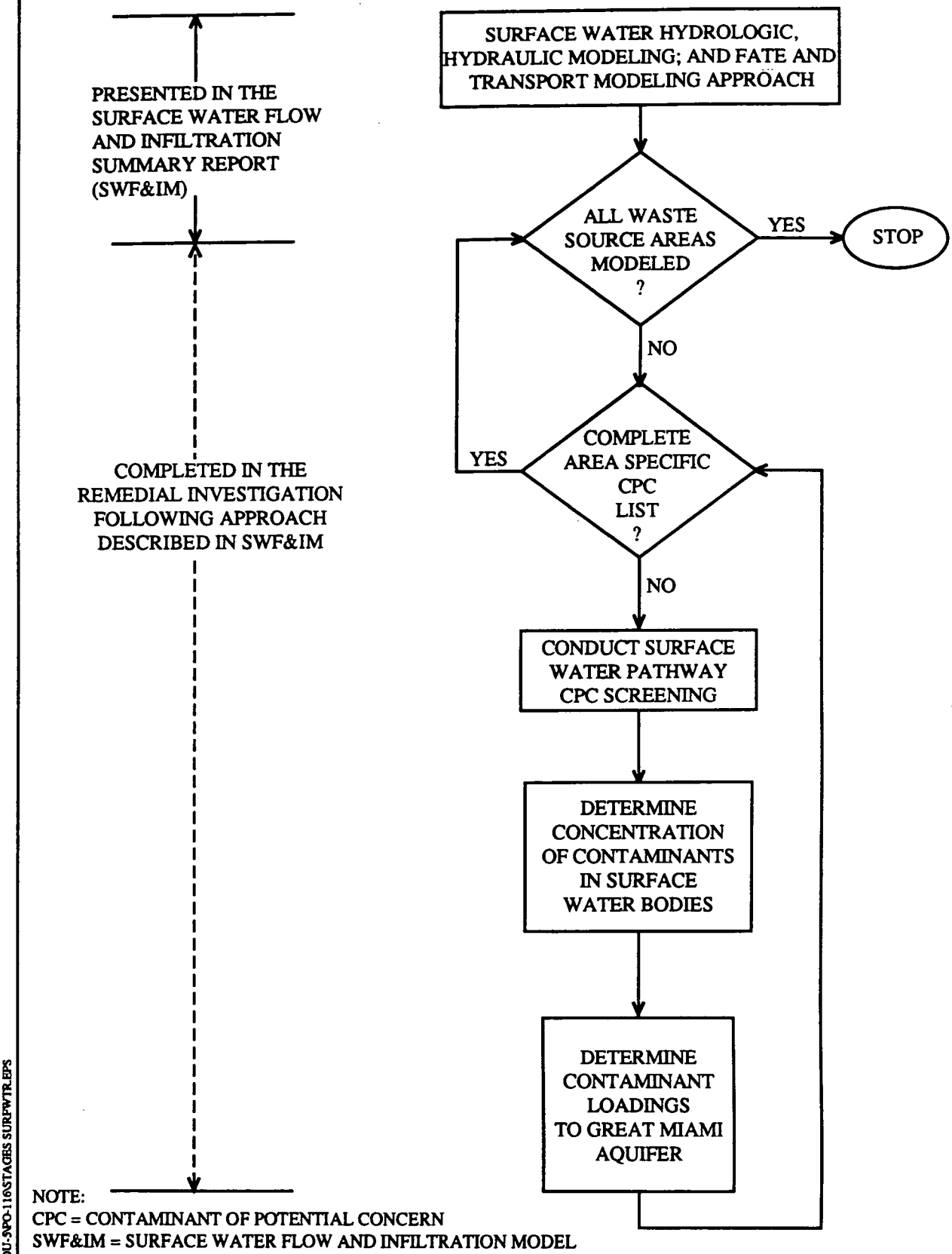


FIGURE F.2.2-3 LIMIT OF GLACIAL OVERBURDEN



NOTE:
CPC = CONTAMINANT OF POTENTIAL CONCERN
SWF&IM = SURFACE WATER FLOW AND INFILTRATION MODEL

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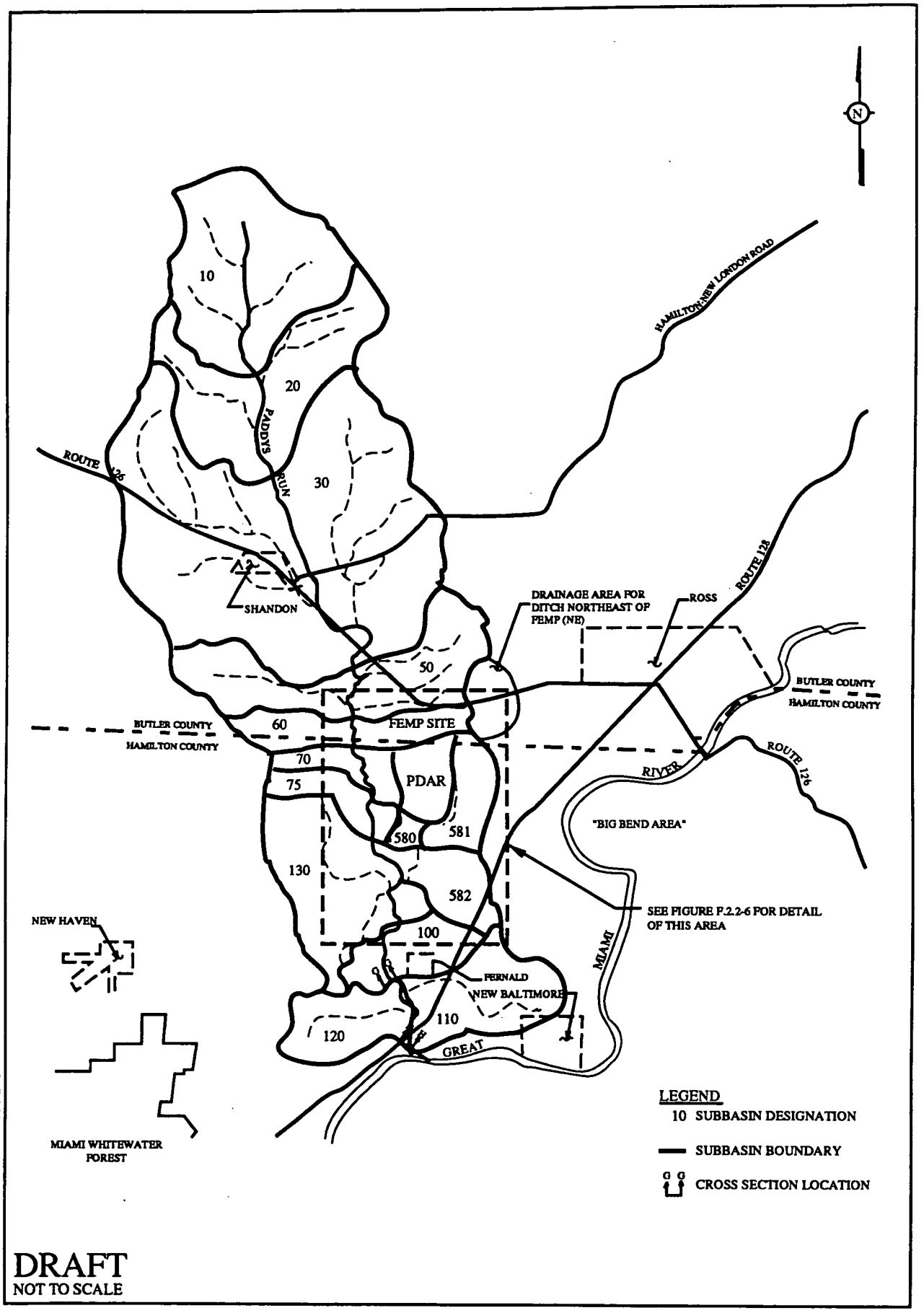
*ILLUS\OU-5\PO-116\STAGES SURFWTR.EPS

FIGURE F.2.2-4. STAGES FOR COMPLETION OF MODELING THE SURFACE WATER PATHWAY



"ILLUS\OU-5\PO-116\DRAINAGE SUBS.EPS

FIGURE F.2.2-5. PADDYS RUN DRAINAGE SUBBASINS FOR HEC-1 MODEL INFILTRATION CALCULATIONS

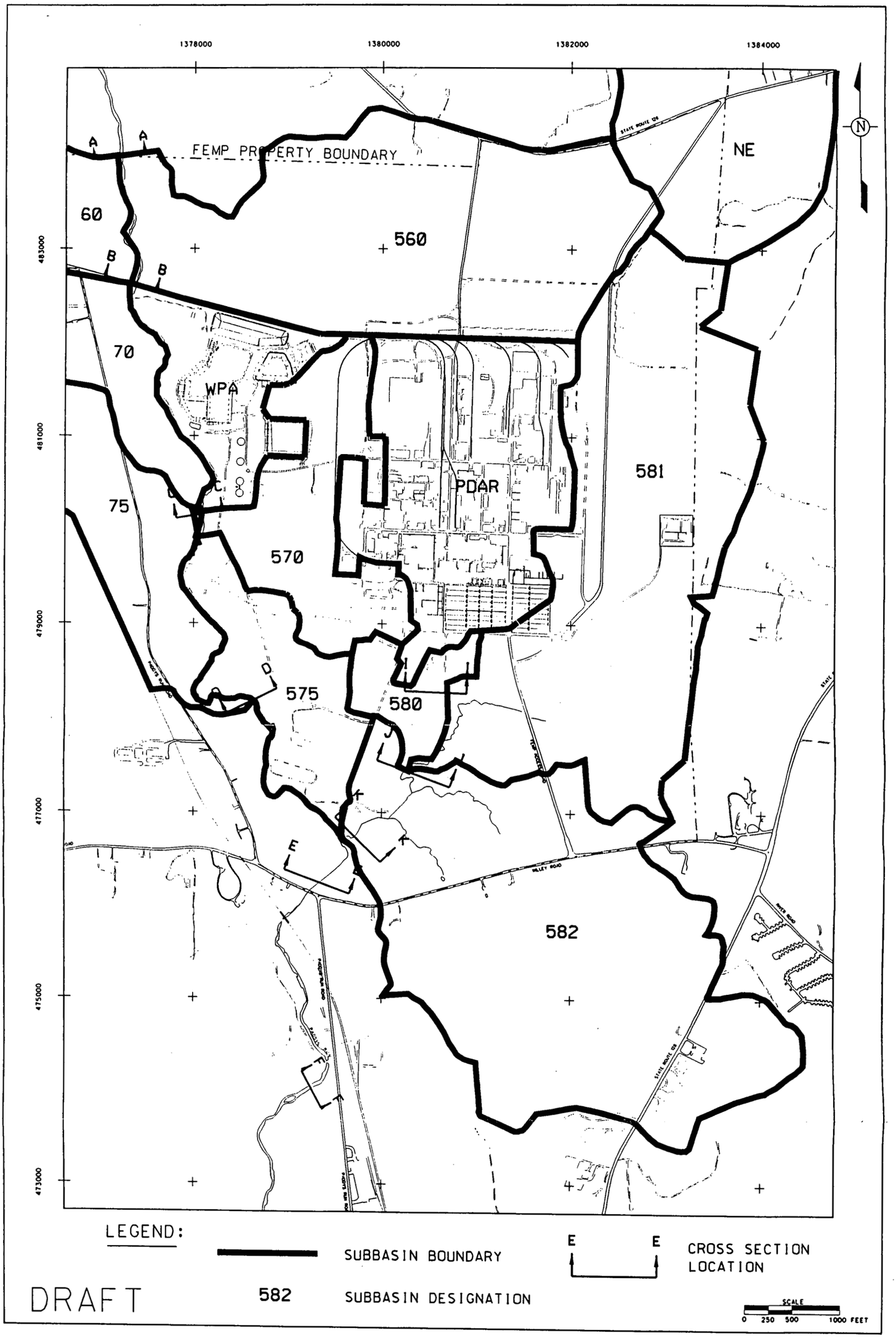
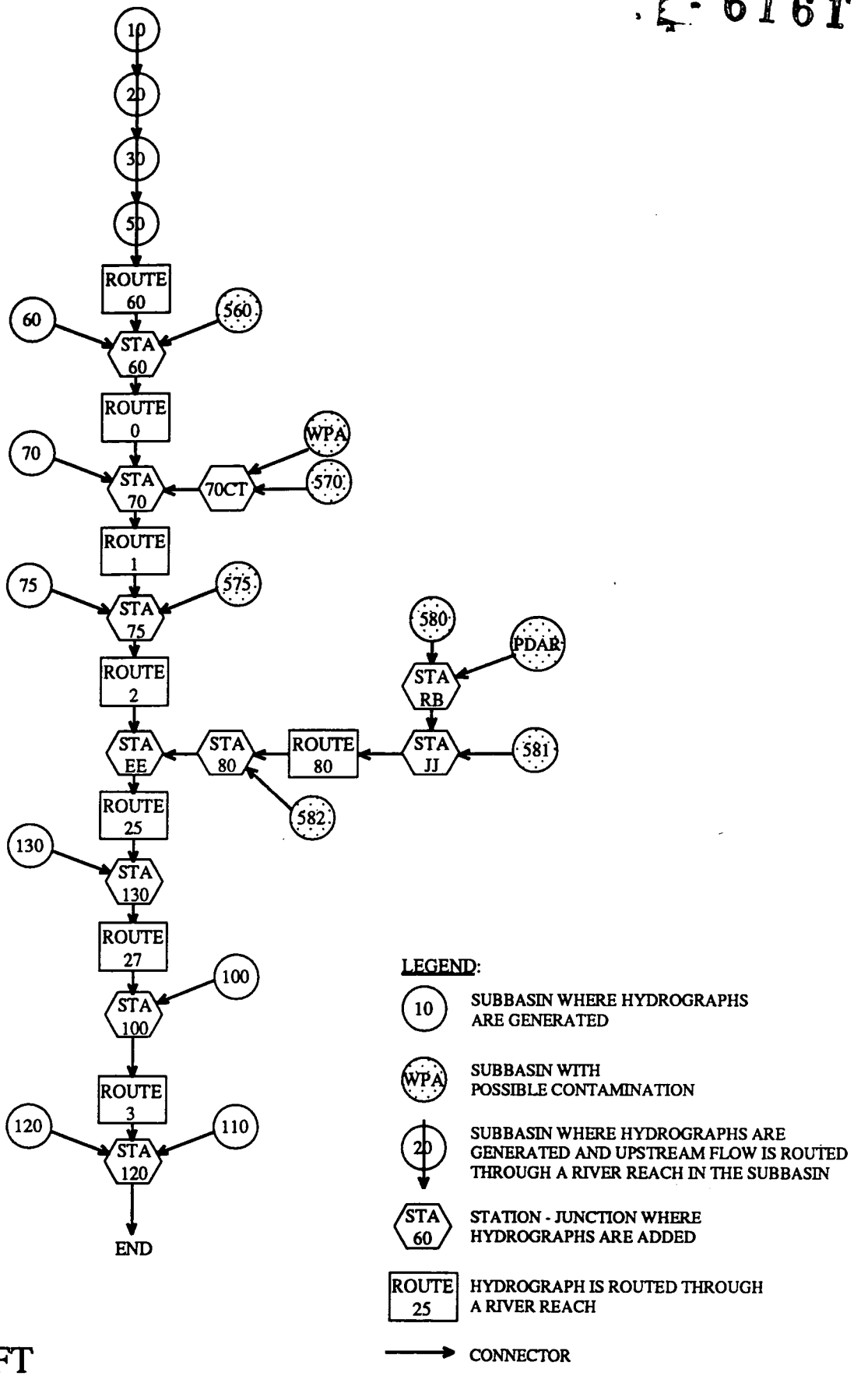


FIGURE F.2.2-6. PADDYS RUN DRAINAGE SUBBASINS FOR HEC-1 MODEL CONTAMINATION CALCULATIONS



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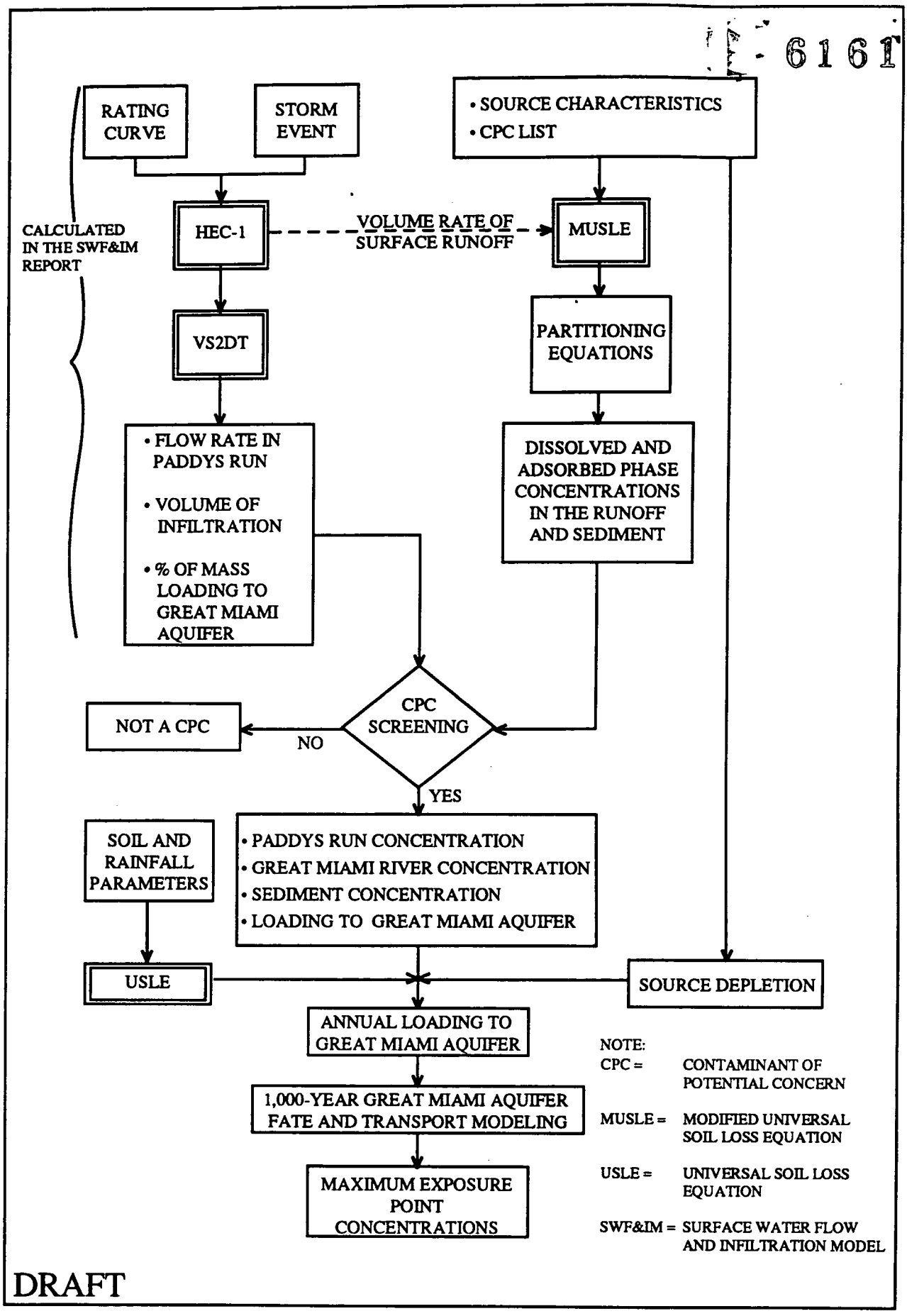
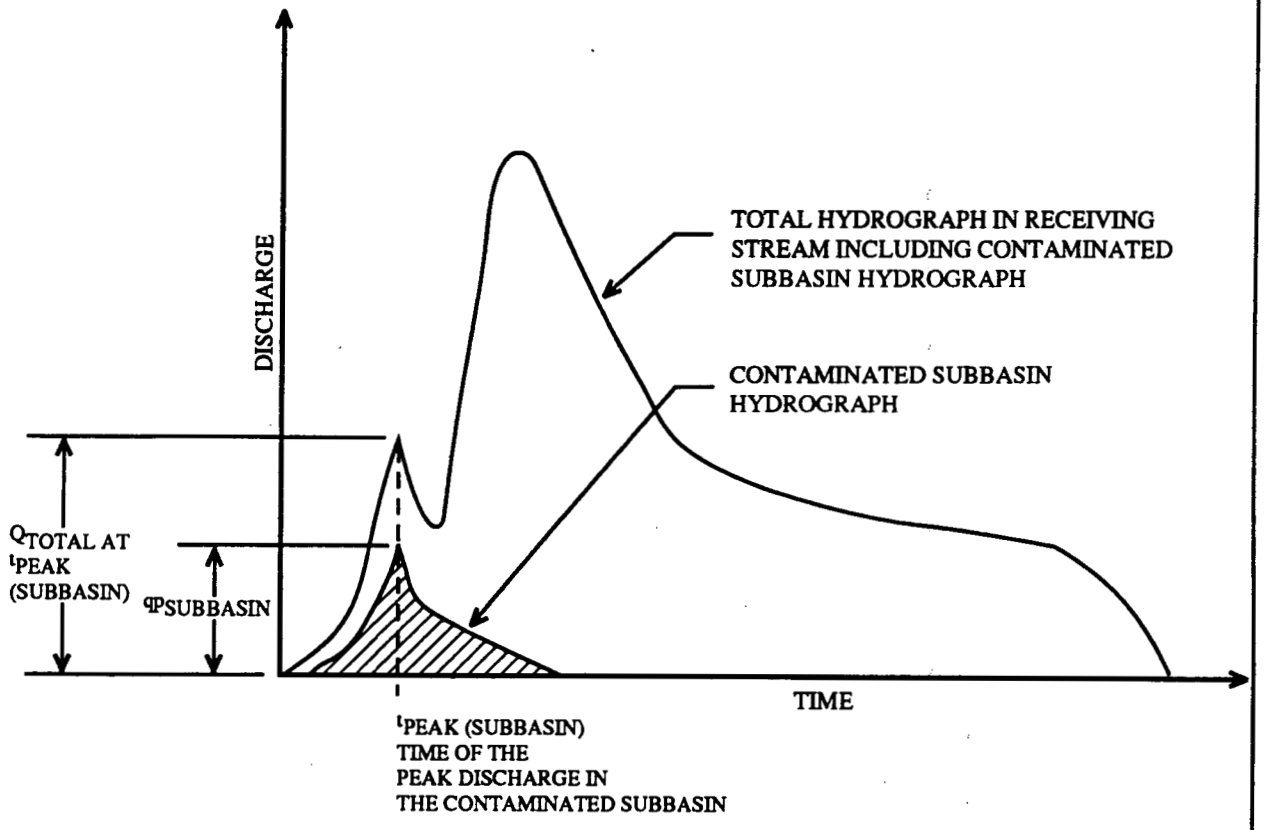
*ILLUSOU-5PO-116SCHEM HEC-1.EPS

FIGURE F.2.2-7. SCHEMATIC OF HEC-1 MODEL OF PADDYS RUN FOR CONTAMINANT CALCULATIONS



*ILLUS\OU-5\PO-116\SURFWTR PATH MODELS.EPS

FIGURE F.2.2-8. SURFACE WATER PATHWAY MODELING APPROACH



NOTE:
Q_{TOTAL} = TOTAL DISCHARGE
t_{PEAK} = TIME OF PEAK DISCHARGE IN CONTAMINATED SUBBASIN

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NOT TO SCALE

*ILLUSOU-SPO-116\RUNOFF CALC.EPS

FIGURE F.2.2-9. RUNOFF HYDROGRAPH RELATIONSHIP USED TO CALCULATE DILUTION FACTORS

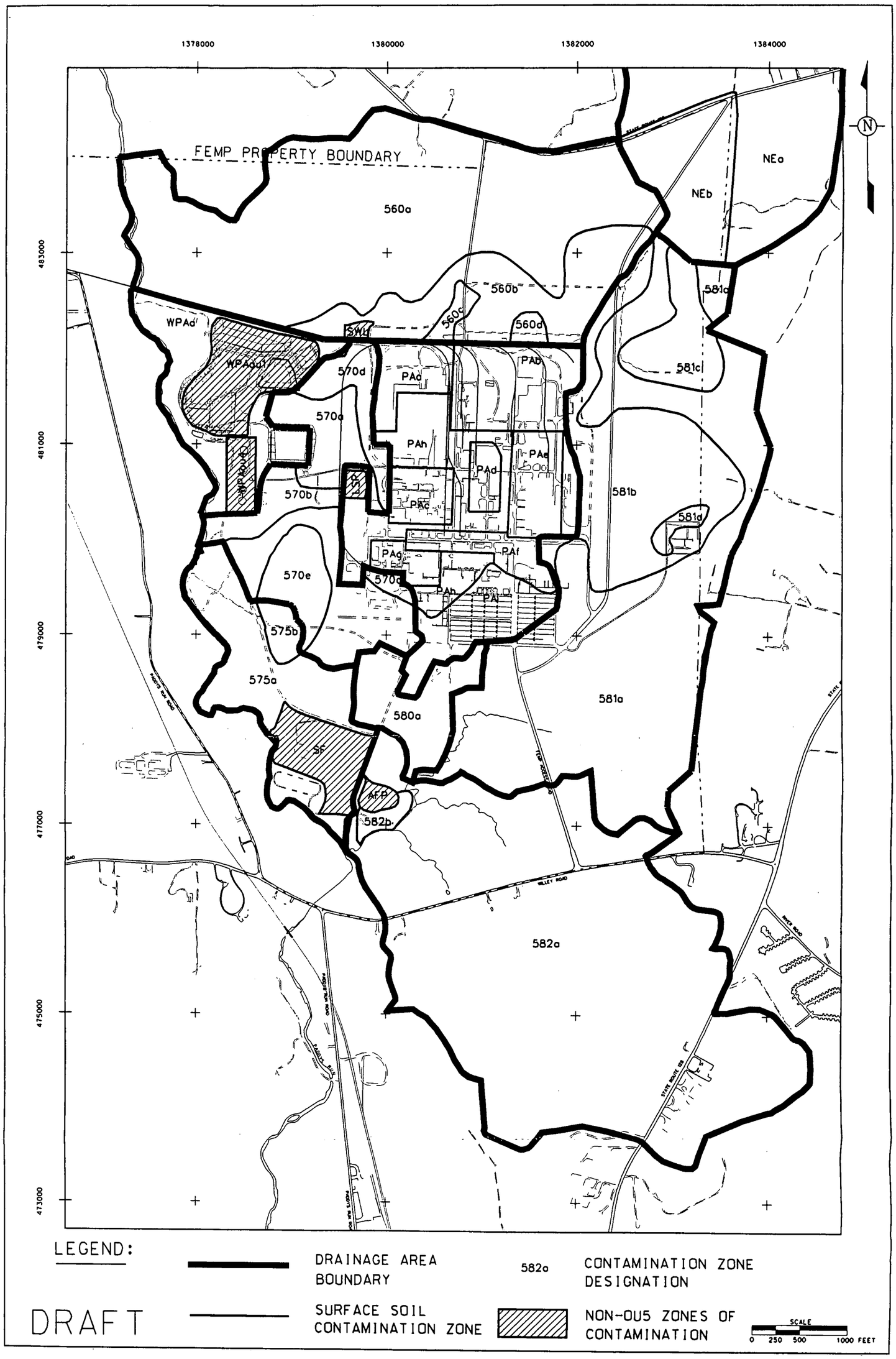

FIGURE F.2.3-1. SURFACE SOIL CONTAMINATION ZONES

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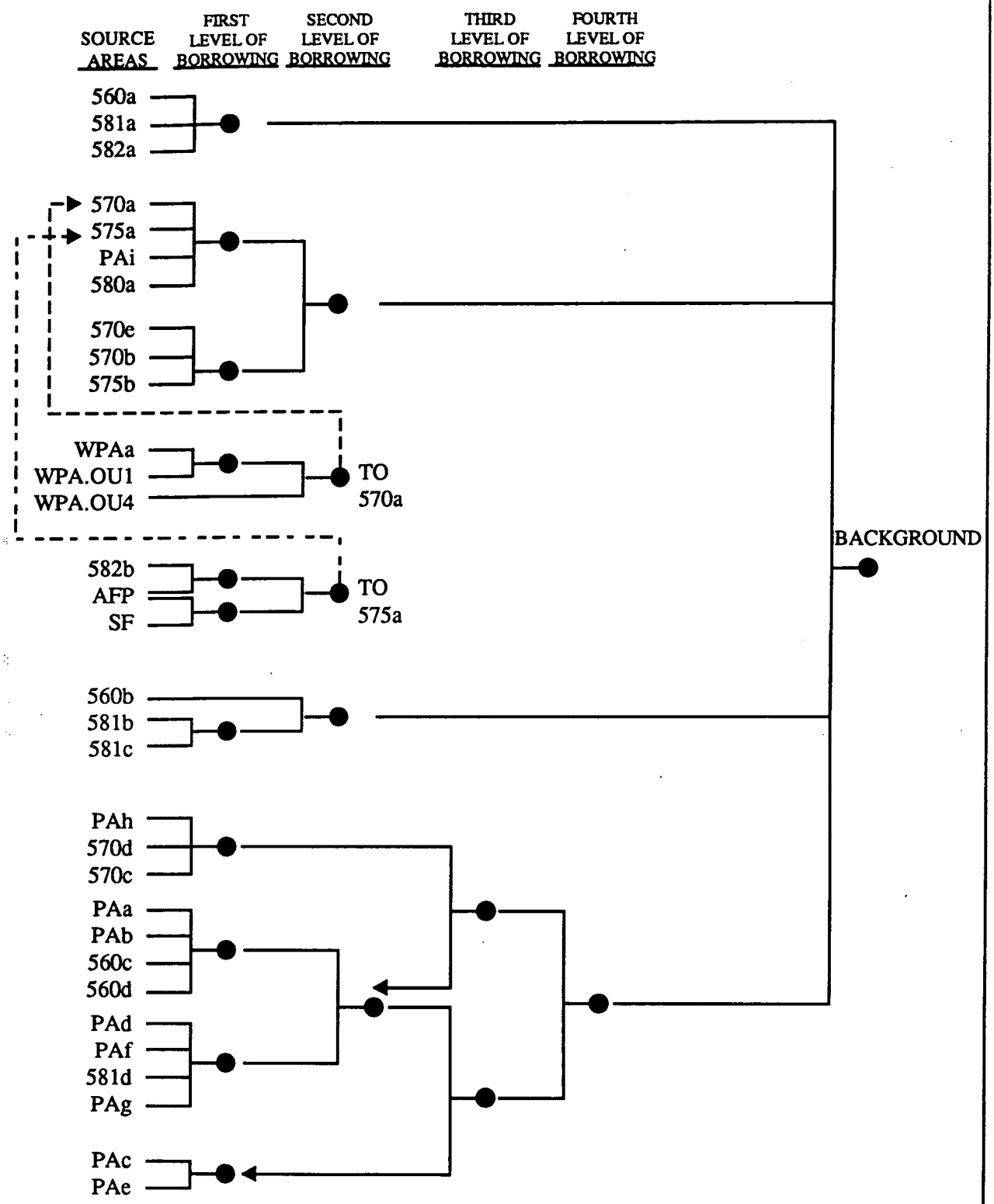

DRAFT

*ILLUSOU-SPO-116SURFSOIL CONC.EPS

FIGURE F.2.3-2. CONCENTRATION BORROWING FLOW CHART FOR SURFACE WATER MODELING SOURCE AREAS

F.2.1 Attachment

Attachment F.2.I

Surface Water Modeling Source Terms

ATTACHMENT F.2-I
TABLE-F.2-I-1, PAGE 1 OF 1
REPRESENTATIVE SOIL CONCENTRATIONS (mg/kg) FOR RADIONUCLIDES
BASELINE CONDITION

	ACTINIUM-227	CESIUM-137	NEPTUNIUM-237	PLUTONIUM-238	PLUTONIUM-239/240	PROTACTINIUM-231	RADIUM-226	RUTHENIUM-106	STRONTIUM-90	TECHNETIUM-99	THORIUM-230	THORIUM-232	URANIUM, TOTAL 1	URANIUM-234	URANIUM-235/236	URANIUM-238
560A	0.00E+00	1.16E-08	1.15E-03	0.00E+00	0.00E+00	0.00E+00	9.88E-07	0.00E+00	1.02E-08	7.65E-05	8.67E-05	9.29E+00	1.55E+01	6.71E-04	2.92E-01	2.32E+01
560B	0.00E+00	8.04E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-06	0.00E+00	3.36E-08	9.41E-05	2.19E-04	1.34E+01	3.04E+02	5.11E-03	1.21E+00	8.69E+02
560C	0.00E+00	1.62E-08	0.00E+00	1.29E-07	4.67E-05	0.00E+00	2.33E-06	0.00E+00	3.10E-09	1.61E-03	7.33E-04	1.04E+02	1.17E+03	4.04E-02	7.87E+00	1.15E+03
swl	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	0.00E+00	3.10E-09	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
560D	0.00E+00	6.94E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.98E-03	0.00E+00	4.74E-08	0.00E+00	5.52E-02	7.36E+01	3.62E+02	5.13E-03	1.44E+00	3.60E+02
570A	0.00E+00	1.50E-08	8.47E-04	0.00E+00	0.00E+00	0.00E+00	1.75E-06	0.00E+00	6.57E-09	3.00E-04	3.40E-04	2.09E+01	7.79E+01	1.77E-03	4.17E-01	7.74E+01
570B	0.00E+00	2.32E-08	0.00E+00	2.34E-08	9.82E-06	0.00E+00	1.34E-06	3.14E-09	1.31E-08	2.82E-04	1.11E-02	6.00E+01	4.28E+02	8.68E-03	1.67E+00	4.26E+02
570C	0.00E+00	5.78E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.01E-06	0.00E+00	5.11E-09	0.00E+00	7.28E-05	7.27E+00	3.60E+01	1.90E-03	4.17E-01	3.54E+01
570D	0.00E+00	1.85E-08	2.94E-04	1.93E-07	9.66E-06	0.00E+00	1.25E-05	0.00E+00	1.24E-08	1.94E-03	2.82E-03	1.14E+02	2.77E+03	2.88E-02	1.06E+01	3.31E+03
570E	0.00E+00	1.16E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-06	0.00E+00	8.03E-09	0.00E+00	4.08E-04	4.73E+01	6.35E+01	3.38E-03	6.48E-01	6.28E+01
575A	0.00E+00	6.94E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.08E-07	0.00E+00	3.10E-09	0.00E+00	6.89E-04	7.27E+00	2.40E+01	7.60E-04	1.28E-01	2.23E+01
575B	0.00E+00	1.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.06E-07	0.00E+00	3.10E-09	0.00E+00	8.25E-05	6.36E+00	5.88E+01	2.88E-02	1.06E+01	6.28E+01
SF	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	0.00E+00	7.05E-09	8.35E-03	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
580A	0.00E+00	5.78E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.03E-07	0.00E+00	3.10E-09	0.00E+00	5.83E-05	7.27E+00	1.87E+01	2.09E-04	4.20E-02	5.36E+00
581A	0.00E+00	9.25E-09	0.00E+00	0.00E+00	1.45E-05	0.00E+00	1.31E-06	0.00E+00	1.12E-08	6.47E-05	8.77E-05	8.50E+00	2.13E+01	7.94E-04	3.24E-01	1.57E+01
581B	1.66E-08	6.89E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.67E-06	0.00E+00	1.23E-08	6.65E-04	1.36E-03	6.00E+01	5.63E+02	1.49E-02	6.20E+00	7.71E+02
581C	0.00E+00	1.16E-08	0.00E+00	8.77E-08	0.00E+00	0.00E+00	1.20E-06	0.00E+00	3.14E-08	0.00E+00	1.63E-04	1.27E+01	4.76E+01	2.37E-03	5.42E-01	4.70E+01
581D	5.46E-08	8.22E-09	0.00E+00	8.83E-06	2.42E-05	1.07E-04	2.79E-05	0.00E+00	2.70E-08	1.34E-02	3.91E-02	5.63E+02	7.57E+03	2.62E-01	6.71E+01	4.40E+03
582A	0.00E+00	9.25E-09	0.00E+00	0.00E+00	9.66E-06	0.00E+00	1.09E-06	0.00E+00	8.76E-09	0.00E+00	1.44E-04	1.05E+01	1.15E+01	7.44E-04	7.55E-02	1.58E+01
582B	0.00E+00	1.06E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-06	0.00E+00	3.10E-09	0.00E+00	7.20E-04	1.46E+01	4.44E+02	5.61E-03	1.13E+00	4.42E+02
AFP	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	0.00E+00	3.10E-09	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
PAA	0.00E+00	5.78E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-03	0.00E+00	2.26E-08	0.00E+00	1.33E-01	2.85E+02	1.23E+04	6.20E-01	9.44E+01	1.22E+04
PAB	0.00E+00	8.09E-09	0.00E+00	4.20E-08	1.05E-04	0.00E+00	1.95E-06	0.00E+00	2.48E-08	4.76E-04	1.11E-03	4.64E+01	7.08E+02	4.55E-02	6.94E+00	8.21E+02
PAC	0.00E+00	2.89E-09	3.73E-03	0.00E+00	1.15E-05	0.00E+00	6.98E-06	0.00E+00	1.49E-08	2.96E-04	3.62E-03	1.19E+01	9.14E+02	9.34E-02	2.94E+01	1.66E+03
PAD	0.00E+00	6.94E-09	0.00E+00	4.98E-08	0.00E+00	0.00E+00	1.21E-06	0.00E+00	8.10E-09	1.29E-04	3.99E-04	1.55E+01	4.07E+02	2.06E-02	4.02E+00	4.17E+02
PAE	0.00E+00	5.78E-09	1.01E-03	6.14E-08	2.43E-05	0.00E+00	8.45E-07	0.00E+00	3.03E-08	1.24E-02	3.98E-04	3.24E+02	6.77E+03	6.79E-01	1.23E+02	1.63E+04
PAF	5.46E-08	7.03E-09	0.00E+00	8.83E-06	0.00E+00	1.07E-04	1.27E-06	0.00E+00	1.39E-08	1.41E-04	5.01E-04	1.83E+01	2.22E+02	1.19E-02	7.04E+00	2.35E+02
PAG	0.00E+00	3.35E-08	0.00E+00	1.50E-08	2.08E-04	0.00E+00	3.52E-06	0.00E+00	2.82E-08	1.18E-03	1.00E-02	2.57E+03	4.31E+04	2.13E+00	4.40E+02	4.26E+04
PAH	0.00E+00	1.03E-08	9.58E-04	0.00E+00	0.00E+00	0.00E+00	3.25E-06	2.90E-09	1.62E-08	9.41E-05	1.06E-02	1.05E+02	9.94E+01	4.65E-03	4.38E-01	1.56E+02
PAI	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.63E-06	0.00E+00	3.10E-09	0.00E+00	7.28E-05	7.78E+00	4.17E+01	9.32E-04	9.26E-02	1.67E+01
LSP	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	0.00E+00	3.10E-09	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
WPAA	0.00E+00	9.25E-09	1.18E-03	4.09E-08	3.43E-06	0.00E+00	3.90E-05	0.00E+00	7.30E-09	3.12E-04	4.39E-04	2.31E+01	3.74E+02	2.83E-03	2.92E+00	1.02E+03
WPA.OU1	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	0.00E+00	3.10E-09	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
WPA.OU4	0.00E+00	5.10E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-06	0.00E+00	3.10E-09	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00

ATTACHMENT F.2-I
TABLE-F.2-I-2, PAGE 1 OF 2
REPRESENTATIVE SOIL CONCENTRATIONS (mg/kg) FOR INORGANICS
BASELINE AND FUTURE CONDITIONS

	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	BORON	CADMIUM	CHROMIUM	CHROMIUM (HEX)	COPPER	CYANIDE	LEAD	MAGNESIUM	MANGANESE	MERCURY	MOLYBDENUM
560A	1.04E+04	3.20E+00	1.21E+01	9.53E+01	1.60E+00	1.43E+01	1.90E+00	1.46E+01	1.46E+00	1.59E+01	5.30E-01	2.18E+01	2.81E+04	8.63E+02	3.00E-01	1.24E+01
560B	9.76E+03	2.64E+01	8.82E+00	9.94E+01	1.00E+00	1.37E+01	6.60E+00	3.43E+01	3.43E+00	2.68E+01	3.12E-01	2.20E+02	4.86E+04	8.30E+02	3.00E-01	1.11E+01
560C	8.59E+03	7.60E-01	5.66E+00	8.62E+01	6.30E-01	1.37E+01	7.60E+00	1.72E+01	1.72E+00	5.29E+01	1.20E+00	1.14E+02	2.99E+04	4.75E+02	3.00E-01	4.60E+00
SWL	8.81E+03	7.60E-01	5.57E+00	6.77E+01	6.00E-01	1.37E+01	8.70E-01	1.13E+01	1.13E+00	8.60E+00	2.70E-01	1.89E+01	1.93E+03	8.14E+02	3.00E-01	2.70E+00
560D	1.23E+04	7.60E-01	7.30E+00	9.91E+01	7.00E-01	1.37E+01	5.20E-01	1.35E+01	1.35E+00	1.59E+01	1.10E-01	1.82E+01	2.52E+03	7.89E+02	3.00E-01	5.30E+00
570A	1.18E+04	7.60E-01	2.60E+01	1.05E+02	2.10E+00	1.37E+01	6.20E+00	1.67E+01	1.67E+00	1.83E+01	4.50E-01	2.38E+01	2.32E+04	7.94E+02	3.00E-01	5.20E+00
570B	1.08E+04	2.74E+01	3.25E+01	8.34E+01	1.01E+00	1.37E+01	5.25E+00	1.82E+01	1.82E+00	2.03E+01	1.80E-01	2.24E+01	2.24E+04	5.60E+02	3.00E-01	4.17E+00
570C	1.20E+04	2.64E+01	6.23E+00	9.90E+01	1.59E+00	1.37E+01	3.96E+00	2.09E+01	2.09E+00	3.80E+01	5.00E-01	3.37E+01	2.23E+04	7.59E+02	8.00E-02	5.00E+00
570D	1.20E+04	2.64E+01	6.23E+00	9.90E+01	1.59E+00	1.37E+01	3.96E+00	2.09E+01	2.09E+00	3.80E+01	5.00E-01	3.37E+01	2.23E+04	7.59E+02	8.00E-02	5.00E+00
570E	1.08E+04	7.60E-01	3.25E+01	1.09E+02	6.00E-01	1.37E+01	5.25E+00	1.13E+01	1.13E+00	2.03E+01	4.40E-01	2.24E+01	2.05E+03	5.60E+02	3.00E-01	2.70E+00
575A	1.09E+04	7.60E-01	7.30E+00	1.08E+02	1.70E+00	1.37E+01	5.20E-01	1.40E+01	1.40E+00	1.43E+01	3.70E-01	2.24E+01	2.98E+04	1.35E+03	3.00E-01	2.70E+00
575B	1.01E+04	7.60E-01	3.70E+00	1.09E+02	6.00E-01	1.37E+01	5.20E-01	1.13E+01	1.13E+00	1.17E+01	4.40E-01	2.24E+01	2.05E+03	1.17E+03	3.00E-01	2.70E+00
SF	8.81E+03	7.60E-01	5.57E+00	6.77E+01	6.00E-01	1.37E+01	8.70E-01	1.16E+01	1.16E+00	8.60E+00	2.70E-01	1.89E+01	1.93E+03	8.14E+02	3.00E-01	2.70E+00
580A	8.67E+03	7.60E-01	6.50E+00	7.66E+01	6.00E-01	1.37E+01	1.30E+00	1.13E+01	1.13E+00	1.44E+01	2.70E-01	5.48E+01	8.85E+03	4.43E+02	3.00E-01	2.70E+00
581A	8.64E+03	4.10E+00	9.84E+00	1.03E+02	1.40E+00	1.43E+01	4.90E-01	1.46E+01	1.46E+00	1.04E+02	9.10E-01	2.16E+03	3.54E+04	3.42E+03	5.70E-01	8.30E-01
581B	1.66E+04	2.15E+01	6.16E+00	1.37E+02	1.11E+00	1.37E+01	1.60E+00	2.10E+01	2.10E+00	1.72E+01	8.80E-01	5.70E+02	3.40E+04	1.74E+03	1.20E-01	7.90E+00
581C	7.09E+03	7.60E-01	3.30E+00	7.01E+01	4.80E-01	1.37E+01	5.20E-01	9.80E+00	9.80E-01	7.60E+00	2.70E-01	1.50E+01	1.20E+03	9.02E+02	3.00E-01	7.90E+00
581D	1.01E+04	2.90E+00	6.90E+00	1.25E+02	1.30E+00	1.37E+01	1.90E+00	1.47E+01	1.47E+00	1.19E+01	6.50E-01	2.99E+01	1.76E+03	2.04E+03	3.00E-01	8.50E+00
582A	9.86E+03	7.60E-01	8.59E+00	7.48E+01	1.40E+00	1.43E+01	7.50E-01	1.38E+01	1.38E+00	1.89E+01	4.30E-01	2.31E+01	1.77E+04	6.19E+02	3.00E-01	6.50E+00
582B	1.04E+04	7.60E-01	2.72E+01	1.09E+02	2.10E+00	1.37E+01	7.40E-01	1.34E+01	1.34E+00	2.36E+01	3.00E-01	2.55E+01	1.66E+04	4.63E+02	3.00E-01	2.30E+00
AFP	8.81E+03	7.60E-01	5.57E+00	6.77E+01	6.00E-01	1.37E+01	8.70E-01	1.16E+01	1.16E+00	8.60E+00	2.70E-01	1.89E+01	1.93E+03	8.14E+02	3.00E-01	2.70E+00
PAA	1.36E+04	3.81E+01	7.67E+00	1.04E+02	6.22E-01	1.37E+01	5.90E+00	2.13E+01	2.13E+00	5.16E+01	1.50E+00	2.45E+01	3.95E+04	7.06E+02	2.00E-01	3.56E+00
PAB	1.13E+04	7.60E-01	2.31E+01	5.12E+02	1.15E+00	1.37E+01	4.21E+00	3.75E+01	3.75E+00	2.07E+02	6.30E-01	8.60E+01	2.45E+04	9.08E+02	3.20E-01	1.24E+01
PAC	1.01E+04	2.12E+01	7.98E+00	9.56E+01	2.13E+00	1.37E+01	6.90E+00	3.81E+01	3.81E+00	3.23E+01	3.00E-01	4.40E+02	3.65E+04	6.17E+02	2.10E+00	1.31E+01
PAD	1.02E+04	7.60E-01	9.60E+00	4.56E+02	8.59E-01	1.37E+01	6.70E+00	4.69E+01	4.69E+00	3.76E+01	2.70E-01	2.93E+02	3.51E+04	6.14E+02	1.30E+00	3.70E+00
PAE	1.03E+04	7.60E-01	7.70E+00	1.07E+02	1.14E+00	1.37E+01	5.07E+00	2.42E+01	2.42E+00	2.30E+01	1.30E+00	7.65E+01	4.15E+04	6.36E+02	3.70E-01	6.20E+00
PAF	1.98E+04	7.60E-01	1.16E+01	1.45E+02	3.50E+00	1.37E+01	1.10E+00	2.43E+01	2.43E+00	2.32E+01	2.70E-01	2.17E+01	4.46E+04	6.92E+02	3.00E-01	2.70E+00
PAG	1.53E+04	7.60E-01	1.22E+01	4.14E+02	1.31E+00	1.37E+01	5.40E+00	2.39E+01	2.39E+00	6.94E+01	5.20E-01	5.11E+01	2.78E+04	8.97E+02	1.10E+00	4.70E+00
PAH	9.70E+03	7.60E-01	6.09E+00	8.31E+01	1.37E+00	1.37E+01	5.80E+00	3.77E+01	3.77E+00	2.10E+01	6.90E-01	6.34E+01	2.65E+04	1.07E+03	5.30E-01	4.07E+00
PAI	1.58E+04	7.60E-01	6.40E+00	1.83E+02	1.80E+00	1.37E+01	5.20E-01	1.97E+01	1.97E+00	1.96E+01	2.70E-01	5.48E+01	2.28E+04	1.72E+03	3.00E-01	2.70E+00
LSP	8.81E+03	7.60E-01	5.57E+00	6.77E+01	6.00E-01	1.37E+01	8.70E-01	1.16E+01	1.16E+00	8.60E+00	2.70E-01	1.89E+01	1.93E+03	8.14E+02	3.00E-01	2.70E+00
WPAA	9.09E+03	3.25E+01	6.88E+00	6.38E+01	7.34E-01	1.37E+01	5.90E+00	1.41E+01	1.41E+00	2.69E+01	3.70E-01	2.60E+01	2.24E+04	8.41E+02	2.00E-02	3.55E+00
WPA.OU1	8.81E+03	7.60E-01	5.57E+00	6.77E+01	6.00E-01	1.37E+01	8.70E-01	1.16E+01	1.16E+00	8.60E+00	2.70E-01	1.89E+01	1.93E+03	8.14E+02	3.00E-01	2.70E+00
WPA.OU4	8.81E+03	7.60E-01	5.57E+00	6.77E+01	6.00E-01	1.37E+01	8.70E-01	1.16E+01	1.16E+00	8.60E+00	2.70E-01	1.89E+01	1.93E+03	8.14E+02	3.00E-01	2.70E+00

ATTACHMENT F.2-I
TABLE-F.2-I-2, PAGE 2 OF 2
REPRESENTATIVE SOIL CONCENTRATIONS (mg/kg) FOR INORGANICS
BASELINE AND FUTURE CONDITIONS

	NICKEL	SILVER	THALLIUM	VANADIUM
560A	1.91E+01	7.40E+00	6.70E-01	2.53E+01
560B	2.34E+01	9.30E+00	5.80E-01	2.69E+01
560C	2.57E+01	7.90E+00	5.80E-01	2.01E+01
SWL	1.27E+01	4.50E-01	5.80E-01	2.23E+01
560D	1.17E+01	6.10E+00	5.80E-01	3.74E+01
570A	2.32E+01	7.70E+00	2.20E-01	3.45E+01
570B	2.94E+01	7.95E+00	5.80E-01	2.61E+01
570C	2.90E+01	7.24E+00	4.90E-01	2.80E+01
570D	2.90E+01	7.24E+00	4.90E-01	2.80E+01
570E	1.07E+01	7.95E+00	5.80E-01	2.61E+01
575A	1.61E+01	4.80E-01	5.80E-01	2.69E+01
575B	1.07E+01	4.70E-01	5.80E-01	2.31E+01
SF	1.27E+01	4.50E-01	5.80E-01	2.23E+01
580A	1.31E+01	4.50E-01	5.80E-01	2.25E+01
581A	2.06E+01	6.10E+00	7.50E-01	2.44E+01
581B	2.82E+01	1.80E+00	4.70E-01	3.71E+01
581C	1.10E+01	4.50E-01	5.80E-01	2.28E+01
581D	1.52E+01	4.50E-01	5.80E-01	3.88E+01
582A	1.83E+01	4.50E-01	3.20E-01	2.32E+01
582B	2.01E+01	4.50E-01	7.70E-01	2.63E+01
AFP	1.27E+01	4.50E-01	5.80E-01	2.23E+01
PAA	2.62E+01	9.30E+00	2.85E-01	2.82E+01
PAB	3.27E+01	7.50E+00	4.20E-01	2.73E+01
PAC	3.97E+01	1.72E+01	2.90E-01	2.80E+01
PAD	7.22E+01	5.90E+00	3.90E-01	2.63E+01
PAE	2.95E+01	6.90E+00	2.30E-01	2.70E+01
PAF	3.79E+01	4.50E-01	3.70E-01	3.54E+01
PAG	3.74E+01	7.00E+00	4.40E-01	3.24E+01
PAH	2.75E+01	4.58E+00	5.00E-01	2.46E+01
PAI	3.37E+01	4.50E-01	3.00E-01	2.39E+01
LSP	1.27E+01	4.50E-01	5.80E-01	2.23E+01
WPAA	2.20E+01	1.02E+01	2.70E-01	2.27E+01
WPA.OU1	1.27E+01	4.50E-01	5.80E-01	2.23E+01
WPA.OU4	1.27E+01	4.50E-01	5.80E-01	2.23E+01

ATTACHMENT F.2-I
TABLE F.2-I-3, PAGE 1 OF 3
REPRESENTATIVE SURFACE SOIL CONCENTRATION (mg/kg) FOR ORGANICS
BASELINE CONDITIONS

	1,1,2,2-TETRACHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHENE	1,2-DICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2,4-DICHLOROPHENOL	2,4-DINITROTOLUENE	2,6-DINITROTOLUENE	2-BUTANONE	2-CHLOROPHENOL	3,3'-DICHLOROBENZIDINE	4-METHYL-2-PENTANONE	4-METHYLPHENOL	4-NITROANILINE	ACETONE	ALDRIN	ALPHA-CHLORDANE	AROCLOR-1254	AROCLOR-1260
560A	0	0	0	0	0	0	0	0	0	0	0	0.014	0	0	0.003	0	0	0	0
560B	0	0	0	0	0	0	0	0	0	0.048	0.19	0.001	0	0.33	0	0	0	2.1	0
560C	0	0	0	0	0	0	0	0	0.013	0	0	0	0.061	0	0	0	0	0.045	1.3
SWL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.12	0
570C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.24	0
570D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.24	0
570E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575A	0	0	0	0	0	0	0	0	0	0	0	0	0.19	0	0.022	0	0	0	0
575B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
581A	0	0	0.006	0	0	0	0	0	0.001	0	0	0	0	0	0.011	0	0	0.2	0
581B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.012	0	0	0.12	0
581C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
581D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
582A	0	0	0	0	0	0	0	0	0.002	0	0	0	1.7	0	0	0	0	0	0
582B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.022	0	0	0	0
AFP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAA	0	0	0	0	0	0	0	0	0.001	0	0	0	0	0	0	0.0016	0.0051	1.1	0
PAB	0.19	0	0.039	0.002	0.004	0.1	0.053	0	0.003	0	0	0.014	0.05	0	0.063	0	0	2.3	0.56
PAC	0	0	0	0	0	0	0	0	0	0	0	0.001	0	0	0.1	0	0	14	0
PAD	0	0.014	0	0	0.34	0	0	0.011	0	0	0	0.16	0	0	0	0	0	10	0
PAE	0.002	0	0	0	0.02	0	0	0	0.012	0	0	0.076	0	0	0.15	0	0	0.48	0.14
PAF	0	0	0	0	0	0	0	0	0.02	0	0	0.16	0	0	0.007	0	0	0.054	0
PAG	0	0	0.004	0	0.019	0	0	0	0.02	0	0	0	0	0	0.12	0	0	2.4	1
PAH	0	0	0	0	0	0	0	0	0	0	0	0.003	0	0	0.032	0	0	1.1	2.1
PAI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0028	0	0
LSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPAA	0	0	0	0	0	0	0	0	0.074	0	0	0	0	0	0.11	0	0	0.12	0
WPA.OU1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPA.OU4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ATTACHMENT F.2-I
TABLE F.2-I-3, PAGE 2 OF 3
REPRESENTATIVE SURFACE SOIL CONCENTRATION (mg/kg) FOR ORGANICS
BASELINE CONDITIONS

	BENZENE	BENZO(A)ANTHRACENE	BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	BENZO(K)FLUORANTHENE	BENZYL ALCOHOL	BETA-BHC	BIS(2-CHLOROISOPROPYL) ETHER	BIS(2-ETHYLHEXYL)PHTHALATE	BROMODICHLOROMETHANE	BROMOMETHANE	CARBAZOLE	CARBON DISULFIDE	CHLOROFORM	CHRYSENE	DIBENZO(A,H)ANTHRACENE	DIBENZOFURAN	DIELDRIN	ENDRIN ALDEHYDE
560A	0.003	0.048	0	0.056	0.06	0	0	0	3.7	0	0	0	0	0	0.077	0	0	0.02	0
560B	0	9.2	12	15	12	0.069	0	0	11	0	0	0	0	0	12	3.5	0.4	0	0.015
560C	0	2.7	1.6	7.7	0.21	0	0	0	0.57	0	0	0	0.011	0	4.7	0.062	0	0	0
SWL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570A	0	0.077	0.054	0.12	0.056	0	0	0.044	0.694668	0	0	0	0	0	0.095	0	0	0	0
570B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570C	0	0.71	0.6	0.67	0.8	0	0	0	1	0	0	0.046	0	0	0.83	0.059	0	0	0
570D	0	0.71	0.6	0.67	0.8	0	0	0	1	0	0	0.046	0	0	0.83	0.059	0	0	0
570E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575A	0	0.067	0.061	0.066	0.077	0	0	0	0.7	0.006	0	0.007	0	0.032	0.088	0	0	0	0
575B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580A	0	0	0	0	0	0	0	0	0	0	0	0.007	0	0	0	0	0	0	0
581A	0	0	0	0	0	0	0	0	0.082	0	0	0	0	0	0	0	0	0	0
581B	0	0.59	0.94	1.8	1.3	0	0	0	0.045	0	0	0	0	0	0.59	0.4	0	0	0
581C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
581D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
582A	0	0	0	0	0	0	0	0	0.051	0	0	0	0	0	0	0	0	0	0
582B	0	0.11	0.12	0.18	0.073	0	0	0	0.15	0	0	0	0	0	0.15	0	0	0	0
AFP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAA	0	0	0	0.047	0.033	0	0	0	0.046	0	0.72	0	0	0	0	0	0	0.0024	0
PAB	0.002	2.4	3.3	0.48	3.8	0.29	0.078	0.048	7.1	0	0	0.065	0.014	0.009	0.41	1.2	0.44	0	0
PAC	0	0.29	0.22	0.37	0.3	0	0	0	0.26	0	0	0.048	0	0	0.48	0.074	0	0	0
PAD	0	0.66	0.64	0.84	0.79	0	0	0	0.12	0	0	0	0.011	0.001	0.9	0	0	0	0
PAE	0	2	2.3	2.3	2.6	0	0	0	0.78	0	0	0.57	0.004	0.014	1.9	0.61	0.36	0	0
PAF	0	1.8	1.6	2	1.5	0	0	0	0.12	0	0	0.25	0	0	2.2	0.4	0.24	0	0
PAG	0.005	6.3	6	6.1	5	0	0.22	0	0.407104	0	0	0.074	0	0	7.8	1.5	0.64	0	0
PAH	0	0.91	1.1	1	0.8	0	0	0	0.13	0	0	0.14	0.006	0.004	1.1	0.32	0.14	0	0
PAI	0	0.1	0.093	0.11	0.091	0	0	0	0.066	0	0	0	0	0	0.15	0	0	0.0089	0
LSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPAA	0	0.099	0.11	0.19	0	0	0	0	1.190042	0	0	0.076	0	0	0.1	0	2.5	0.018	0
WPA.OU1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPA.OU4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ATTACHMENT F.2-I
TABLE F.2-I-3, PAGE 3 OF 3
REPRESENTATIVE SURFACE SOIL CONCENTRATION (mg/kg) FOR ORGANICS
BASELINE CONDITIONS

	HEPTACHLOR EPOXIDE	HEPTACHLORODIBENZOFURANS	HEXACHLOROBUTADIENE	INDENO(1,2,3-CD)PYRENE	ISOPHORONE	METHYLENE CHLORIDE	N-NITROSO-DI-N-PROPYLAMINE	N-NITROSODIPHENYLAMINE	STYRENE	TETRACHLOROETHENE	TRIBUTYL PHOSPHATE	TRICHLOROETHENE
560A	0	0	0	0	0	0	0	0	0	0.002	0	0.004
560B	0	0	0	8.7	0	1.87	0.039	0	0	0	0.068	0
560C	0	0	0	0.18	0	0.22	0	0	0	0.17	0	0
SWL	0	0	0	0	0	0	0	0	0	0	0	0
560D	0	0.00032	0	0	0	0	0	0	0	0	0.22	0
570A	0	0	0	0	0	0.023	0	0	0	0	0	0
570B	0	0	0	0	0	0	0	0	0	0	0	0
570C	0	0	0	0.47	0	0.028	0	0	0	0	0.046	0
570D	0	0	0	0.47	0	0.028	0	0	0	0	0.046	0
570E	0	0	0	0	0	0	0	0	0	0	0	0
575A	0	0	0	0.05	0	0	0	0	0	0	0	0
575B	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0
580A	0	0	0	0	0	0	0	0	0	0	0	0
581A	0	0	0	0	0	0.006	0	0	0	0.001	0	0
581B	0	0	0	1.5	0	0.013	0	0	0	0	0.066	0
581C	0	0	0	0	0	0	0	0	0	0	0.066	0
581D	0	0	0	0	0	0.006	0	0	0	0	1.2	0
582A	0	0	0	0	0	0	0	0	0	0.003	0	0.002
582B	0	0	0	0.074	0	0	0	0	0	0.002	0	0
AFP	0	0	0	0	0	0	0	0	0	0	0	0
PAA	0.001	0	0	0	0	0.014	0	1.3	0.001	0.003	0.071	0
PAB	0	0.00032	0.43	3	0	0.027	0	0.12	0.028	0.14	0.22	0.052
PAC	0	0	0	0.22	0	0.036	0	0	0	0.002	1.2	0
PAD	0	0	0	0	0	0.006	0	0	0	3.3	1.2	89
PAE	0	0	0	1.7	0	0.027	0	0	0	0.02	0	0.064
PAF	0	0	0	1.3	0	0	0	0	0	0	1.2	0
PAG	0	0	0	4.8	0.83	0.005	0	0	0	0.052	1.2	0.034
PAH	0	0	0	0.72	0	0.0265	0	0	0	0	0.046	0.018
PAI	0.0028	0	0	0.079	0	0.013	0	0	0	0	0	0
LSP	0	0	0	0	0	0	0	0	0	0	0	0
WPAA	0	0	0	0.064	0	0.005	0	0	0	0	0	0.006
WPA.OU1	0	0	0	0	0	0	0	0	0	0	0	0
WPA.OU4	0	0	0	0	0	0	0	0	0	0	0	0

ATTACHMENT F.2-I
TABLE F.2-I-4, PAGE 1 OF 1
REPRESENTATIVE SOIL CONCENTRATION (mg/kg) FOR RADIONUCLIDES
FUTURE CONDITION

	ACTINIUM-227	CESIUM-137	NEPTUNIUM-237	PLUTONIUM-238	PLUTONIUM-239/240	PROTACTINIUM-231	RADIUM-226	RUTHENIUM-106	STRONTIUM-90	TECHNETIUM-99	THORIUM-230	THORIUM-232	URANIUM, TOTAL 1	URANIUM-234	URANIUM-235/236	URANIUM-238
560A	0.00E+00	2.32E-09	1.15E-03	0.00E+00	0.00E+00	0.00E+00	9.58E-07	0.00E+00	1.87E-09	7.65E-05	8.67E-05	9.29E+00	1.55E+01	6.71E-04	2.92E-01	2.32E+01
560B	0.00E+00	1.61E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.55E-06	0.00E+00	6.16E-09	9.41E-05	2.19E-04	1.34E+01	3.04E+02	5.11E-03	1.21E+00	8.69E+02
560C	0.00E+00	3.24E-09	0.00E+00	7.40E-08	4.66E-05	0.00E+00	2.26E-06	0.00E+00	5.67E-10	1.61E-03	7.33E-04	1.04E+02	1.17E+03	4.03E-02	7.87E+00	1.15E+03
swl	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	0.00E+00	5.67E-10	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
560D	0.00E+00	1.39E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.89E-03	0.00E+00	8.70E-09	0.00E+00	5.52E-02	7.36E+01	3.62E+02	5.13E-03	1.44E+00	3.60E+02
570A	0.00E+00	3.01E-09	8.47E-04	0.00E+00	0.00E+00	0.00E+00	1.70E-06	0.00E+00	1.20E-09	3.00E-04	3.40E-04	2.09E+01	7.79E+01	1.77E-03	4.17E-01	7.74E+01
570B	0.00E+00	4.65E-09	0.00E+00	1.35E-08	9.80E-06	0.00E+00	1.30E-06	4.01E-30	2.41E-09	2.82E-04	1.11E-02	6.00E+01	4.28E+02	8.68E-03	1.67E+00	4.26E+02
570C	0.00E+00	1.16E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.81E-07	0.00E+00	9.37E-10	0.00E+00	7.28E-05	7.27E+00	3.60E+01	1.90E-03	4.17E-01	3.54E+01
570D	0.00E+00	3.70E-09	2.94E-04	1.11E-07	9.64E-06	0.00E+00	1.22E-05	0.00E+00	2.27E-09	1.94E-03	2.81E-03	1.14E+02	2.77E+03	2.88E-02	1.06E+01	3.31E+03
570E	0.00E+00	2.32E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.18E-06	0.00E+00	1.47E-09	0.00E+00	4.08E-04	4.73E+01	6.35E+01	3.38E-03	6.48E-01	6.28E+01
575A	0.00E+00	1.39E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.87E-07	0.00E+00	5.67E-10	0.00E+00	6.89E-04	7.27E+00	2.40E+01	7.60E-04	1.28E-01	2.23E+01
575B	0.00E+00	2.55E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.90E-07	0.00E+00	5.67E-10	0.00E+00	8.25E-05	6.36E+00	5.88E+01	2.88E-02	1.06E+01	6.28E+01
SF	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	0.00E+00	1.29E-09	8.35E-03	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
580A	0.00E+00	1.16E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-07	0.00E+00	5.67E-10	0.00E+00	5.82E-05	7.27E+00	1.87E+01	2.09E-04	4.20E-02	5.36E+00
581A	0.00E+00	1.85E-09	0.00E+00	0.00E+00	1.45E-05	0.00E+00	1.28E-06	0.00E+00	2.05E-09	6.47E-05	8.76E-05	8.50E+00	2.13E+01	7.94E-04	3.24E-01	1.57E+01
581B	1.79E-09	1.38E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.50E-06	0.00E+00	2.26E-09	6.65E-04	1.36E-03	6.00E+01	5.63E+02	1.49E-02	6.20E+00	7.71E+02
581C	0.00E+00	2.33E-09	0.00E+00	5.05E-08	0.00E+00	0.00E+00	1.17E-06	0.00E+00	5.75E-09	0.00E+00	1.63E-04	1.27E+01	4.76E+01	2.37E-03	5.42E-01	4.70E+01
581D	5.88E-09	1.65E-09	0.00E+00	5.08E-06	2.41E-05	1.07E-04	2.71E-05	0.00E+00	4.95E-09	1.34E-02	3.91E-02	5.63E+02	7.57E+03	2.62E-01	6.71E+01	4.40E+03
582A	0.00E+00	1.85E-09	0.00E+00	0.00E+00	9.64E-06	0.00E+00	1.06E-06	0.00E+00	1.61E-09	0.00E+00	1.44E-04	1.05E+01	1.15E+01	7.44E-04	7.55E-02	1.58E+01
582B	0.00E+00	2.13E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.92E-06	0.00E+00	5.67E-10	0.00E+00	7.20E-04	1.46E+01	4.44E+02	5.61E-03	1.13E+00	4.42E+02
AFP	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	0.00E+00	5.67E-10	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
PAA	0.00E+00	1.16E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E-03	0.00E+00	4.15E-09	0.00E+00	1.33E-01	2.85E+02	1.23E+04	6.20E-01	9.44E+01	1.22E+04
PAB	0.00E+00	1.62E-09	0.00E+00	2.42E-08	1.04E-04	0.00E+00	1.89E-06	0.00E+00	4.55E-09	4.76E-04	1.11E-03	4.64E+01	7.08E+02	4.55E-02	6.94E+00	8.21E+02
PAC	0.00E+00	5.79E-10	3.73E-03	0.00E+00	1.15E-05	0.00E+00	6.77E-06	0.00E+00	2.73E-09	2.96E-04	3.62E-03	1.19E+01	9.14E+02	9.34E-02	2.94E+01	1.66E+03
PAD	0.00E+00	1.39E-09	0.00E+00	2.87E-08	0.00E+00	0.00E+00	1.18E-06	0.00E+00	1.49E-09	1.29E-04	3.98E-04	1.55E+01	4.07E+02	2.06E-02	4.02E+00	4.17E+02
PAE	0.00E+00	1.16E-09	1.01E-03	3.53E-08	2.43E-05	0.00E+00	8.20E-07	0.00E+00	5.55E-09	1.24E-02	3.98E-04	3.24E+02	6.77E+03	6.78E-01	1.23E+02	1.63E+04
PAF	5.88E-09	1.41E-09	0.00E+00	5.08E-06	0.00E+00	1.07E-04	1.24E-06	0.00E+00	2.56E-09	1.41E-04	5.00E-04	1.83E+01	2.22E+02	1.19E-02	7.04E+00	2.35E+02
PAG	0.00E+00	6.71E-09	0.00E+00	8.63E-09	2.07E-04	0.00E+00	3.41E-06	0.00E+00	5.18E-09	1.18E-03	9.99E-03	2.57E+03	4.31E+04	2.13E+00	4.40E+02	4.26E+04
PAH	0.00E+00	2.06E-09	9.58E-04	0.00E+00	0.00E+00	0.00E+00	3.15E-06	3.70E-30	2.97E-09	9.41E-05	1.06E-02	1.05E+02	9.94E+01	4.65E-03	4.37E-01	1.56E+02
PAI	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.55E-06	0.00E+00	5.67E-10	0.00E+00	7.28E-05	7.78E+00	4.17E+01	9.32E-04	9.26E-02	1.67E+01
LSP	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	0.00E+00	5.67E-10	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
WPAA	0.00E+00	1.85E-09	1.18E-03	2.35E-08	3.42E-06	0.00E+00	3.79E-05	0.00E+00	1.34E-09	3.12E-04	4.38E-04	2.31E+01	3.74E+02	2.83E-03	2.92E+00	1.02E+03
WPA.OU1	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	0.00E+00	5.67E-10	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00
WPA.OU4	0.00E+00	1.02E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	0.00E+00	5.67E-10	0.00E+00	7.26E-05	9.82E+00	3.23E+00	1.67E-04	4.20E-02	3.23E+00

ATTACHMENT F.2-I
TABLE F.2-I-5, PAGE 1 OF 3
REPRESENTATIVE SOIL CONCENTRATION (mg/kg) FOR ORGANICS
FUTURE CONDITIONS

	1,1,2,2-TETRACHLOROETHANE	1,1,2-TRICHLOROETHANE	1,1-DICHLOROETHENE	1,2-DICHLOROETHANE	1,2-DICHLOROETHENE (TOTAL)	2,4-DICHLOROPHENOL	2,4-DINITROTOLUENE	2,6-DINITROTOLUENE	2-BUTANONE	2-CHLOROPHENOL	3,3'-DICHLOROBENZIDINE	4-METHYL-2-PENTANONE	4-METHYLPHENOL	4-NITROANILINE	ACETONE	ALDRIN	ALPHA-CHLORDANE	AROCLOR-1254	AROCLOR-1260
560A	0	0	0	0	0	0	0	0	0	0	0	9.1E-278	0	0	2E-278	0	0	0	0
560B	0	0	0	0	0	0	0	0	0	0.048	1.57E-22	6.5E-279	0	0.33	0	0	0	2.1	0
560C	0	0	0	0	0	0	0	0	8.5E-278	0	0	0	0.061	0	0	0	0	0.045	1.3
SWL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.12	0
570C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.24	0
570D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.24	0
570E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575A	0	0	0	0	0	0	0	0	0	0	0	0	0.19	0	1.4E-277	0	0	0	0
575B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0																	
580A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
581A	0	0	1.72E-13	0	0	0	0	0	6.5E-279	0	0	0	0	0	7.2E-278	0	0	0.2	0
581B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.8E-278	0	0	0.12	0
581C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
581D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
582A	0	0	0	0	0	0	0	0	1.3E-278	0	0	0	1.7	0	0	0	0	0	0
582B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4E-277	0	0	0	0
AFP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAA	0	0	0	0	0	0	0	0	6.5E-279	0	0	0	0	0	0	4.21E-10	0.0051	1.1	0
PAB	1.68E-43	0	1.12E-12	5.75E-14	1.15E-13	1.3E-180	4.38E-23	0	2E-278	0	0	9.1E-278	0.05	0	4.1E-277	0	0	2.3	0.56
PAC	0	0	0	0	0	0	0	0	0	0	0	6.5E-279	0	0	6.5E-277	0	0	14	0
PAD	0	8.53E-08	0	0	9.77E-12	0	0	9.09E-24	0	0	0	1E-276	0	0	0	0	0	10	0
PAE	1.76E-45	0	0	0	5.75E-13	0	0	0	7.8E-278	0	0	4.9E-277	0	0	9.8E-277	0	0	0.46	0.14
PAF	0	0	0	0	0	0	0	0	1.3E-277	0	0	1E-276	0	0	4.6E-278	0	0	0.054	0
PAG	0	0	1.15E-13	0	5.46E-13	0	0	0	1.3E-277	0	0	0	0	0	7.8E-277	0	0	2.4	1
PAH	0	0	0	0	0	0	0	0	0	0	0	2E-278	0	0	2.1E-277	0	0	1.1	2.1
PAI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0028	0	0
LSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPAA	0	0	0	0	0	0	0	0	4.8E-277	0	0	0	0	0	7.2E-277	0	0	0.12	0
WPA.OU1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPA.OU4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ATTACHMENT F.2-I
TABLE F.2-I-5, PAGE 2 OF 3
REPRESENTATIVE SOIL CONCENTRATION (mg/kg) FOR ORGANICS
FUTURE CONDITIONS

	BENZENE	BENZO(A)ANTHRACENE	BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	BENZO(K)FLUORANTHENE	BENZYL ALCOHOL	BETA-BHC	BIS(2-CHLOROISOPROPYL) ETHER	BIS(2-ETHYLHEXYL)PHTHALATE	BROMODICHLOROMETHANE	BROMOMETHANE	CARBAZOLE	CARBON DISULFIDE	CHLOROFORM	CHRYSENE	DIBENZO(A,H)ANTHRACENE	DIBENZOFURAN	DIELDRIN	ENDRIN ALDEHYDE
560A	8.62E-14	8.08E-05	0	4.38E-05	0.007771	0	0	0	6.25E-20	0	0	0	0	0	0.001	0	0	6.15E-06	0
560B	0	0.015479	0.020189	0.011726	1.554116	0.069	0	0	1.86E-19	0	0	0	0	0	0.155892	0.035217	8.25E-70	0	0.015
560C	0	0.004543	0.002692	0.006019	0.027197	0	0	0	9.64E-21	0	0	0	0.011	0	0.061058	0.000624	0	0	0
SWL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
560D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570A	0	0.00013	9.09E-05	9.38E-05	0.007253	0	0	0.044	1.17E-20	0	0	0	0	0	0.001234	0	0	0	0
570B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
570C	0	0.001195	0.001009	0.000524	0.103608	0	0	0	1.69E-20	0	0	0.046	0	0	0.010783	0.000594	0	0	0
570D	0	0.001195	0.001009	0.000524	0.103608	0	0	0	1.69E-20	0	0	0.046	0	0	0.010783	0.000594	0	0	0
570E	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575A	0	0.000113	0.000103	5.16E-05	0.009972	0	0	0	1.18E-20	0.006	0	0.007	0	2.82E-44	0.001143	0	0	0	0
575B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
580A	0	0	0	0	0	0	0	0	0	0	0	0.007	0	0	0	0	0	0	0
581A	0	0	0	0	0	0	0	0	1.05E-21	0	0	0	0	0	0	0	0	0	0
581B	0	0.000993	0.001582	0.001407	0.168363	0	0	0	7.61E-22	0	0	0	0	0	0.007665	0.004025	0	0	0
581C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
581D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
582A	0	0	0	0	0	0	0	0	8.62E-22	0	0	0	0	0	0	0	0	0	0
582B	0	0.000185	0.000202	0.000141	0.009454	0	0	0	2.54E-21	0	0	0	0	0	0.001949	0	0	0	0
AFP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PAA	0	0	0	3.67E-05	0.004274	0	0	0	7.78E-22	0	0.72	0	0	0	0	0	0	7.38E-07	0
PAB	5.75E-14	0.004038	0.005552	0.000375	0.492137	0.29	7.55E-33	0.048	1.2E-19	0	0	0.065	0.014	7.94E-45	0.005326	0.012074	9.07E-70	0	0
PAC	0	0.000488	0.00037	0.000289	0.038853	0	0	0	4.39E-21	0	0	0.048	0	0	0.006236	0.000745	0	0	0
PAD	0	0.00111	0.001077	0.000657	0.102313	0	0	0	2.03E-21	0	0	0	0.011	8.82E-46	0.011692	0	0	0	0
PAE	0	0.003365	0.00387	0.001798	0.338725	0	0	0	1.32E-20	0	0	0.57	0.004	1.23E-44	0.024683	0.006138	7.42E-70	0	0
PAF	0	0.003028	0.002692	0.001563	0.194264	0	0	0	2.03E-21	0	0	0.25	0	0	0.02858	0.004025	4.95E-70	0	0
PAG	1.44E-13	0.010599	0.010095	0.004769	0.647548	0	2.13E-32	0	6.88E-21	0	0	0.074	0	0	0.10133	0.015093	1.32E-69	0	0
PAH	0	0.001531	0.001851	0.000782	0.103608	0	0	0	2.2E-21	0	0	0.14	0.006	3.53E-45	0.01429	0.00322	2.89E-70	0	0
PAI	0	0.000168	0.000156	8.6E-05	0.011785	0	0	0	1.12E-21	0	0	0	0	0	0.001949	0	0	2.74E-06	0
LSP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPAA	0	0.000167	0.000185	0.000149	0	0	0	0	2.01E-20	0	0	0.076	0	0	0.001299	0	5.16E-69	5.54E-06	0
WPA.OU1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WPA.OU4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ATTACHMENT F.2-I
TABLE F.2-I-5, PAGE 3 OF 3
REPRESENTATIVE SOIL CONCENTRATION (mg/kg) FOR ORGANICS
FUTURE CONDITIONS

	HEPTACHLOR EPOXIDE	HEPTACHLORODIBENZOFURANS	HEXACHLOROBUTADIENE	INDENO(1,2,3-CD)PYRENE	ISOPHORONE	METHYLENE CHLORIDE	N-NITROSO-DI-N-PROPYLAMINE	N-NITROSODIPHENYLAMINE	STYRENE	TETRACHLOROETHENE	TRIBUTYL PHOSPHATE	TRICHLOROETHENE
560A	0	0	0	0	0	0	0	0	0	4.37E-08	0	8.74E-08
560B	0	0	0	0.018898	0	1.2E-275	3.22E-23	0	0	0	0.066	0
560C	0	0	0	0.000391	0	1.4E-276	0	0	0	3.72E-06	0	0
SWL	0	0	0	0	0	0	0	0	0	0	0	0
560D	0	6.6E-73	0	0	0	0	0	0	0	0	0.22	0
570A	0	0	0	0	0	1.5E-277	0	0	0	0	0	0
570B	0	0	0	0	0	0	0	0	0	0	0	0
570C	0	0	0	0.001021	0	1.8E-277	0	0	0	0	0.046	0
570D	0	0	0	0.001021	0	1.8E-277	0	0	0	0	0.046	0
570E	0	0	0	0	0	0	0	0	0	0	0	0
575A	0	0	0	0.000109	0	0	0	0	0	0	0	0
575B	0	0	0	0	0	0	0	0	0	0	0	0
SF	0	0	0	0	0	0	0	0	0	0	0	0
580A	0	0	0	0	0	0	0	0	0	0	0	0
581A	0	0	0	0	0	3.9E-278	0	0	0	2.19E-08	0	0
581B	0	0	0	0.003258	0	8.5E-278	0	0	0	0	0.066	0
581C	0	0	0	0	0	0	0	0	0	0	0.066	0
581D	0	0	0	0	0	3.9E-278	0	0	0	0	1.2	0
582A	0	0	0	0	0	0	0	0	0	6.56E-08	0	4.37E-08
582B	0	0	0	0.000161	0	0	0	0	0	4.37E-08	0	0
AFP	0	0	0	0	0	0	0	0	0	0	0	0
PAA	1.08E-10	0	0	0	0	9.1E-278	0	1.1E-113	2.41E-40	6.56E-08	0.071	0
PAB	0	6.6E-73	3.65E-22	0.006517	0	1.8E-277	0	1E-114	6.75E-39	3.06E-06	0.22	1.14E-06
PAC	0	0	0	0.000478	0	2.3E-277	0	0	0	4.37E-08	1.2	0
PAD	0	0	0	0	0	3.9E-278	0	0	0	7.21E-05	1.2	0.001945
PAE	0	0	0	0.003893	0	1.8E-277	0	0	0	4.37E-07	0	1.4E-06
PAF	0	0	0	0.002824	0	0	0	0	0	0	1.2	0
PAG	0	0	0	0.010427	2.1E-138	3.3E-278	0	0	0	1.14E-06	1.2	7.43E-07
PAH	0	0	0	0.001564	0	1.7E-277	0	0	0	0	0.046	3.93E-07
PAI	3.03E-10	0	0	0.000172	0	8.5E-278	0	0	0	0	0	0
LSP	0	0	0	0	0	0	0	0	0	0	0	0
WPAA	0	0	0	0.000139	0	3.3E-278	0	0	0	0	0	1.31E-07
WPA.OU1	0	0	0	0	0	0	0	0	0	0	0	0
WPA.OU4	0	0	0	0	0	0	0	0	0	0	0	0

F.2.II Attachment

Attachment F.2.II

Surface Water Model Outputs
Baseline Condition

PADDYS RUN BASIN | **CHEMICAL:** ACTINIUM-227 +7D | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 9:52

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	6.44E-14	8.19E-10	4.49E+05	9.06E-01	5.84E-14
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	3.36E-14	8.19E-10	2.20E-09

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	1.96E-11	1.28E-09
Max:	1.96E-11	1.28E-09

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	2.81E-12
Avg. Conc. in GMR	2.82E-13
Max. Conc. in Paddys Run at GMR	1.62E-11
Max. Conc. in GMR at Paddys Run	1.62E-12
Max. Conc. in GMR at Eff. Line (max week)	1.49E-12
Annual Conc. at Eff. Line	1.07E-13

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	1.23E-11	1.35E-14	1.39E-12
SSOD				56.6	4.64E-10	5.08E-13	2.75E-11
TOTAL					4.76E-10		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	3.43E-10	4.18E-15	2.06E-15
SSOD	1.29E-08	1.58E-13	7.77E-14
TOTAL	1.33E-08	1.62E-13	7.97E-14

CPC SCREENING | **ACTINIUM-227 +7D RISK CRITERIA :** 1.93E-10 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	6.44E-14	YES	2.75E-11	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: ACTINIUM-227 +7D BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.58E-09	4.21E-09	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.84E-08	3.66E-07	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	9.34E-08	6.08E-06	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.23E-14	6.44E-14	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.04E-09	8.19E-10	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.44E-09	1.36E-08	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.73E-08	1.36E-08	0.00E+00

PADDYS RUN BASIN | CHEMICAL: CESIUM-137 +1D | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: | Investigator DCW | Date 5/22/94 12:18

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.08E-13	1.00E-09	1.70E+05	2.00E-01	4.16E-14
Sub570	2.83E-13	1.59E-09	1.99E+05	9.68E-01	2.74E-13
Sub575	1.31E-13	4.55E-10	1.23E+05	2.62E-01	3.43E-14
Sub580	1.01E-13	1.24E-10	4.34E+04	1.28E-01	1.29E-14
Sub581	1.80E-13	2.29E-09	4.49E+05	9.06E-01	1.63E-13
Sub582	1.85E-13	1.93E-09	3.68E+05	4.35E-01	8.04E-14

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.08E-13	1.00E-09	1.09E-08
Sub570	2.83E-13	1.59E-09	1.59E-08
sub575	1.31E-13	4.55E-10	7.01E-09
Sub 580, 581 & 582	1.78E-13	4.34E-09	8.87E-09

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.75E-10	1.55E-08
D-D	2.75E-10	1.55E-08
E-E	2.75E-10	1.55E-08
Max:	2.75E-10	1.55E-08

Great Miami River

	ug/l
Avg. Conc. in Paddys Run at GMR	2.53E-11
Avg. Conc. in GMR	2.54E-12
Max. Conc. in Paddys Run at GMR	2.27E-10
Max. Conc. in GMR at Paddys Run	2.28E-11
Max. Conc. in GMR at Eff. Line (max week)	5.03E-12
Annual Conc. at Eff. Line	4.85E-13

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.08E-10	6.66E-13	4.95E-11
D-E	7.5	11.1	13.9		3.15E-10	3.45E-13	3.06E-11
E-F	0.7	1.6	1.1	1.5	1.03E-10	1.12E-13	1.16E-11
SSOD				56.6	2.46E-09	2.69E-12	1.46E-10
TOTAL					3.48E-09		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.76E-08	5.79E-13	2.86E-13
D-E	2.53E-08	3.08E-13	1.52E-13
E-F	5.07E-09	6.17E-14	3.04E-14
SSOD	8.58E-08	1.04E-12	5.15E-13
TOTAL	1.64E-07	1.99E-12	9.83E-13

CPC SCREENING | CESIUM-137 +1D RISK CRITERIA : 1.97E-09 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.08E-13	YES	5.29E-11	YES	Sub580	1.01E-13	YES	1.01E-10	YES
Sub570	2.83E-13	YES	5.29E-11	YES	Sub581	1.80E-13	YES	1.46E-10	YES
Sub575	1.31E-13	YES	5.29E-11	YES	Sub582	1.85E-13	YES	1.46E-10	YES

CHEMICAL: CESIUM-137 +1D BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.09E-08	6.77E-09	1.59E-08	7.01E-09
Single storm adsorbed contaminant quantity PXi (g):	1.02E-07	2.85E-08	7.06E-08	1.56E-08
Annual adsorbed contaminant quantity (g):	4.41E-06	2.16E-07	6.34E-07	2.60E-07
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.08E-13	1.32E-13	2.83E-13	1.31E-13
Single storm dissolved contaminant quantity PQi (g):	1.00E-09	4.48E-10	1.59E-09	4.55E-10
Annual dis. conta. qt (based on sediment yield)(g):	4.33E-08	3.40E-09	1.43E-08	7.61E-09
Annual dis. conta. qt (based on runoff) (g):	1.63E-08	7.47E-09	2.67E-08	7.61E-09

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.78E-09	8.50E-09	8.87E-09	9.24E-09
Single storm adsorbed contaminant quantity PXi (g):	2.95E-08	6.74E-08	7.71E-07	8.83E-08
Annual adsorbed contaminant quantity (g):	4.58E-07	2.22E-07	1.28E-05	2.28E-06
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.01E-13	1.65E-13	1.80E-13	1.85E-13
Single storm dissolved contaminant quantity PQi (g):	1.24E-10	3.29E-09	2.29E-09	1.93E-09
Annual dis. conta. qt (based on sediment yield)(g):	1.93E-09	1.08E-08	3.81E-08	4.97E-08
Annual dis. conta. qt (based on runoff) (g):	2.03E-09	5.46E-08	3.81E-08	3.30E-08

PADDYS RUN BASIN | **CHEMICAL:** NEPTUNIUM-237 +1D | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/22/94 12:20

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.69E-07	2.74E-03	1.70E+05	2.00E-01	1.14E-07
Sub570	2.66E-07	1.50E-03	1.99E+05	9.68E-01	2.58E-07
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.69E-07	2.74E-03	9.07E-04
Sub570	2.66E-07	1.50E-03	4.55E-04
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.61E-04	4.46E-04
D-D	2.61E-04	4.46E-04
E-E	2.61E-04	4.46E-04
Max:	2.61E-04	4.46E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.45E-05
Avg. Conc. in GMR	1.46E-06
Max. Conc. in Paddys Run at GMR	2.16E-04
Max. Conc. in GMR at Paddys Run	2.17E-05
Max. Conc. in GMR at Eff. Line (max week)	7.94E-07
Annual Conc. at Eff. Line	1.72E-07

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.43E-04	1.03E-06	7.69E-05
D-E	7.5	11.1	13.9		3.72E-04	4.08E-07	3.61E-05
E-F	0.7	1.6	1.1	1.5	4.32E-05	4.73E-08	4.68E-06
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.36E-03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	9.96E-02	1.21E-06	5.98E-07
D-E	3.75E-02	4.56E-07	2.25E-07
E-F	4.00E-03	4.87E-08	2.40E-08
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.41E-01	1.72E-06	8.47E-07

CPC SCREENING | **NEPTUNIUM-237 +1D RISK CRITERIA :** 3.12E-05 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.69E-07	NO	7.36E-05	NO	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	2.66E-07	NO	7.36E-05	NO	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: NEPTUNIUM-237 +1D BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	9.07E-04	4.75E-04	4.55E-04	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	8.49E-03	2.00E-03	2.02E-03	0.00E+00
Annual adsorbed contaminant quantity (g):	3.68E-01	1.52E-02	1.81E-02	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.69E-07	3.05E-07	2.66E-07	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.74E-03	1.04E-03	1.50E-03	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.19E-01	7.85E-03	1.35E-02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.48E-02	1.73E-02	2.51E-02	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.13E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.86E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.60E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.91E-07	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	7.81E-03	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.57E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.30E-01	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: PLUTONIUM-238 | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/22/94 12:22

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.30E-14	1.59E-10	1.70E+05	2.00E-01	6.59E-15
Sub570	6.45E-13	3.64E-09	1.99E+05	9.68E-01	6.25E-13
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.21E-12	2.81E-08	4.49E+05	9.06E-01	2.01E-12
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	3.30E-14	1.59E-10	1.62E-09
Sub570	6.45E-13	3.64E-09	3.41E-08
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	1.16E-12	2.81E-08	5.34E-08

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	6.25E-10	3.30E-08
D-D	6.25E-10	3.30E-08
E-E	9.38E-10	4.51E-08
Max:	9.38E-10	4.51E-08

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.09E-10
Avg. Conc. in GMR	1.10E-11
Max. Conc. in Paddys Run at GMR	7.75E-10
Max. Conc. in GMR at Paddys Run	7.78E-11
Max. Conc. in GMR at Eff. Line (max week)	2.54E-10
Annual Conc. at Eff. Line	1.95E-11

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.49E-10	1.04E-12	7.74E-11
D-E	7.5	11.1	13.9		4.16E-10	4.55E-13	4.03E-11
E-F	0.7	1.6	1.1	1.5	4.81E-10	5.28E-13	5.44E-11
SSOD				56.6	1.59E-08	1.75E-11	9.45E-10
TOTAL					1.78E-08		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.39E-08	5.34E-13	2.63E-13
D-E	1.90E-08	2.31E-13	1.14E-13
E-F	1.48E-08	1.80E-13	8.86E-14
SSOD	4.44E-07	5.41E-12	2.67E-12
TOTAL	5.22E-07	6.36E-12	3.13E-12

CPC SCREENING PLUTONIUM-238 RISK CRITERIA : 1.29E-09 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.30E-14	YES	3.30E-11	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	6.45E-13	YES	7.41E-11	YES	Sub581	2.21E-12	NO	9.45E-10	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: PLUTONIUM-238 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.62E-09	1.65E-08	3.41E-08	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.52E-08	6.94E-08	1.51E-07	0.00E+00
Annual adsorbed contaminant quantity (g):	6.58E-07	5.27E-07	1.36E-06	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.30E-14	3.42E-13	6.45E-13	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.59E-10	1.16E-09	3.64E-09	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	6.87E-09	8.82E-09	3.27E-08	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.59E-09	1.94E-08	6.10E-08	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.94E-07	1.02E-07	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.71E-06	8.90E-06	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.55E-05	1.48E-04	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.22E-11	2.21E-12	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.45E-07	2.81E-08	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	8.06E-07	4.68E-07	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	4.06E-06	4.68E-07	0.00E+00

PADDYS RUN BASIN | CHEMICAL: PLUTONIUM-239/240 | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/22/94 12:24

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.20E-11	5.76E-08	1.70E+05	2.00E-01	2.39E-12
Sub570	5.69E-11	3.21E-07	1.99E+05	9.68E-01	5.51E-11
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.28E-10	2.89E-06	4.49E+05	9.06E-01	2.06E-10
Sub582	2.02E-10	2.11E-06	3.68E+05	4.35E-01	8.81E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.20E-11	5.76E-08	5.89E-07
Sub570	5.69E-11	3.21E-07	3.00E-06
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	2.05E-10	5.00E-06	9.56E-06

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.51E-08	2.91E-06
D-D	5.51E-08	2.91E-06
E-E	1.43E-07	6.80E-06
Max:	1.43E-07	6.80E-06

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.84E-08
Avg. Conc. in GMR	1.85E-09
Max. Conc. in Paddys Run at GMR	1.18E-07
Max. Conc. in GMR at Paddys Run	1.19E-08
Max. Conc. in GMR at Eff. Line (max week)	1.21E-08
Annual Conc. at Eff. Line	9.41E-10

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.27E-08	1.02E-10	7.55E-09
D-E	7.5	11.1	13.9		3.99E-08	4.37E-11	3.87E-09
E-F	0.7	1.6	1.1	1.5	8.06E-08	8.83E-11	9.10E-09
SSOD				56.6	2.83E-06	3.10E-09	1.68E-07
TOTAL					3.05E-06		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.19E-06	6.32E-11	3.12E-11
D-E	2.15E-06	2.62E-11	1.29E-11
E-F	2.90E-06	3.53E-11	1.74E-11
SSOD	9.79E-05	1.19E-09	5.88E-10
TOTAL	1.08E-04	1.32E-09	6.50E-10

CPC SCREENING | PLUTONIUM-239/240 RISK CRITERIA : 3.38E-07 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.20E-11	YES	7.24E-09	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	5.69E-11	YES	7.24E-09	YES	Sub581	2.28E-10	YES	1.68E-07	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	2.02E-10	YES	1.68E-07	YES

CHEMICAL: PLUTONIUM-239/240 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.89E-07	1.38E-06	3.00E-06	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	5.51E-06	5.82E-06	1.33E-05	0.00E+00
Annual adsorbed contaminant quantity (g):	2.39E-04	4.41E-05	1.20E-04	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.20E-11	2.86E-11	5.69E-11	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	5.76E-08	9.73E-08	3.21E-07	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.49E-06	7.39E-07	2.88E-06	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	9.41E-07	1.62E-06	5.37E-06	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.81E-05	1.05E-05	9.50E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.23E-04	9.15E-04	9.09E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	7.34E-04	1.52E-02	2.35E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.79E-10	2.28E-10	2.02E-10
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.16E-05	2.89E-06	2.11E-06
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.82E-05	4.81E-05	5.45E-05
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.92E-04	4.81E-05	3.61E-05

PADDYS RUN BASIN | CHEMICAL: PROTACTINIUM-231 | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 5/23/94 9:54

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.59E-11	2.03E-07	4.49E+05	9.06E-01	1.44E-11
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	8.32E-12	2.03E-07	6.11E-07

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	4.84E-09	3.56E-07
Max:	4.84E-09	3.56E-07

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	6.94E-10
Avg. Conc. in GMR	6.96E-11
Max. Conc. in Paddys Run at GMR	4.00E-09
Max. Conc. in GMR at Paddys Run	4.01E-10
Max. Conc. in GMR at Eff. Line (max week)	2.89E-09
Annual Conc. at Eff. Line	2.06E-10

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per call (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	3.04E-09	3.33E-12	3.43E-10
SSOD				56.6	1.15E-07	1.26E-10	6.81E-09
TOTAL					1.18E-07		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	8.48E-08	1.03E-12	5.09E-13
SSOD	3.20E-06	3.90E-11	1.92E-11
TOTAL	3.28E-06	4.00E-11	1.97E-11

CPC SCREENING | PROTACTINIUM-231 RISK CRITERIA : 1.10E-06 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	1.59E-11	YES	6.81E-09	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: PROTACTINIUM-231 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	7.00E-06	1.17E-06	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.55E-05	1.02E-04	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.83E-04	1.69E-03	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.09E-11	1.59E-11	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.82E-06	2.03E-07	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.99E-06	3.37E-06	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.01E-05	3.37E-06	0.00E+00

PADDYS RUN BASIN | CHEMICAL: RADIUM-226 + SD | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/22/94 12:27

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.92E-09	9.25E-06	1.70E+05	2.00E-01	3.84E-10
Sub570	1.52E-10	8.55E-07	1.99E+05	9.68E-01	1.47E-10
Sub575	3.79E-11	1.32E-07	1.23E+05	2.62E-01	9.93E-12
Sub580	1.38E-11	1.69E-08	4.34E+04	1.28E-01	1.76E-12
Sub581	1.34E-10	1.71E-06	4.49E+05	9.06E-01	1.22E-10
Sub582	5.73E-11	5.97E-07	3.68E+05	4.35E-01	2.49E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	1.92E-09	9.25E-06	3.87E-05
Sub570	1.52E-10	8.55E-07	3.28E-06
sub575	3.79E-11	1.32E-07	7.82E-07
Sub 580, 581 & 582	9.53E-11	2.32E-06	1.81E-06

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	3.84E-07	7.75E-06
D-D	3.84E-07	7.75E-06
E-E	3.84E-07	7.75E-06
Max:	3.84E-07	7.75E-06

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	4.30E-08
Avg. Conc. in GMR	4.31E-09
Max. Conc. in Paddys Run at GMR	3.17E-07
Max. Conc. in GMR at Paddys Run	3.18E-08
Max. Conc. in GMR at Eff. Line (max week)	1.01E-07
Annual Conc. at Eff. Line	9.53E-09

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.12E-06	2.32E-09	1.73E-07
D-E	7.5	11.1	13.9		8.07E-07	8.84E-10	7.83E-08
E-F	0.7	1.6	1.1	1.5	1.15E-07	1.26E-10	1.30E-08
SSOD				56.6	1.31E-06	1.44E-09	7.80E-08
TOTAL					4.36E-06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.91E-04	3.54E-09	1.75E-09
D-E	1.09E-04	1.32E-09	6.52E-10
E-F	1.15E-05	1.40E-10	6.90E-11
SSOD	4.20E-05	5.12E-10	2.52E-10
TOTAL	4.53E-04	5.51E-09	2.72E-09

CPC SCREENING RADIUM-226 + SD RISK CRITERIA : 5.96E-09 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.92E-09	NO	1.67E-07	NO	Sub580	1.38E-11	NO	1.38E-08	NO
Sub570	1.52E-10	NO	1.52E-07	NO	Sub581	1.34E-10	NO	7.80E-08	NO
Sub575	3.79E-11	NO	3.79E-08	NO	Sub582	5.73E-11	NO	5.73E-08	NO

CHEMICAL: RADIUM-226 + 8D BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.87E-05	1.65E-05	3.28E-06	7.82E-07
Single storm adsorbed contaminant quantity PXi (g):	3.63E-04	6.93E-05	1.46E-05	1.74E-06
Annual adsorbed contaminant quantity (g):	1.57E-02	5.26E-04	1.31E-04	2.90E-05
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.92E-09	8.34E-10	1.52E-10	3.79E-11
Single storm dissolved contaminant quantity PQi (g):	9.25E-06	2.83E-06	8.55E-07	1.32E-07
Annual dis. conta. qt (based on sediment yield)(g):	4.00E-04	2.15E-05	7.68E-06	2.21E-06
Annual dis. conta. qt (based on runoff) (g):	1.51E-04	4.72E-05	1.43E-05	2.21E-06

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.03E-07	2.17E-04	2.54E-06	1.10E-06
Single storm adsorbed contaminant quantity PXi (g):	1.55E-06	1.72E-03	2.21E-04	1.05E-05
Annual adsorbed contaminant quantity (g):	2.41E-05	5.65E-03	3.68E-03	2.72E-04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.38E-11	1.09E-08	1.34E-10	5.73E-11
Single storm dissolved contaminant quantity PQi (g):	1.69E-08	2.18E-04	1.71E-06	5.97E-07
Annual dis. conta. qt (based on sediment yield)(g):	2.63E-07	7.18E-04	2.84E-05	1.54E-05
Annual dis. conta. qt (based on runoff) (g):	2.78E-07	3.62E-03	2.84E-05	1.02E-05

PADDYS RUN BASIN | CHEMICAL: RUTHENIUM-106 | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 19:33

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	1.90E-14	1.07E-10	1.99E+05	9.68E-01	1.84E-14
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	1.90E-14	1.07E-10	4.71E-10
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.83E-11	4.56E-10
D-D	1.83E-11	4.56E-10
E-E	1.83E-11	4.56E-10
Max:	1.83E-11	4.56E-10

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	3.66E-13
Avg. Conc. in GMR	3.67E-14
Max. Conc. in Paddys Run at GMR	1.52E-11
Max. Conc. in GMR at Paddys Run	1.52E-12
Max. Conc. in GMR at Eff. Line (max week)	4.18E-13
Annual Conc. at Eff. Line	3.76E-14
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.76E-10
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.78E-11

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.69E-11	2.95E-14	2.19E-12
D-E	7.5	11.1	13.9		1.19E-11	1.30E-14	1.15E-12
E-F	0.7	1.6	1.1	1.5	1.71E-12	1.87E-15	1.93E-13
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					4.05E-11		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.15E-09	1.40E-14	6.88E-15
D-E	5.05E-10	6.15E-15	3.03E-15
E-F	8.26E-11	1.01E-15	4.96E-16
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.73E-09	2.11E-14	1.04E-14

CPC SCREENING | RUTHENIUM-106 RISK CRITERIA : 1.49E-10 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	1.90E-14	YES	2.10E-12	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: RUTHENIUM-106 Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	4.71E-10	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	2.09E-09	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	1.88E-08	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	1.90E-14	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	1.07E-10	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	9.60E-10	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	1.79E-09	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	9.39E-10	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	7.44E-09	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.45E-08	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.12E-14	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	8.23E-10	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.71E-09	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.36E-08	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** *STRONTIUM-90 +1D* | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date. 5/22/94 12:29

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.99E-11	2.40E-07	1.70E+05	2.00E-01	9.98E-12
Sub570	2.76E-11	1.55E-07	1.99E+05	9.68E-01	2.67E-11
Sub575	1.25E-11	4.34E-08	1.23E+05	2.62E-01	3.27E-12
Sub580	9.63E-12	1.18E-08	4.34E+04	1.28E-01	1.23E-12
Sub581	4.66E-11	5.93E-07	4.49E+05	9.06E-01	4.22E-11
Sub582	3.09E-11	3.22E-07	3.68E+05	4.35E-01	1.34E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.99E-11	2.40E-07	1.45E-08
Sub570	2.76E-11	1.55E-07	8.56E-09
sub575	1.25E-11	4.34E-08	3.70E-09
Sub 580, 581 & 582	3.80E-11	9.26E-07	1.04E-08

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.70E-08	8.37E-09
D-D	2.70E-08	8.37E-09
E-E	3.36E-08	9.63E-09
Max	3.36E-08	9.63E-09

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	4.67E-09
Avg. Conc. in GMR	4.69E-10
Max. Conc. in Paddys Run at GMR	2.78E-08
Max. Conc. in GMR at Paddys Run	2.79E-09
Max. Conc. in GMR at Eff. Line (max week)	7.15E-11
Annual Conc. at Eff. Line	2.08E-11

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			8.86E-08	9.71E-11	7.23E-09
D-E	7.5	11.1	13.9		4.13E-08	4.53E-11	4.01E-09
E-F	0.7	1.6	1.1	1.5	1.85E-08	2.03E-11	2.09E-09
SSOD				56.6	5.24E-07	5.75E-10	3.11E-08
TOTAL					6.73E-07		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	8.98E-06	1.09E-10	5.39E-11
D-E	4.04E-06	4.92E-11	2.42E-11
E-F	8.84E-07	1.08E-11	5.30E-12
SSOD	1.75E-05	2.13E-10	1.05E-10
TOTAL	3.14E-05	3.83E-10	1.89E-10

CPC SCREENING — **STRONTIUM-90 +1D RISK CRITERIA :** 9.49E-10 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.99E-11	NO	7.45E-09	NO	Sub580	9.63E-12	NO	9.63E-09	NO
Sub570	2.76E-11	NO	7.45E-09	NO	Sub581	4.66E-11	NO	3.11E-08	NO
Sub575	1.25E-11	NO	7.45E-09	NO	Sub582	3.09E-11	NO	3.09E-08	NO

CHEMICAL: STRONTIUM-90 +1D BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.45E-08	4.72E-09	8.56E-09	3.70E-09
Single storm adsorbed contaminant quantity PXi (g):	1.35E-07	1.99E-08	3.80E-08	8.20E-09
Annual adsorbed contaminant quantity (g):	5.86E-06	1.51E-07	3.42E-07	1.37E-07
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.99E-11	1.66E-11	2.76E-11	1.25E-11
Single storm dissolved contaminant quantity PQi (g):	2.40E-07	5.65E-08	1.55E-07	4.34E-08
Annual dis. conta. qt (based on sediment yield)(g):	1.04E-05	4.29E-07	1.39E-06	7.26E-07
Annual dis. conta. qt (based on runoff) (g):	3.92E-06	9.43E-07	2.60E-06	7.26E-07

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.05E-09	1.72E-08	1.27E-08	8.53E-09
Single storm adsorbed contaminant quantity PXi (g):	1.55E-08	1.36E-07	1.10E-06	8.16E-08
Annual adsorbed contaminant quantity (g):	2.42E-07	4.48E-07	1.83E-05	2.11E-06
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.63E-12	6.02E-11	4.66E-11	3.09E-11
Single storm dissolved contaminant quantity PQi (g):	1.18E-08	1.20E-06	5.93E-07	3.22E-07
Annual dis. conta. qt (based on sediment yield)(g):	1.84E-07	3.96E-06	9.86E-06	8.32E-06
Annual dis. conta. qt (based on runoff) (g):	1.94E-07	2.00E-05	9.85E-06	5.52E-06

PADDYS RUN BASIN | **CHEMICAL:** TECHNETIUM-99 | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/22/94 12:31

Subbasin	Cs Dissolved Conc. (mg/l)	PQI Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.25E-05	6.00E-02	1.70E+05	2.00E-01	2.49E-06
Sub570	5.94E-05	3.35E-01	1.99E+05	9.68E-01	5.75E-05
Sub575	1.72E-04	6.00E-01	1.23E+05	2.62E-01	4.51E-05
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	4.53E-05	5.76E-01	4.49E+05	9.06E-01	4.11E-05
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.25E-05	6.00E-02	4.26E-05
Sub570	5.94E-05	3.35E-01	2.18E-04
sub575	1.72E-04	6.00E-01	6.03E-04
Sub 580, 581 & 582	2.37E-05	5.76E-01	7.59E-05

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(ug/kg)
C-C	5.75E-02	2.11E-04
D-D	6.03E-02	2.13E-04
E-E	6.03E-02	2.13E-04
Max:	6.03E-02	2.13E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	5.38E-03
Avg. Conc. in GMR	5.40E-04
Max. Conc. in Paddys Run at GMR	4.98E-02
Max. Conc. in GMR at Paddys Run	5.00E-03
Max. Conc. in GMR at Eff. Line (max week)	1.70E-04
Annual Conc. at Eff. Line	5.40E-05

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.67E-02	1.06E-04	7.88E-03
D-E	7.5	11.1	13.9		1.25E-01	1.37E-04	1.21E-02
E-F	0.7	1.6	1.1	1.5	2.10E-02	2.30E-05	2.37E-03
SSOD				56.6	3.26E-01	3.57E-04	1.94E-02
TOTAL					5.69E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.42E+00	6.60E-05	3.25E-05
D-E	1.11E+01	1.35E-04	6.65E-05
E-F	1.26E+00	1.53E-05	7.57E-06
SSOD	9.10E+00	1.11E-04	5.46E-05
TOTAL	2.69E+01	3.27E-04	1.61E-04

CPC SCREENING | **TECHNETIUM-99 RISK CRITERIA :** 2.18E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.25E-05	NO	1.25E-02	NO	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	5.94E-05	NO	1.48E-02	NO	Sub581	4.53E-05	NO	1.94E-02	NO
Sub575	1.72E-04	NO	1.48E-02	NO	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: TECHNETIUM-99 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.26E-05	5.56E-05	2.18E-04	6.03E-04
Single storm adsorbed contaminant quantity PXi (g):	3.99E-04	2.34E-04	9.67E-04	1.34E-03
Annual adsorbed contaminant quantity (g):	1.73E-02	1.78E-03	8.68E-03	2.24E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.25E-05	1.66E-05	5.94E-05	1.72E-04
Single storm dissolved contaminant quantity PQi (g):	6.00E-02	5.64E-02	3.35E-01	6.00E-01
Annual dis. conta. qt (based on sediment yield)(g):	2.60E+00	4.28E-01	3.00E+00	1.00E+01
Annual dis. conta. qt (based on runoff) (g):	9.80E-01	9.41E-01	5.61E+00	1.00E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.57E-04	1.46E-04	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.41E-03	1.27E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.45E-02	2.10E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.65E-04	4.53E-05	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.31E+00	5.76E-01	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.09E+01	9.58E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.48E+01	9.58E+00	0.00E+00

PADDYS RUN BASIN	CHEMICAL: THORIUM-230	SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/22/94 12:33

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.84E-09	2.33E-05	1.70E+05	2.00E-01	9.68E-10
Sub570	1.31E-08	7.36E-05	1.99E+05	9.68E-01	1.26E-08
Sub575	3.18E-09	1.11E-05	1.23E+05	2.62E-01	8.32E-10
Sub580	3.17E-10	3.90E-07	4.34E+04	1.28E-01	4.06E-11
Sub581	5.05E-09	6.42E-05	4.49E+05	9.06E-01	4.57E-09
Sub582	9.35E-10	9.74E-06	3.68E+05	4.35E-01	4.07E-10

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.84E-09	2.33E-05	8.14E-04
Sub570	1.31E-08	7.36E-05	2.35E-03
sub575	3.18E-09	1.11E-05	5.46E-04
Sub 580, 581 & 582	3.05E-09	7.43E-05	4.83E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.27E-05	2.28E-03
D-D	1.27E-05	2.28E-03
E-E	1.27E-05	2.28E-03
Max:	1.27E-05	2.28E-03

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	6.24E-07
Avg. Conc. in GMR	6.26E-08
Max. Conc. in Paddys Run at GMR	1.05E-05
Max. Conc. in GMR at Paddys Run	1.05E-06
Max. Conc. in GMR at Eff. Line (max week)	6.02E-06
Annual Conc. at Eff. Line	4.07E-07

Leading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.33E-05	2.56E-08	1.90E-06
D-E	7.5	11.1	13.9		1.15E-05	1.26E-08	1.11E-06
E-F	0.7	1.6	1.1	1.5	2.58E-06	2.82E-09	2.91E-07
SSOD				56.6	4.21E-05	4.61E-08	2.50E-06
TOTAL					7.94E-05		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.50E-03	1.83E-08	9.00E-09
D-E	7.69E-04	9.36E-09	4.62E-09
E-F	1.27E-04	1.55E-09	7.64E-10
SSOD	1.26E-03	1.53E-08	7.57E-09
TOTAL	3.66E-03	4.45E-08	2.20E-08

CPC SCREENING THORIUM-230 RISK CRITERIA : 1.80E-05 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.84E-09	YES	1.96E-06	YES	Sub580	3.17E-10	YES	3.17E-07	YES
Sub570	1.31E-08	YES	1.96E-06	YES	Sub581	5.05E-09	YES	2.50E-06	YES
Sub575	3.18E-09	YES	1.96E-06	YES	Sub582	9.35E-10	YES	9.35E-07	YES

CHEMICAL: THORIUM-230 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.14E-04	2.20E-04	2.35E-03	5.46E-04
Single storm adsorbed contaminant quantity PXi (g):	7.61E-03	9.27E-04	1.04E-02	1.21E-03
Annual adsorbed contaminant quantity (g):	3.30E-01	7.03E-03	9.38E-02	2.03E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.84E-09	1.34E-09	1.31E-08	3.18E-09
Single storm dissolved contaminant quantity PQi (g):	2.33E-05	4.55E-06	7.36E-05	1.11E-05
Annual dis. conta. qt (based on sediment yield)(g):	1.01E-03	3.45E-05	6.61E-04	1.85E-04
Annual dis. conta. qt (based on runoff) (g):	3.81E-04	7.58E-05	1.23E-03	1.85E-04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.83E-05	1.47E-02	7.97E-04	1.50E-04
Single storm adsorbed contaminant quantity PXi (g):	2.97E-04	1.16E-01	6.92E-02	1.43E-03
Annual adsorbed contaminant quantity (g):	4.62E-03	3.84E-01	1.15E+00	3.70E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.17E-10	8.88E-08	5.05E-09	9.35E-10
Single storm dissolved contaminant quantity PQi (g):	3.90E-07	1.77E-03	6.42E-05	9.74E-06
Annual dis. conta. qt (based on sediment yield)(g):	6.06E-06	5.85E-03	1.07E-03	2.52E-04
Annual dis. conta. qt (based on runoff) (g):	6.40E-06	2.94E-02	1.07E-03	1.67E-04

PADDYS RUN BASIN | CHEMICAL: THORIUM-232 + 10D | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/16/94 15:29

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.15E-05	3.44E-01	1.70E+05	2.00E-01	1.43E-05
Sub570	2.53E-04	1.43E+00	1.99E+05	9.68E-01	2.45E-04
Sub575	4.44E-05	1.55E-01	1.23E+05	2.62E-01	1.16E-05
Sub580	3.96E-05	4.86E-02	4.34E+04	1.28E-01	5.07E-06
Sub581	1.65E-04	2.10E+00	4.49E+05	9.06E-01	1.49E-04
Sub582	6.61E-05	6.89E-01	3.68E+05	4.35E-01	2.87E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	7.15E-05	3.44E-01	1.20E+01
Sub570	2.53E-04	1.43E+00	4.56E+01
sub575	4.44E-05	1.55E-01	7.64E+00
Sub 580, 581 & 582	1.16E-04	2.83E+00	1.85E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	2.46E-01	4.42E+01
D-D	2.46E-01	4.42E+01
E-E	2.46E-01	4.42E+01
Max:	2.46E-01	4.42E+01

Leading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.31E-01	4.72E-04	3.51E-02
D-E	7.5	11.1	13.9		2.06E-01	2.25E-04	2.00E-02
E-F	0.7	1.6	1.1	1.5	6.95E-02	7.61E-05	7.85E-03
SSOD				56.6	1.60E+00	1.76E-03	9.52E-02
TOTAL					2.31E+00		

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	1.63E-02
Avg. Conc. in GMR	1.64E-03
Max. Conc. in Paddys Run at GMR	2.03E-01
Max. Conc. in GMR at Paddys Run	2.04E-02
Max. Conc. in GMR at Eff. Line (max week)	8.11E-02
Annual Conc. at Eff. Line	5.69E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.65E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.67E+00

Total Mass Leading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.58E+01	3.14E-04	1.55E-04
D-E	1.28E+01	1.56E-04	7.71E-05
E-F	2.99E+00	3.64E-05	1.79E-05
SSOD	5.09E+01	6.20E-04	3.06E-04
TOTAL	9.25E+01	1.13E-03	5.56E-04

CPC SCREENING | THORIUM-232 + 10D RISK CRITERIA : 2.55E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.15E-05	YES	3.55E-02	YES	Sub580	3.96E-05	YES	3.96E-02	YES
Sub570	2.53E-04	YES	3.55E-02	YES	Sub581	1.65E-04	YES	9.52E-02	YES
Sub575	4.44E-05	YES	3.55E-02	YES	Sub582	6.61E-05	YES	6.61E-02	YES

CHEMICAL: THORIUM-232 + 10D Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.20E+01	1.52E+01	4.56E+01	7.64E+00
Single storm adsorbed contaminant quantity PXi (g):	1.12E+02	6.39E+01	2.03E+02	1.69E+01
Annual adsorbed contaminant quantity (g):	4.87E+03	4.85E+02	1.82E+03	2.83E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.15E-05	9.22E-05	2.53E-04	4.44E-05
Single storm dissolved contaminant quantity PQi (g):	3.44E-01	3.13E-01	1.43E+00	1.55E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.49E+01	2.38E+00	1.28E+01	2.59E+00
Annual dis. conta. qt (based on runoff) (g):	5.62E+00	5.22E+00	2.39E+01	2.59E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.27E+00	1.92E+02	2.60E+01	1.06E+01
Single storm adsorbed contaminant quantity PXi (g):	3.71E+01	1.52E+03	2.26E+03	1.01E+02
Annual adsorbed contaminant quantity (g):	5.77E+02	5.00E+03	3.76E+04	2.61E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.96E-05	1.16E-03	1.65E-04	6.61E-05
Single storm dissolved contaminant quantity PQi (g):	4.86E-02	2.31E+01	2.10E+00	6.89E-01
Annual dis. conta. qt (based on sediment yield)(g):	7.57E-01	7.62E+01	3.49E+01	1.78E+01
Annual dis. conta. qt (based on runoff) (g):	7.99E-01	3.84E+02	3.49E+01	1.18E+01

PADDYS RUN BASIN | CHEMICAL: URANIUM (Total) | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/25/94 9:42

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.46E-02	2.15E+02	1.70E+05	2.00E-01	8.92E-03
Sub570	8.01E-02	4.52E+02	1.99E+05	9.68E-01	7.76E-02
Sub575	3.47E-03	1.21E+01	1.23E+05	2.62E-01	9.09E-04
Sub580	2.66E-03	3.27E+00	4.34E+04	1.28E-01	3.40E-04
Sub581	2.25E-01	2.85E+03	4.49E+05	9.06E-01	2.03E-01
Sub582	2.58E-03	2.69E+01	3.68E+05	4.35E-01	1.12E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.46E-02	2.15E+02	8.51E+01
Sub570	8.01E-02	4.52E+02	5.52E+02
sub575	3.47E-03	1.21E+01	2.28E+01
Sub 580, 581 & 582	1.18E-01	2.88E+03	1.24E+02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	7.78E+01	5.35E+02
D-D	7.78E+01	5.35E+02
E-E	1.02E+02	5.35E+02
Max:	1.02E+02	5.35E+02

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.22E+01
Avg. Conc. in GMR	1.22E+00
Max. Conc. in Paddys Run at GMR	8.43E+01
Max. Conc. in GMR at Paddys Run	8.46E+00
Max. Conc. in GMR at Eff. Line (max week)	5.75E+00
Annual Conc. at Eff. Line	1.48E+00

Leading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.58E+02	1.73E-01	1.29E+01
D-E	7.5	11.1	13.9		6.79E+01	7.44E-02	6.59E+00
E-F	0.7	1.6	1.1	1.5	5.21E+01	5.71E-02	5.89E+00
SSOD				56.6	1.63E+03	1.79E+00	9.69E+01
TOTAL					1.91E+03		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.14E+04	1.39E-01	6.84E-02
D-E	4.69E+03	5.71E-02	2.82E-02
E-F	1.80E+03	2.19E-02	1.08E-02
SSOD	4.58E+04	5.58E-01	2.75E-01
TOTAL	6.37E+04	7.75E-01	3.82E-01

CPC SCREENING — URANIUM (Total) RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.46E-02	NO	1.25E+01	NO	Sub580	2.66E-03	YES	2.66E+00	YES
Sub570	8.01E-02	NO	1.25E+01	NO	Sub581	2.25E-01	NO	9.69E+01	NO
Sub575	3.47E-03	YES	3.47E+00	YES	Sub582	2.58E-03	YES	2.58E+00	YES

CHEMICAL: URANIUM (Total) BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.51E+01	1.52E+02	5.52E+02	2.28E+01
Single storm adsorbed contaminant quantity PXi (g):	7.97E+02	6.42E+02	2.45E+03	5.07E+01
Annual adsorbed contaminant quantity (g):	3.45E+04	4.87E+03	2.20E+04	8.47E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.46E-02	2.42E-02	8.01E-02	3.47E-03
Single storm dissolved contaminant quantity PQi (g):	2.15E+02	8.23E+01	4.52E+02	1.21E+01
Annual dis. conta. qt (based on sediment yield)(g):	9.29E+03	6.24E+02	4.06E+03	2.02E+02
Annual dis. conta. qt (based on runoff) (g):	3.51E+03	1.37E+03	7.57E+03	2.02E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.87E+01	3.38E+03	2.22E+02	1.58E+01
Single storm adsorbed contaminant quantity PXi (g):	9.52E+01	2.68E+04	1.93E+04	1.52E+02
Annual adsorbed contaminant quantity (g):	1.48E+03	8.82E+04	3.22E+05	3.91E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.66E-03	4.32E+00	2.25E-01	2.58E-03
Single storm dissolved contaminant quantity PQi (g):	3.27E+00	8.63E+04	2.85E+03	2.69E+01
Annual dis. conta. qt (based on sediment yield)(g):	5.08E+01	2.84E+05	4.75E+04	6.96E+02
Annual dis. conta. qt (based on runoff) (g):	5.36E+01	1.43E+06	4.75E+04	4.61E+02

PADDYS RUN BASIN | CHEMICAL: URANIUM-234 | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/25/94 9:36

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.39E-06	6.71E-03	1.70E+05	2.00E-01	2.79E-07
Sub570	1.07E-06	6.02E-03	1.99E+05	9.68E-01	1.03E-06
Sub575	3.84E-07	1.34E-03	1.23E+05	2.62E-01	1.01E-07
Sub580	2.97E-08	3.65E-05	4.34E+04	1.28E-01	3.80E-09
Sub581	7.61E-06	9.67E-02	4.49E+05	9.06E-01	6.89E-06
Sub582	1.29E-07	1.34E-03	3.68E+05	4.35E-01	5.61E-08

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.39E-06	6.71E-03	2.00E-03
Sub570	1.07E-06	6.02E-03	7.36E-03
sub575	3.84E-07	1.34E-03	2.53E-03
Sub 580, 581 & 582	4.03E-06	9.81E-02	3.89E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.04E-03	7.14E-03
D-D	1.04E-03	7.14E-03
E-E	2.79E-03	7.14E-03
Max:	2.79E-03	7.14E-03

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	3.84E-04
Avg. Conc. in GMR	3.85E-05
Max. Conc. in Paddys Run at GMR	2.30E-03
Max. Conc. in GMR at Paddys Run	2.31E-04
Max. Conc. in GMR at Eff. Line (max week)	3.82E-04
Annual Conc. at Eff. Line	1.91E-04

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass leading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.90E-03	3.18E-06	2.36E-04
D-E	7.5	11.1	13.9		1.36E-03	1.49E-06	1.32E-04
E-F	0.7	1.6	1.1	1.5	1.63E-03	1.79E-06	1.84E-04
SSOD				56.6	5.55E-02	6.08E-05	3.30E-03
TOTAL					6.14E-02		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.69E-01	3.27E-06	1.61E-06
D-E	1.22E-01	1.49E-06	7.35E-07
E-F	5.45E-02	6.64E-07	3.27E-07
SSOD	1.56E+00	1.90E-05	9.37E-06
TOTAL	2.01E+00	2.44E-05	1.21E-05

CPC SCREENING | URANIUM-234 RISK CRITERIA : 4.82E-05 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.39E-06	NO	2.43E-04	NO	Sub580	2.97E-08	YES	2.97E-05	YES
Sub570	1.07E-06	NO	2.43E-04	NO	Sub581	7.61E-06	NO	3.30E-03	NO
Sub575	3.84E-07	NO	2.43E-04	NO	Sub582	1.29E-07	NO	1.29E-04	NO

CHEMICAL: URANIUM-234 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.00E-03	1.24E-03	7.36E-03	2.53E-03
Single storm adsorbed contaminant quantity PXi (g):	1.88E-02	5.22E-03	3.27E-02	5.61E-03
Annual adsorbed contaminant quantity (g):	8.12E-01	3.96E-02	2.94E-01	9.38E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.39E-06	1.97E-07	1.07E-06	3.84E-07
Single storm dissolved contaminant quantity PQi (g):	6.71E-03	6.68E-04	6.02E-03	1.34E-03
Annual dis. conta. qt (based on sediment yield)(g):	2.90E-01	5.07E-03	5.41E-02	2.24E-02
Annual dis. conta. qt (based on runoff) (g):	1.10E-01	1.11E-02	1.01E-01	2.24E-02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.09E-04	2.03E-01	6.78E-03	7.90E-04
Single storm adsorbed contaminant quantity PXi (g):	1.06E-03	1.61E+00	5.90E-01	7.56E-03
Annual adsorbed contaminant quantity (g):	1.66E-02	5.30E+00	9.81E+00	1.95E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.97E-08	2.98E-04	7.61E-06	1.29E-07
Single storm dissolved contaminant quantity PQi (g):	3.65E-05	5.95E+00	9.67E-02	1.34E-03
Annual dis. conta. qt (based on sediment yield)(g):	5.68E-04	1.96E+01	1.61E+00	3.47E-02
Annual dis. conta. qt (based on runoff) (g):	5.99E-04	9.86E+01	1.61E+00	2.30E-02

PADDYS RUN BASIN | **CHEMICAL:** URANIUM-235/236 | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/25/94 9:38

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.98E-04	1.44E+00	1.70E+05	2.00E-01	5.96E-05
Sub570	3.27E-04	1.84E+00	1.99E+05	9.68E-01	3.17E-04
Sub575	1.23E-04	4.29E-01	1.23E+05	2.62E-01	3.23E-05
Sub580	5.97E-06	7.33E-03	4.34E+04	1.28E-01	7.64E-07
Sub581	2.05E-03	2.61E+01	4.49E+05	9.06E-01	1.86E-03
Sub582	1.40E-05	1.46E-01	3.68E+05	4.35E-01	6.11E-06

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.63E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.98E-04	1.44E+00	5.61E-01
Sub570	3.27E-04	1.84E+00	2.26E+00
sub575	1.23E-04	4.29E-01	8.12E-01
Sub 580, 581 & 582	1.08E-03	2.62E+01	1.26E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.19E-01	2.19E+00
D-D	3.19E-01	2.19E+00
E-E	7.62E-01	2.19E+00
Max:	7.62E-01	2.19E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	1.03E-01
Avg. Conc. in GMR	1.03E-02
Max. Conc. in Paddys Run at GMR	8.38E-01
Max. Conc. in GMR at Paddys Run	8.32E-02
Max. Conc. in GMR at Eff. Line (max week)	8.82E-02
Annual Conc. at Eff. Line	1.76E-02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.60E-01	8.33E-04	6.20E-02
D-E	7.5	11.1	13.9		3.72E-01	4.08E-04	3.61E-02
E-F	0.7	1.6	1.1	1.5	4.38E-01	4.80E-04	4.95E-02
SSOD				56.6	1.48E+01	1.63E-02	8.81E-01
TOTAL					1.64E+01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.35E+01	7.73E-04	3.81E-04
D-E	3.09E+01	3.77E-04	1.86E-04
E-F	1.44E+01	1.76E-04	8.66E-05
SSOD	4.16E+02	5.06E-03	2.50E-03
TOTAL	5.24E+02	6.39E-03	3.15E-03

CPC SCREENING | **URANIUM-235/236 RISK CRITERIA :** 1.39E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.98E-04	NO	6.46E-02	YES	Sub580	5.97E-06	YES	5.97E-03	YES
Sub570	3.27E-04	NO	6.46E-02	YES	Sub581	2.05E-03	NO	8.81E-01	NO
Sub575	1.23E-04	YES	6.46E-02	YES	Sub582	1.40E-05	YES	1.40E-02	YES

CHEMICAL: URANIUM-235/236 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.61E-01	1.20E+00	2.26E+00	8.12E-01
Single storm adsorbed contaminant quantity PXi (g):	5.25E+00	5.05E+00	1.00E+01	1.80E+00
Annual adsorbed contaminant quantity (g):	2.27E+02	3.83E+01	9.00E+01	3.01E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.98E-04	1.90E-04	3.27E-04	1.23E-04
Single storm dissolved contaminant quantity PQi (g):	1.44E+00	6.47E-01	1.84E+00	4.29E-01
Annual dis. conta. qt (based on sediment yield)(g):	6.21E+01	4.91E+00	1.66E+01	7.18E+00
Annual dis. conta. qt (based on runoff) (g):	2.34E+01	1.08E+01	3.09E+01	7.18E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.20E-02	3.80E+01	2.34E+00	8.61E-02
Single storm adsorbed contaminant quantity PXi (g):	2.14E-01	3.01E+02	2.03E+02	8.23E-01
Annual adsorbed contaminant quantity (g):	3.33E+00	9.92E+02	3.38E+03	2.13E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.97E-06	5.22E-02	2.05E-03	1.40E-05
Single storm dissolved contaminant quantity PQi (g):	7.33E-03	1.04E+03	2.61E+01	1.46E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.14E-01	3.44E+03	4.34E+02	3.78E+00
Annual dis. conta. qt (based on runoff) (g):	1.20E-01	1.73E+04	4.34E+02	2.51E+00

PADDYS RUN BASIN | **CHEMICAL:** *URANIUM-238 + 2D* | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/25/94 9 40

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.05E-02	2.91E+02	1.70E+05	2.00E-01	1.21E-02
Sub570	9.25E-02	5.21E+02	1.99E+05	9.68E-01	8.95E-02
Sub575	3.31E-03	1.15E+01	1.23E+05	2.62E-01	8.68E-04
Sub580	7.61E-04	9.35E-01	4.34E+04	1.28E-01	9.74E-05
Sub581	1.47E-01	1.87E+03	4.49E+05	9.06E-01	1.33E-01
Sub582	3.27E-03	3.41E+01	3.68E+05	4.35E-01	1.42E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.83E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.05E-02	2.91E+02	1.91E+02
Sub570	9.25E-02	5.21E+02	6.37E+02
sub575	3.31E-03	1.15E+01	2.18E+01
Sub 580, 581 & 582	7.81E-02	1.90E+03	1.28E+02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.99E+01	6.18E+02
D-D	8.99E+01	6.18E+02
E-E	8.99E+01	6.18E+02
Max:	8.99E+01	6.18E+02

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	9.34E+00
Avg. Conc. in GMR	9.37E-01
Max. Conc. in Paddys Run at GMR	7.42E+01
Max. Conc. in GMR at Paddys Run	7.45E+00
Max. Conc. in GMR at Eff. Line (max week)	8.31E+00
Annual Conc. at Eff. Line	2.19E+00

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.91E+02	2.10E-01	1.56E+01
D-E	7.5	11.1	13.9		8.13E+01	8.91E-02	7.89E+00
E-F	0.7	1.6	1.1	1.5	3.90E+01	4.28E-02	4.41E+00
SSOD				56.6	1.08E+03	1.18E+00	6.39E+01
TOTAL					1.39E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.45E+04	1.76E-01	8.69E-02
D-E	5.86E+03	7.14E-02	3.52E-02
E-F	1.52E+03	1.85E-02	9.14E-03
SSOD	3.04E+04	3.70E-01	1.82E-01
TOTAL	5.22E+04	6.36E-01	3.13E-01

CPC SCREENING — **URANIUM-238 + 2D RISK CRITERIA :** 5.66E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.05E-02	NO	1.51E+01	NO	Sub580	7.61E-04	NO	7.61E-01	NO
Sub570	9.25E-02	NO	1.51E+01	NO	Sub581	1.47E-01	NO	6.39E+01	NO
Sub575	3.31E-03	NO	3.31E+00	NO	Sub582	3.27E-03	NO	3.27E+00	NO

CHEMICAL: URANIUM-238 + 2D BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.91E+02	4.12E+02	6.37E+02	2.18E+01
Single storm adsorbed contaminant quantity PXi (g):	1.79E+03	1.73E+03	2.83E+03	4.84E+01
Annual adsorbed contaminant quantity (g):	7.73E+04	1.32E+04	2.54E+04	8.09E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.05E-02	6.54E-02	9.25E-02	3.31E-03
Single storm dissolved contaminant quantity PQi (g):	2.91E+02	2.22E+02	5.21E+02	1.15E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.26E+04	1.69E+03	4.68E+03	1.93E+02
Annual dis. conta. qt (based on runoff) (g):	4.76E+03	3.70E+03	8.74E+03	1.93E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.35E+00	4.28E+03	2.29E+02	2.01E+01
Single storm adsorbed contaminant quantity PXi (g):	2.73E+01	3.39E+04	1.99E+04	1.92E+02
Annual adsorbed contaminant quantity (g):	4.25E+02	1.12E+05	3.31E+05	4.96E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.61E-04	6.44E+00	1.47E-01	3.27E-03
Single storm dissolved contaminant quantity PQi (g):	9.35E-01	1.29E+05	1.87E+03	3.41E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.46E+01	4.24E+05	3.11E+04	8.81E+02
Annual dis. conta. qt (based on runoff) (g):	1.54E+01	2.13E+06	3.11E+04	5.84E+02

PADDYS RUN BASIN | CHEMICAL: ALUMINUM | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 7:58

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.36E-01	1.14E+03	1.70E+05	2.00E-01	4.72E-02
Sub570	2.47E-01	1.39E+03	1.99E+05	9.68E-01	2.39E-01
Sub575	2.36E-01	8.22E+02	1.23E+05	2.62E-01	6.18E-02
Sub580	1.82E-01	2.24E+02	4.34E+04	1.28E-01	2.33E-02
Sub581	2.52E-01	3.20E+03	4.49E+05	9.06E-01	2.28E-01
Sub582	2.38E-01	2.48E+03	3.68E+05	4.35E-01	1.04E-01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.36E-01	1.14E+03	1.03E+04
Sub570	2.47E-01	1.39E+03	1.15E+04
sub575	2.36E-01	8.22E+02	1.05E+04
Sub 580, 581 & 582	2.42E-01	5.90E+03	1.00E+04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.41E+02	1.12E+04
D-D	2.41E+02	1.12E+04
E-E	2.43E+02	1.12E+04
Max:	2.43E+02	1.12E+04

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	3.17E+01
Avg. Conc. in GMR	3.18E+00
Max. Conc. in Paddys Run at GMR	2.01E+02
Max. Conc. in GMR at Paddys Run	2.02E+01
Max. Conc. in GMR at Eff. Line (max week)	7.04E+00
Annual Conc. at Eff. Line	6.83E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per call (ug/l)
C-D	20.6	25.2			5.85E+02	6.41E-01	4.77E+01
D-E	7.5	11.1	13.9		3.54E+02	3.88E-01	3.44E+01
E-F	0.7	1.6	1.1	1.5	1.28E+02	1.40E-01	1.44E+01
SSOD				56.6	3.34E+03	3.66E+00	1.98E+02
TOTAL					4.41E+03		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.96E+04	6.03E-01	2.98E-01
D-E	3.13E+04	3.81E-01	1.88E-01
E-F	6.27E+03	7.63E-02	3.76E-02
SSOD	1.15E+05	1.41E+00	6.93E-01
TOTAL	2.03E+05	2.47E+00	1.22E+00

CPC SCREENING | ALUMINUM RISK CRITERIA : 1.10E+04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.36E-01	YES	5.56E+01	YES	Sub580	1.82E-01	YES	1.82E+02	YES
Sub570	2.47E-01	YES	5.56E+01	YES	Sub581	2.52E-01	YES	1.98E+02	YES
Sub575	2.36E-01	YES	5.56E+01	YES	Sub582	2.38E-01	YES	1.98E+02	YES

CHEMICAL: ALUMINUM BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.03E+04	8.92E+03	1.15E+04	1.05E+04
Single storm adsorbed contaminant quantity PXi (g):	9.60E+04	3.76E+04	5.12E+04	2.33E+04
Annual adsorbed contaminant quantity (g):	4.16E+06	2.85E+05	4.59E+05	3.89E+05
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.36E-01	2.10E-01	2.47E-01	2.36E-01
Single storm dissolved contaminant quantity PQi (g):	1.14E+03	7.13E+02	1.39E+03	8.22E+02
Annual dis. conta. qt (based on sediment yield)(g):	4.92E+04	5.41E+03	1.25E+04	1.37E+04
Annual dis. conta. qt (based on runoff) (g):	1.86E+04	1.19E+04	2.34E+04	1.37E+04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.67E+03	1.20E+04	1.03E+04	9.86E+03
Single storm adsorbed contaminant quantity PXi (g):	4.42E+04	9.55E+04	8.93E+05	9.43E+04
Annual adsorbed contaminant quantity (g):	6.88E+05	3.15E+05	1.49E+07	2.44E+06
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.82E-01	2.82E-01	2.52E-01	2.38E-01
Single storm dissolved contaminant quantity PQi (g):	2.24E+02	5.63E+03	3.20E+03	2.48E+03
Annual dis. conta. qt (based on sediment yield)(g):	3.49E+03	1.85E+04	5.32E+04	6.41E+04
Annual dis. conta. qt (based on runoff) (g):	3.68E+03	9.33E+04	5.32E+04	4.25E+04

PADDYS RUN BASIN | **CHEMICAL:** ANTIMONY | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 8:00

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	9.97E-04	4.80E+00	1.70E+05	2.00E-01	1.99E-04
Sub570	1.25E-03	7.02E+00	1.99E+05	9.68E-01	1.21E-03
Sub575	1.02E-04	3.57E-01	1.23E+05	2.62E-01	2.68E-05
Sub580	9.59E-05	1.18E-01	4.34E+04	1.28E-01	1.23E-05
Sub581	1.12E-03	1.43E+01	4.49E+05	9.06E-01	1.02E-03
Sub582	1.10E-04	1.15E+00	3.68E+05	4.35E-01	4.79E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	9.97E-04	4.80E+00	7.22E+00
Sub570	1.25E-03	7.02E+00	9.67E+00
sub575	1.02E-04	3.57E-01	7.60E-01
Sub 580, 581 & 582	6.38E-04	1.56E+01	4.35E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — **Leading to the Great Miami Aquifer**

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.21E+00	9.40E+00
D-D	1.21E+00	9.40E+00
E-E	1.21E+00	9.40E+00
Max:	1.21E+00	9.40E+00

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.76E+00	3.02E-03	2.25E-01
D-E	7.5	11.1	13.9		1.19E+00	1.30E-03	1.15E-01
E-F	0.7	1.6	1.1	1.5	3.83E-01	4.20E-04	4.33E-02
SSOD				56.6	8.60E+00	9.65E-03	5.23E-01
TOTAL					1.31E+01		

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	9.49E-02
Avg. Conc. in GMR	9.53E-03
Max. Conc. in Paddys Run at GMR	1.00E+00
Max. Conc. in GMR at Paddys Run	1.00E-01
Max. Conc. in GMR at Eff. Line (max week)	5.83E-03
Annual Conc. at Eff. Line	3.64E-04

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.21E+02	2.70E-03	1.33E-03
D-E	9.16E+01	1.12E-03	5.50E-04
E-F	1.76E+01	2.14E-04	1.06E-04
SSOD	2.56E+02	3.12E-03	1.54E-03
TOTAL	5.87E+02	7.14E-03	3.52E-03

CPC SCREENING — **ANTIMONY RISK CRITERIA :** 1.50E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	9.97E-04	YES	2.20E-01	YES	Sub580	9.59E-05	YES	9.59E-02	YES
Sub570	1.25E-03	YES	2.20E-01	YES	Sub581	1.12E-03	YES	5.23E-01	YES
Sub575	1.02E-04	YES	1.02E-01	YES	Sub582	1.10E-04	YES	1.10E-01	YES

CHEMICAL: ANTIMONY BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.22E+00	1.35E+01	9.67E+00	7.60E-01
Single storm adsorbed contaminant quantity PXi (g):	6.75E+01	5.70E+01	4.30E+01	1.69E+00
Annual adsorbed contaminant quantity (g):	2.92E+03	4.33E+02	3.86E+02	2.82E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.97E-04	1.91E-03	1.25E-03	1.02E-04
Single storm dissolved contaminant quantity PQi (g):	4.80E+00	6.49E+00	7.02E+00	3.57E-01
Annual dis. conta. qt (based on sediment yield)(g):	2.08E+02	4.92E+01	6.30E+01	5.97E+00
Annual dis. conta. qt (based on runoff) (g):	7.83E+01	1.08E+02	1.18E+02	5.97E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.60E-01	4.84E+00	7.65E+00	7.60E-01
Single storm adsorbed contaminant quantity PXi (g):	3.87E+00	3.83E+01	6.65E+02	7.26E+00
Annual adsorbed contaminant quantity (g):	6.03E+01	1.26E+02	1.11E+04	1.88E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.59E-05	6.78E-04	1.12E-03	1.10E-04
Single storm dissolved contaminant quantity PQi (g):	1.18E-01	1.36E+01	1.43E+01	1.15E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.83E+00	4.47E+01	2.38E+02	2.96E+01
Annual dis. conta. qt (based on runoff) (g):	1.94E+00	2.25E+02	2.38E+02	1.96E+01

000559

PADDYS RUN BASIN | **CHEMICAL:** *ARSENIC* | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 8:03

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.96E-03	9.41E+00	1.70E+05	2.00E-01	3.91E-04
Sub570	3.91E-03	2.21E+01	1.99E+05	9.68E-01	3.79E-03
Sub575	1.14E-03	3.97E+00	1.23E+05	2.62E-01	2.99E-04
Sub580	1.02E-03	1.26E+00	4.34E+04	1.28E-01	1.31E-04
Sub581	1.58E-03	2.01E+01	4.49E+05	9.06E-01	1.43E-03
Sub582	1.59E-03	1.65E+01	3.68E+05	4.35E-01	6.90E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.96E-03	9.41E+00	1.13E+01
Sub570	3.91E-03	2.21E+01	2.43E+01
sub575	1.14E-03	3.97E+00	6.77E+00
Sub 580, 581 & 582	1.55E-03	3.78E+01	8.55E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.80E+00	2.36E+01
D-D	3.80E+00	2.36E+01
E-E	3.80E+00	2.36E+01
Max:	3.80E+00	2.36E+01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	2.51E-01
Avg. Conc. in GMR	2.52E-02
Max. Conc. in Paddys Run at GMR	3.14E+00
Max. Conc. in GMR at Paddys Run	3.15E-01
Max. Conc. in GMR at Eff. Line (max week)	7.28E-03
Annual Conc. at Eff. Line	1.07E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.50E+00	8.22E-03	6.11E-01
D-E	7.5	11.1	13.9		3.71E+00	4.06E-03	3.60E-01
E-F	0.7	1.6	1.1	1.5	1.03E+00	1.13E-03	1.16E-01
SSOD				56.6	2.14E+01	2.35E-02	1.27E+00
TOTAL					3.37E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.23E+02	6.37E-03	3.14E-03
D-E	2.67E+02	3.25E-03	1.60E-03
E-F	5.12E+01	6.23E-04	3.07E-04
SSOD	7.45E+02	9.08E-03	4.48E-03
TOTAL	1.59E+03	1.93E-02	9.53E-03

CPC SCREENING | **ARSENIC RISK CRITERIA :** 4.90E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.96E-03	NO	6.33E-01	NO	Sub580	1.02E-03	NO	1.02E+00	NO
Sub570	3.91E-03	NO	6.33E-01	NO	Sub581	1.58E-03	NO	1.27E+00	NO
Sub575	1.14E-03	NO	6.33E-01	NO	Sub582	1.59E-03	NO	1.27E+00	NO

CHEMICAL: ARSENIC BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.13E+01	6.09E+00	2.43E+01	6.77E+00
Single storm adsorbed contaminant quantity PXi (g):	1.06E+02	2.57E+01	1.08E+02	1.50E+01
Annual adsorbed contaminant quantity (g):	4.59E+03	1.95E+02	9.70E+02	2.51E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.96E-03	1.07E-03	3.91E-03	1.14E-03
Single storm dissolved contaminant quantity PQi (g):	9.41E+00	3.65E+00	2.21E+01	3.97E+00
Annual dis. conta. qt (based on sediment yield)(g):	4.07E+02	2.77E+01	1.98E+02	6.64E+01
Annual dis. conta. qt (based on runoff) (g):	1.54E+02	6.08E+01	3.70E+02	6.64E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.50E+00	1.01E+01	8.59E+00	8.76E+00
Single storm adsorbed contaminant quantity PXi (g):	3.31E+01	7.97E+01	7.46E+02	8.37E+01
Annual adsorbed contaminant quantity (g):	5.15E+02	2.63E+02	1.24E+04	2.16E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.02E-03	1.76E-03	1.58E-03	1.59E-03
Single storm dissolved contaminant quantity PQi (g):	1.26E+00	3.52E+01	2.01E+01	1.65E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.96E+01	1.16E+02	3.34E+02	4.27E+02
Annual dis. conta. qt (based on runoff) (g):	2.07E+01	5.84E+02	3.34E+02	2.83E+02

PADDYS RUN BASIN | CHEMICAL: BARIUM | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 5/23/94 6:05

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.90E-03	1.40E+01	1.70E+05	2.00E-01	5.80E-04
Sub570	2.87E-03	1.62E+01	1.99E+05	9.68E-01	2.77E-03
Sub575	3.00E-03	1.04E+01	1.23E+05	2.62E-01	7.86E-04
Sub580	2.12E-03	2.61E+00	4.34E+04	1.28E-01	2.71E-04
Sub581	3.50E-03	4.45E+01	4.49E+05	9.06E-01	3.17E-03
Sub582	2.39E-03	2.49E+01	3.68E+05	4.35E-01	1.04E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.90E-03	1.40E+01	9.58E+01
Sub570	2.87E-03	1.62E+01	1.01E+02
sub575	3.00E-03	1.04E+01	1.01E+02
Sub 580, 581 & 582	2.96E-03	7.20E+01	9.27E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.79E+00	9.88E+01
D-D	2.79E+00	9.88E+01
E-E	2.91E+00	9.88E+01
Max:	2.91E+00	9.88E+01

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	3.85E-01
Avg. Conc. in GMR	3.87E-02
Max. Conc. in Paddys Run at GMR	2.40E+00
Max. Conc. in GMR at Paddys Run	2.41E-01
Max. Conc. in GMR at Eff. Line (max week)	1.01E-01
Annual Conc. at Eff. Line	9.24E-03

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cs8 (ug/l)
C-D	20.6	25.2			6.95E+00	7.61E-03	5.66E-01
D-E	7.5	11.1	13.9		4.29E+00	4.70E-03	4.16E-01
E-F	0.7	1.6	1.1	1.5	1.55E+00	1.70E-03	1.75E-01
SSOD				56.6	4.08E+01	4.47E-02	2.42E+00
TOTAL					5.35E+01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.98E+02	7.29E-03	3.59E-03
D-E	3.85E+02	4.68E-03	2.31E-03
E-F	7.51E+01	9.15E-04	4.51E-04
SSOD	1.36E+03	1.66E-02	8.16E-03
TOTAL	2.42E+03	2.94E-02	1.45E-02

CPC SCREENING — BARIUM RISK CRITERIA : 2.60E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.90E-03	YES	6.68E-01	YES	Sub580	2.12E-03	YES	2.12E+00	YES
Sub570	2.87E-03	YES	6.68E-01	YES	Sub581	3.50E-03	YES	2.42E+00	YES
Sub575	3.00E-03	YES	6.68E-01	YES	Sub582	2.39E-03	YES	2.39E+00	YES

CHEMICAL: BARIUM BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	9.58E+01	6.61E+01	1.01E+02	1.01E+02
Single storm adsorbed contaminant quantity PXi (g):	8.96E+02	2.78E+02	4.51E+02	2.25E+02
Annual adsorbed contaminant quantity (g):	3.88E+04	2.11E+03	4.05E+03	3.76E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.90E-03	2.04E-03	2.87E-03	3.00E-03
Single storm dissolved contaminant quantity PQi (g):	1.40E+01	6.95E+00	1.62E+01	1.04E+01
Annual dis. conta. qt (based on sediment yield)(g):	6.04E+02	5.27E+01	1.45E+02	1.75E+02
Annual dis. conta. qt (based on runoff) (g):	2.28E+02	1.16E+02	2.71E+02	1.75E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.66E+01	2.01E+02	1.09E+02	7.51E+01
Single storm adsorbed contaminant quantity PXi (g):	3.90E+02	1.60E+03	9.45E+03	7.18E+02
Annual adsorbed contaminant quantity (g):	6.08E+03	5.26E+03	1.57E+05	1.86E+04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.12E-03	6.19E-03	3.50E-03	2.39E-03
Single storm dissolved contaminant quantity PQi (g):	2.61E+00	1.24E+02	4.45E+01	2.49E+01
Annual dis. conta. qt (based on sediment yield)(g):	4.06E+01	4.08E+02	7.41E+02	6.42E+02
Annual dis. conta. qt (based on runoff) (g):	4.28E+01	2.05E+03	7.41E+02	4.26E+02

PADDYS RUN BASIN CHEMICAL: BERYLLIUM SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 8:07

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.89E-05	1.87E-01	1.70E+05	2.00E-01	7.77E-06
Sub570	3.91E-05	2.20E-01	1.99E+05	9.68E-01	3.78E-05
Sub575	3.74E-05	1.30E-01	1.23E+05	2.62E-01	9.81E-06
Sub580	1.46E-05	1.79E-02	4.34E+04	1.28E-01	1.86E-06
Sub581	3.61E-05	4.59E-01	4.49E+05	9.06E-01	3.27E-05
Sub582	3.91E-05	4.07E-01	3.68E+05	4.35E-01	1.70E-05

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.89E-05	1.87E-01	1.46E+00
Sub570	3.91E-05	2.20E-01	1.58E+00
sub575	3.74E-05	1.30E-01	1.44E+00
Sub 580, 581 & 582	3.63E-05	8.84E-01	1.30E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.80E-02	1.53E+00
D-D	3.80E-02	1.53E+00
E-E	3.80E-02	1.53E+00
Max:	3.80E-02	1.53E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	4.87E-03
Avg. Conc. in GMR	4.88E-04
Max. Conc. in Paddys Run at GMR	3.14E-02
Max. Conc. in GMR at Paddys Run	3.15E-03
Max. Conc. in GMR at Eff. Line (max week)	7.69E-04
Annual Conc. at Eff. Line	7.10E-05

Leading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.40E-02	1.03E-04	7.66E-03
D-E	7.5	11.1	13.9		5.66E-02	6.20E-05	5.49E-03
E-F	0.7	1.6	1.1	1.5	1.95E-02	2.14E-05	2.21E-03
SSOD				56.6	5.00E-01	5.48E-04	2.97E-02
TOTAL					6.70E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	8.06E+00	9.81E-05	4.84E-05
D-E	5.03E+00	6.13E-05	3.02E-05
E-F	9.82E-01	1.20E-05	5.90E-06
SSOD	1.76E+01	2.14E-04	1.06E-04
TOTAL	3.17E+01	3.86E-04	1.90E-04

CPC SCREENING BERYLLIUM RISK CRITERIA : 2.00E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.89E-05	NO	8.91E-03	NO	Sub580	1.46E-05	NO	1.45E-02	NO
Sub570	3.91E-05	NO	8.91E-03	NO	Sub581	3.61E-05	NO	2.97E-02	NO
Sub575	3.74E-05	NO	8.91E-03	NO	Sub582	3.91E-05	NO	2.97E-02	NO

CHEMICAL: BERYLLIUM BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.46E+00	6.54E-01	1.58E+00	1.44E+00
Single storm adsorbed contaminant quantity PXi (g):	1.37E+01	2.75E+00	7.00E+00	3.20E+00
Annual adsorbed contaminant quantity (g):	5.93E+02	2.09E+01	6.29E+01	5.35E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.89E-05	1.77E-05	3.91E-05	3.74E-05
Single storm dissolved contaminant quantity PQi (g):	1.87E-01	6.03E-02	2.20E-01	1.30E-01
Annual dis. conta. qt (based on sediment yield)(g):	8.10E+00	4.57E-01	1.98E+00	2.18E+00
Annual dis. conta. qt (based on runoff) (g):	3.06E+00	1.00E+00	3.69E+00	2.18E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.00E-01	1.47E+00	1.28E+00	1.40E+00
Single storm adsorbed contaminant quantity PXi (g):	3.06E+00	1.16E+01	1.11E+02	1.34E+01
Annual adsorbed contaminant quantity (g):	4.76E+01	3.83E+01	1.85E+03	3.46E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.46E-05	3.95E-05	3.61E-05	3.91E-05
Single storm dissolved contaminant quantity PQi (g):	1.79E-02	7.91E-01	4.59E-01	4.07E-01
Annual dis. conta. qt (based on sediment yield)(g):	2.79E-01	2.60E+00	7.63E+00	1.05E+01
Annual dis. conta. qt (based on runoff) (g):	2.94E-01	1.31E+01	7.63E+00	6.97E+00

PADDYS RUN BASIN | **CHEMICAL:** BORON | **SCENARIO: WITH STORMWATER CONTROLS** Baseline

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 6/16/94 20:34

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.55E-01	7.47E+02	1.70E+05	2.00E-01	3.11E-02
Sub570	1.40E-01	7.89E+02	1.99E+05	9.68E-01	1.36E-01
Sub575	1.46E-01	5.10E+02	1.23E+05	2.62E-01	3.84E-02
Sub580	1.37E-01	1.69E+02	4.34E+04	1.28E-01	1.76E-02
Sub581	1.64E-01	2.09E+03	4.49E+05	9.06E-01	1.49E-01
Sub582	1.64E-01	1.71E+03	3.68E+05	4.35E-01	7.13E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	1.55E-01	7.47E+02	1.35E+01
Sub570	1.40E-01	7.89E+02	1.30E+01
sub575	1.46E-01	5.10E+02	1.30E+01
Sub 580, 581 & 582	1.63E-01	3.97E+03	1.35E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	1.37E+02	1.27E+01
D-D	1.37E+02	1.27E+01
E-E	1.53E+02	1.33E+01
Max:	1.53E+02	1.33E+01

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	2.06E+01
Avg. Conc. in GMR	2.07E+00
Max. Conc. in Paddys Run at GMR	1.26E+02
Max. Conc. in GMR at Paddys Run	1.27E+01
Max. Conc. in GMR at Eff. Line (max week)	1.68E-01
Annual Conc. at Eff. Line	5.80E-02
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.09E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.10E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.53E+02	3.87E-01	2.88E+01
D-E	7.5	11.1	13.9		2.15E+02	2.35E-01	2.08E+01
E-F	0.7	1.6	1.1	1.5	8.30E+01	9.10E-02	9.36E+00
SSOD				56.6	2.25E+03	2.46E+00	1.33E+02
TOTAL					2.90E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.12E+04	3.80E-01	1.88E-01
D-E	1.95E+04	2.38E-01	1.17E-01
E-F	4.04E+03	4.92E-02	2.43E-02
SSOD	7.80E+04	9.49E-01	4.68E-01
TOTAL	1.33E+05	1.62E+00	7.97E-01

CPC SCREENING — **BORON RISK CRITERIA :** 3.30E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.55E-01	YES	3.37E+01	YES	Sub580	1.37E-01	YES	1.33E+02	YES
Sub570	1.40E-01	YES	3.37E+01	YES	Sub581	1.64E-01	YES	1.33E+02	YES
Sub575	1.46E-01	YES	3.37E+01	YES	Sub582	1.64E-01	YES	1.33E+02	YES

CHEMICAL: BORON Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.35E+01	1.31E+01	1.30E+01	1.30E+01
Single storm adsorbed contaminant quantity PXi (g):	1.26E+02	5.50E+01	5.80E+01	2.89E+01
Annual adsorbed contaminant quantity (g):	5.47E+03	4.17E+02	5.21E+02	4.83E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.55E-01	1.53E-01	1.40E-01	1.46E-01
Single storm dissolved contaminant quantity PQi (g):	7.47E+02	5.21E+02	7.89E+02	5.10E+02
Annual dis. conta. qt (based on sediment yield)(g):	3.24E+04	3.96E+03	7.09E+03	8.53E+03
Annual dis. conta. qt (based on runoff) (g):	1.22E+04	8.69E+03	1.32E+04	8.53E+03

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.31E+01	1.30E+01	1.34E+01	1.36E+01
Single storm adsorbed contaminant quantity PXi (g):	6.65E+01	1.03E+02	1.17E+03	1.30E+02
Annual adsorbed contaminant quantity (g):	1.04E+03	3.40E+02	1.94E+04	3.36E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.37E-01	1.52E-01	1.64E-01	1.64E-01
Single storm dissolved contaminant quantity PQi (g):	1.69E+02	3.04E+03	2.09E+03	1.71E+03
Annual dis. conta. qt (based on sediment yield)(g):	2.63E+03	1.00E+04	3.48E+04	4.41E+04
Annual dis. conta. qt (based on runoff) (g):	2.77E+03	5.04E+04	3.48E+04	2.93E+04

PADDYS RUN BASIN | CHEMICAL: CADMIUM | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date: 6/16/94 20:15

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.92E-04	9.23E-01	1.70E+05	2.00E-01	3.84E-05
Sub570	3.52E-04	1.98E+00	1.99E+05	9.68E-01	3.41E-04
Sub575	3.90E-05	1.36E-01	1.23E+05	2.62E-01	1.02E-05
Sub580	8.20E-05	1.01E-01	4.34E+04	1.28E-01	1.05E-05
Sub581	5.50E-05	6.99E-01	4.49E+05	9.06E-01	4.98E-05
Sub582	5.44E-05	5.66E-01	3.68E+05	4.35E-01	2.36E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.92E-04	9.23E-01	2.78E+00
Sub570	3.52E-04	1.98E+00	5.46E+00
sub575	3.90E-05	1.36E-01	5.78E-01
Sub 580, 581 & 582	5.61E-05	1.37E+00	7.77E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.42E-01	5.30E+00
D-D	3.42E-01	5.30E+00
E-E	3.42E-01	5.30E+00
Max:	3.42E-01	5.30E+00

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.51E-02
Avg. Conc. in GMR	1.51E-03
Max. Conc. in Paddys Run at GMR	2.82E-01
Max. Conc. in GMR at Paddys Run	2.83E-02
Max. Conc. in GMR at Eff. Line (max week)	2.76E-03
Annual Conc. at Eff. Line	3.14E-04
Max. Sed. Conc. in P.R. at GMR (mg/kg)	4.38E+00
Max. Sed. Conc. in GMR at P.R. (mg/kg)	4.40E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.90E-01	7.56E-04	5.62E-02
D-E	7.5	11.1	13.9		3.08E-01	3.38E-04	2.99E-02
E-F	0.7	1.6	1.1	1.5	6.02E-02	6.59E-05	6.80E-03
SSOD				56.6	7.73E-01	8.47E-04	4.59E-02
TOTAL					1.83E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.94E+01	6.01E-04	2.97E-04
D-E	2.16E+01	2.63E-04	1.30E-04
E-F	3.35E+00	4.08E-05	2.01E-05
SSOD	2.66E+01	3.24E-04	1.60E-04
TOTAL	1.01E+02	1.23E-03	6.06E-04

CPC SCREENING | CADMIUM RISK CRITERIA : 1.80E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.92E-04	YES	5.55E-02	YES	Sub580	8.20E-05	YES	4.59E-02	YES
Sub570	3.52E-04	YES	5.55E-02	YES	Sub581	5.50E-05	YES	4.59E-02	YES
Sub575	3.90E-05	YES	3.90E-02	YES	Sub582	5.44E-05	YES	4.59E-02	YES

CHEMICAL: CADMIUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.78E+00	2.90E+00	5.46E+00	5.78E-01
Single storm adsorbed contaminant quantity PXi (g):	2.60E+01	1.22E+01	2.43E+01	1.28E+00
Annual adsorbed contaminant quantity (g):	1.13E+03	9.25E+01	2.18E+02	2.14E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.92E-04	2.04E-04	3.52E-04	3.90E-05
Single storm dissolved contaminant quantity PQi (g):	9.23E-01	6.94E-01	1.98E+00	1.36E-01
Annual dis. conta. qt (based on sediment yield)(g):	4.00E+01	5.26E+00	1.78E+01	2.27E+00
Annual dis. conta. qt (based on runoff) (g):	1.51E+01	1.16E+01	3.32E+01	2.27E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.30E+00	4.47E+00	7.48E-01	7.50E-01
Single storm adsorbed contaminant quantity PXi (g):	6.62E+00	3.54E+01	6.50E+01	7.18E+00
Annual adsorbed contaminant quantity (g):	1.03E+02	1.17E+02	1.08E+03	1.85E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	8.20E-05	3.13E-04	5.50E-05	5.44E-05
Single storm dissolved contaminant quantity PQi (g):	1.01E-01	6.26E+00	6.99E-01	5.66E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.57E+00	2.06E+01	1.16E+01	1.46E+01
Annual dis. conta. qt (based on runoff) (g):	1.66E+00	1.04E+02	1.16E+01	9.70E+00

PADDYS RUN BASIN | CHEMICAL: CHROMIUM | SCENARIO: WITH STORMWATER CONTROLS
Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:16

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.16E-04	2.00E+00	1.70E+05	2.00E-01	8.31E-05
Sub570	3.60E-04	2.03E+00	1.99E+05	9.68E-01	3.49E-04
Sub575	3.02E-04	1.05E+00	1.23E+05	2.62E-01	7.91E-05
Sub580	2.38E-04	2.92E-01	4.34E+04	1.28E-01	3.04E-05
Sub581	3.85E-04	4.90E+00	4.49E+05	9.06E-01	3.49E-04
Sub582	3.32E-04	3.46E+00	3.68E+05	4.35E-01	1.44E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.16E-04	2.00E+00	1.81E+01
Sub570	3.60E-04	2.03E+00	1.68E+01
sub575	3.02E-04	1.05E+00	1.34E+01
Sub 580, 581 & 582	3.55E-04	8.64E+00	1.46E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.51E-01	1.64E+01
D-D	3.51E-01	1.64E+01
E-E	3.56E-01	1.64E+01
Max:	3.56E-01	1.64E+01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	4.70E-02
Avg. Conc. in GMR	4.72E-03
Max. Conc. in Paddys Run at GMR	2.94E-01
Max. Conc. in GMR at Paddys Run	2.95E-02
Max. Conc. in GMR at Eff. Line (max week)	1.60E-02
Annual Conc. at Eff. Line	1.43E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.35E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.36E+00

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.24E-01	1.01E-03	7.53E-02
D-E	7.5	11.1	13.9		5.22E-01	5.71E-04	5.06E-02
E-F	0.7	1.6	1.1	1.5	1.88E-01	2.06E-04	2.12E-02
SSOD				56.6	4.89E+00	5.36E-03	2.90E-01
TOTAL					6.52E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	8.27E+01	1.01E-03	4.97E-04
D-E	4.72E+01	5.75E-04	2.84E-04
E-F	9.30E+00	1.13E-04	5.58E-05
SSOD	1.67E+02	2.04E-03	1.01E-03
TOTAL	3.07E+02	3.73E-03	1.84E-03

CPC SCREENING | CHROMIUM RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.16E-04	YES	8.48E-02	YES	Sub580	2.38E-04	YES	2.38E-01	YES
Sub570	3.60E-04	YES	8.48E-02	YES	Sub581	3.85E-04	YES	2.90E-01	YES
Sub575	3.02E-04	YES	8.48E-02	YES	Sub582	3.32E-04	YES	2.90E-01	YES

CHEMICAL: CHROMIUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.81E+01	1.26E+01	1.68E+01	1.34E+01
Single storm adsorbed contaminant quantity PXi (g):	1.69E+02	5.31E+01	7.46E+01	2.98E+01
Annual adsorbed contaminant quantity (g):	7.32E+03	4.03E+02	6.70E+02	4.98E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.16E-04	2.97E-04	3.60E-04	3.02E-04
Single storm dissolved contaminant quantity PQi (g):	2.00E+00	1.01E+00	2.03E+00	1.05E+00
Annual dis. conta. qt (based on sediment yield)(g):	8.66E+01	7.65E+00	1.82E+01	1.76E+01
Annual dis. conta. qt (based on runoff) (g):	3.27E+01	1.68E+01	3.40E+01	1.76E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.13E+01	3.13E+01	1.57E+01	1.37E+01
Single storm adsorbed contaminant quantity PXi (g):	5.76E+01	2.48E+02	1.37E+03	1.31E+02
Annual adsorbed contaminant quantity (g):	8.96E+02	8.18E+02	2.27E+04	3.39E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.38E-04	7.32E-04	3.85E-04	3.32E-04
Single storm dissolved contaminant quantity PQi (g):	2.92E-01	1.46E+01	4.90E+00	3.46E+00
Annual dis. conta. qt (based on sediment yield)(g):	4.55E+00	4.82E+01	8.14E+01	8.93E+01
Annual dis. conta. qt (based on runoff) (g):	4.80E+00	2.43E+02	8.14E+01	5.92E+01

PADDYS RUN BASIN | CHEMICAL: HEXAVALENT CHROMIUM | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 6/16/94 20:17

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.68E-03	8.08E+00	1.70E+05	2.00E-01	3.36E-04
Sub570	1.46E-03	8.20E+00	1.99E+05	9.68E-01	1.41E-03
Sub575	1.22E-03	4.24E+00	1.23E+05	2.62E-01	3.19E-04
Sub580	9.60E-04	1.18E+00	4.34E+04	1.28E-01	1.23E-04
Sub581	1.55E-03	1.98E+01	4.49E+05	9.06E-01	1.41E-03
Sub582	1.34E-03	1.40E+01	3.68E+05	4.35E-01	5.82E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.68E-03	8.08E+00	1.80E+00
Sub570	1.46E-03	8.20E+00	1.67E+00
sub575	1.22E-03	4.24E+00	1.34E+00
Sub 580, 581 & 582	1.43E-03	3.49E+01	1.46E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.42E+00	1.63E+00
D-D	1.42E+00	1.63E+00
E-E	1.44E+00	1.63E+00
Max:	1.44E+00	1.63E+00

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	1.90E-01
Avg. Conc. in GMR	1.90E-02
Max. Conc. in Paddys Run at GMR	1.19E+00
Max. Conc. in GMR at Paddys Run	1.19E-01
Max. Conc. in GMR at Eff. Line (max week)	4.71E-03
Annual Conc. at Eff. Line	1.13E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.35E+00
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.35E-01

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.73E+00	4.09E-03	3.04E-01
D-E	7.5	11.1	13.9		2.11E+00	2.31E-03	2.04E-01
E-F	0.7	1.6	1.1	1.5	7.58E-01	8.30E-04	8.56E-02
SSOD				56.6	1.98E+01	2.16E-02	1.17E+00
TOTAL					2.63E+01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.34E+02	4.07E-03	2.01E-03
D-E	1.91E+02	2.32E-03	1.15E-03
E-F	3.76E+01	4.57E-04	2.25E-04
SSOD	6.76E+02	8.23E-03	4.06E-03
TOTAL	1.24E+03	1.51E-02	7.43E-03

CPC SCREENING — HEXAVALENT CHROMIUM RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.68E-03	YES	3.42E-01	YES	Sub580	9.60E-04	YES	9.60E-01	YES
Sub570	1.46E-03	YES	3.42E-01	YES	Sub581	1.55E-03	YES	1.17E+00	YES
Sub575	1.22E-03	YES	3.42E-01	YES	Sub582	1.34E-03	YES	1.17E+00	YES

CHEMICAL: HEXAVALENT CHROMIUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.80E+00	1.26E+00	1.67E+00	1.34E+00
Single storm adsorbed contaminant quantity PXi (g):	1.68E+01	5.29E+00	7.43E+00	2.97E+00
Annual adsorbed contaminant quantity (g):	7.29E+02	4.02E+01	6.67E+01	4.96E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.68E-03	1.20E-03	1.46E-03	1.22E-03
Single storm dissolved contaminant quantity PQi (g):	8.08E+00	4.07E+00	8.20E+00	4.24E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.50E+02	3.09E+01	7.36E+01	7.09E+01
Annual dis. conta. qt (based on runoff) (g):	1.32E+02	6.79E+01	1.37E+02	7.09E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.13E+00	3.12E+00	1.57E+00	1.37E+00
Single storm adsorbed contaminant quantity PXi (g):	5.73E+00	2.47E+01	1.36E+02	1.31E+01
Annual adsorbed contaminant quantity (g):	8.93E+01	8.15E+01	2.26E+03	3.38E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.60E-04	2.96E-03	1.55E-03	1.34E-03
Single storm dissolved contaminant quantity PQi (g):	1.18E+00	5.91E+01	1.98E+01	1.40E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.84E+01	1.95E+02	3.29E+02	3.60E+02
Annual dis. conta. qt (based on runoff) (g):	1.94E+01	9.80E+02	3.29E+02	2.39E+02

PADDYS RUN BASIN | **CHEMICAL:** COPPER | **SCENARIO: WITH STORMWATER CONTROLS**

Baseline

SURFACE WATER MODEL INPUTS: Investigator DCW Date 6/16/94 20:19

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.03E-03	2.42E+01	1.70E+05	2.00E-01	1.01E-03
Sub570	5.85E-03	3.30E+01	1.99E+05	9.68E-01	5.66E-03
Sub575	3.55E-03	1.24E+01	1.23E+05	2.62E-01	9.30E-04
Sub580	3.63E-03	4.46E+00	4.34E+04	1.28E-01	4.65E-04
Sub581	2.29E-02	2.91E+02	4.49E+05	9.06E-01	2.08E-02
Sub582	5.47E-03	5.70E+01	3.68E+05	4.35E-01	2.38E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.03E-03	2.42E+01	1.82E+01
Sub570	5.85E-03	3.30E+01	2.27E+01
sub575	3.55E-03	1.24E+01	1.32E+01
Sub 580, 581 & 582	1.45E-02	3.53E+02	4.95E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.69E+00	2.21E+01
D-D	5.69E+00	2.21E+01
E-E	1.08E+01	3.82E+01
Max:	1.08E+01	3.82E+01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.45E+00
Avg. Conc. in GMR	1.45E-01
Max. Conc. in Paddys Run at GMR	8.96E+00
Max. Conc. in GMR at Paddys Run	8.99E-01
Max. Conc. in GMR at Eff. Line (max week)	4.35E-02
Annual Conc. at Eff. Line	7.37E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.15E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.17E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.33E+01	1.46E-02	1.08E+00
D-E	7.5	11.1	13.9		7.19E+00	7.88E-03	6.98E-01
E-F	0.7	1.6	1.1	1.5	6.12E+00	6.71E-03	6.92E-01
SSOD				56.6	2.00E+02	2.19E-01	1.18E+01
TOTAL					2.26E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.09E+03	1.33E-02	6.55E-03
D-E	6.06E+02	7.38E-03	3.64E-03
E-F	2.26E+02	2.75E-03	1.36E-03
SSOD	6.08E+03	7.40E-02	3.65E-02
TOTAL	8.00E+03	9.75E-02	4.81E-02

CPC SCREENING | **COPPER RISK CRITERIA :** 1.40E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.03E-03	YES	1.19E+00	YES	Sub580	3.63E-03	YES	3.63E+00	YES
Sub570	5.85E-03	YES	1.19E+00	YES	Sub581	2.29E-02	YES	1.18E+01	YES
Sub575	3.55E-03	YES	1.19E+00	YES	Sub582	5.47E-03	YES	5.47E+00	YES

CHEMICAL: COPPER Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.82E+01	1.60E+01	2.27E+01	1.32E+01
Single storm adsorbed contaminant quantity PXi (g):	1.71E+02	6.72E+01	1.01E+02	2.92E+01
Annual adsorbed contaminant quantity (g):	7.38E+03	5.10E+02	9.06E+02	4.88E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.03E-03	4.50E-03	5.85E-03	3.55E-03
Single storm dissolved contaminant quantity PQi (g):	2.42E+01	1.53E+01	3.30E+01	1.24E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.05E+03	1.16E+02	2.96E+02	2.07E+02
Annual dis. conta. qt (based on runoff) (g):	3.96E+02	2.55E+02	5.52E+02	2.07E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.44E+01	5.75E+01	7.79E+01	1.89E+01
Single storm adsorbed contaminant quantity PXi (g):	7.33E+01	4.56E+02	6.77E+03	1.81E+02
Annual adsorbed contaminant quantity (g):	1.14E+03	1.50E+03	1.13E+05	4.67E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.63E-03	1.61E-02	2.29E-02	5.47E-03
Single storm dissolved contaminant quantity PQi (g):	4.46E+00	3.22E+02	2.91E+02	5.70E+01
Annual dis. conta. qt (based on sediment yield)(g):	6.95E+01	1.06E+03	4.84E+03	1.47E+03
Annual dis. conta. qt (based on runoff) (g):	7.33E+01	5.35E+03	4.84E+03	9.77E+02

PADDYS RUN BASIN | CHEMICAL: CYANIDE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:20

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.04E-01	4.98E+02	1.70E+05	2.00E-01	2.07E-02
Sub570	8.24E-02	4.64E+02	1.99E+05	9.68E-01	7.98E-02
Sub575	7.23E-02	2.52E+02	1.23E+05	2.62E-01	1.89E-02
Sub580	5.33E-02	6.56E+01	4.34E+04	1.28E-01	6.83E-03
Sub581	1.88E-01	2.39E+03	4.49E+05	9.06E-01	1.71E-01
Sub582	9.21E-02	9.60E+02	3.68E+05	4.35E-01	4.01E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.04E-01	4.98E+02	3.80E-02
Sub570	8.24E-02	4.64E+02	3.26E-02
sub575	7.23E-02	2.52E+02	2.72E-02
Sub 580, 581 & 582	1.40E-01	3.42E+03	4.74E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.04E+01	3.18E-02
D-D	8.04E+01	3.18E-02
E-E	1.16E+02	4.11E-02
Max:	1.16E+02	4.11E-02

Leading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.20E+02	2.41E-01	1.79E+01
D-E	7.5	11.1	13.9		1.24E+02	1.36E-01	1.20E+01
E-F	0.7	1.6	1.1	1.5	6.50E+01	7.12E-02	7.34E+00
SSOD				56.6	1.94E+03	2:12E+00	1.15E+02
TOTAL					2.34E+03		

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.59E+01
Avg. Conc. in GMR	1.59E+00
Max. Conc. in Paddys Run at GMR	9.57E+01
Max. Conc. in GMR at Paddys Run	9.61E+00
Max. Conc. in GMR at Eff. Line (max week)	1.51E-01
Annual Conc. at Eff. Line	4.79E-02
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.40E-02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.41E-03

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.02E+04	2.45E-01	1.21E-01
D-E	1.14E+04	1.39E-01	6.86E-02
E-F	2.83E+03	3.44E-02	1.70E-02
SSOD	6.26E+04	7.62E-01	3.76E-01
TOTAL	9.70E+04	1.18E+00	5.82E-01

CPC SCREENING — CYANIDE RISK CRITERIA : 7.30E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.04E-01	NO	2.02E+01	YES	Sub580	5.33E-02	YES	5.33E+01	YES
Sub570	8.24E-02	NO	2.02E+01	YES	Sub581	1.88E-01	NO	1.15E+02	NO
Sub575	7.23E-02	YES	2.02E+01	YES	Sub582	9.21E-02	NO	9.21E+01	NO

CHEMICAL: CYANIDE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.80E-02	2.39E-02	3.26E-02	2.72E-02
Single storm adsorbed contaminant quantity PXi (g):	3.56E-01	1.01E-01	1.45E-01	6.03E-02
Annual adsorbed contaminant quantity (g):	1.54E+01	7.65E-01	1.30E+00	1.01E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.04E-01	6.79E-02	8.24E-02	7.23E-02
Single storm dissolved contaminant quantity PQi (g):	4.98E+02	2.31E+02	4.64E+02	2.52E+02
Annual dis. conta. qt (based on sediment yield)(g):	2.16E+04	1.75E+03	4.17E+03	4.21E+03
Annual dis. conta. qt (based on runoff) (g):	8.14E+03	3.85E+03	7.78E+03	4.21E+03

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.15E-02	4.88E-02	6.36E-02	3.07E-02
Single storm adsorbed contaminant quantity PXi (g):	1.09E-01	3.87E-01	5.53E+00	2.94E-01
Annual adsorbed contaminant quantity (g):	1.70E+00	1.27E+00	9.19E+01	7.59E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.33E-02	1.38E-01	1.88E-01	9.21E-02
Single storm dissolved contaminant quantity PQi (g):	6.56E+01	2.75E+03	2.39E+03	9.60E+02
Annual dis. conta. qt (based on sediment yield)(g):	1.02E+03	9.07E+03	3.98E+04	2.48E+04
Annual dis. conta. qt (based on runoff) (g):	1.08E+03	4.56E+04	3.98E+04	1.64E+04

PADDYS RUN BASIN | CHEMICAL: LEAD | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 6/16/94 20:21

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.66E-04	3.21E+00	1.70E+05	2.00E-01	1.33E-04
Sub570	2.71E-04	1.53E+00	1.99E+05	9.68E-01	2.62E-04
Sub575	2.45E-04	8.54E-01	1.23E+05	2.62E-01	6.43E-05
Sub580	5.76E-04	7.08E-01	4.34E+04	1.28E-01	7.38E-05
Sub581	2.03E-02	2.58E+02	4.49E+05	9.06E-01	1.84E-02
Sub582	2.79E-04	2.91E+00	3.68E+05	4.35E-01	1.21E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.66E-04	3.21E+00	5.79E+01
Sub570	2.71E-04	1.53E+00	2.52E+01
sub575	2.45E-04	8.54E-01	2.18E+01
Sub 580, 581 & 582	1.07E-02	2.61E+02	8.76E+02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.66E-01	2.48E+01
D-D	2.66E-01	2.48E+01
E-E	6.36E+00	5.21E+02
Max:	6.36E+00	5.21E+02

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	9.14E-01
Avg. Conc. in GMR	9.17E-02
Max. Conc. in Paddys Run at GMR	5.25E+00
Max. Conc. in GMR at Paddys Run	5.27E-01
Max. Conc. in GMR at Eff. Line (max week)	4.16E-02
Annual Conc. at Eff. Line	3.29E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	4.30E+02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	4.32E+01

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.05E+00	1.15E-03	8.52E-02
D-E	7.5	11.1	13.9		5.29E-01	5.79E-04	5.13E-02
E-F	0.7	1.6	1.1	1.5	3.98E+00	4.36E-03	4.49E-01
SSOD				56.6	1.48E+02	1.62E-01	8.78E+00
TOTAL					1.53E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.14E+02	1.39E-03	6.85E-04
D-E	5.53E+01	6.74E-04	3.32E-04
E-F	1.16E+02	1.41E-03	6.94E-04
SSOD	4.15E+03	5.06E-02	2.49E-02
TOTAL	4.44E+03	5.40E-02	2.66E-02

CPC SCREENING | LEAD RISK CRITERIA : 1.50E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.66E-04	YES	9.20E-02	YES	Sub580	5.76E-04	YES	5.76E-01	YES
Sub570	2.71E-04	YES	9.20E-02	YES	Sub581	2.03E-02	NO	8.78E+00	NO
Sub575	2.45E-04	YES	9.20E-02	YES	Sub582	2.79E-04	YES	2.79E-01	YES

CHEMICAL: LEAD Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.79E+01	2.18E+01	2.52E+01	2.18E+01
Single storm adsorbed contaminant quantity PXi (g):	5.42E+02	9.16E+01	1.12E+02	4.84E+01
Annual adsorbed contaminant quantity (g):	2.35E+04	6.95E+02	1.01E+03	8.09E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.66E-04	2.56E-04	2.71E-04	2.45E-04
Single storm dissolved contaminant quantity PQi (g):	3.21E+00	8.69E-01	1.53E+00	8.54E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.39E+02	6.59E+00	1.37E+01	1.43E+01
Annual dis. conta. qt (based on runoff) (g):	5.24E+01	1.45E+01	2.56E+01	1.43E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.48E+01	8.96E+01	1.65E+03	2.31E+01
Single storm adsorbed contaminant quantity PXi (g):	2.79E+02	7.10E+02	1.44E+05	2.21E+02
Annual adsorbed contaminant quantity (g):	4.35E+03	2.34E+03	2.39E+06	5.71E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.76E-04	1.05E-03	2.03E-02	2.79E-04
Single storm dissolved contaminant quantity PQi (g):	7.08E-01	2.09E+01	2.58E+02	2.91E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.10E+01	6.89E+01	4.29E+03	7.51E+01
Annual dis. conta. qt (based on runoff) (g):	1.16E+01	3.47E+02	4.29E+03	4.98E+01

PADDYS RUN BASIN | CHEMICAL: MAGNESIUM | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 6/16/94 20:22

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.32E+02	1.12E+06	1.70E+05	2.00E-01	4.64E+01
Sub570	1.33E+02	7.49E+05	1.99E+05	9.68E-01	1.29E+02
Sub575	1.69E+02	5.88E+05	1.23E+05	2.62E-01	4.42E+01
Sub580	6.01E+01	7.39E+04	4.34E+04	1.28E-01	7.69E+00
Sub581	2.57E+02	3.27E+06	4.49E+05	9.06E-01	2.33E+02
Sub582	1.37E+02	1.43E+06	3.68E+05	4.35E-01	5.95E+01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	2.32E+02	1.12E+06	3.02E+04
Sub570	1.33E+02	7.49E+05	1.86E+04
sub575	1.69E+02	5.88E+05	2.25E+04
Sub 580, 581 & 582	1.96E+02	4.77E+06	2.41E+04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	1.30E+05	1.82E+04
D-D	1.30E+05	1.82E+04
E-E	1.69E+05	2.18E+04
Max:	1.69E+05	2.18E+04

Great Miami River

	ug/l
Avg. Conc. in Paddys Run at GMR	2.47E+04
Avg. Conc. in GMR	2.48E+03
Max. Conc. in Paddys Run at GMR	1.40E+05
Max. Conc. in GMR at Paddys Run	1.40E+04
Max. Conc. in GMR at Eff. Line (max week)	2.54E+02
Annual Conc. at Eff. Line	7.74E+01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.80E+04
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.80E+03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta88	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.19E+05	4.59E+02	3.41E+04
D-E	7.5	11.1	13.9		2.49E+05	2.73E+02	2.41E+04
E-F	0.7	1.6	1.1	1.5	9.78E+04	1.07E+02	1.10E+04
SSOD				56.6	2.70E+06	2.96E+03	1.60E+05
TOTAL					3.46E+06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.20E+07	5.12E+02	2.52E+02
D-E	2.46E+07	2.99E+02	1.48E+02
E-F	4.75E+06	5.79E+01	2.85E+01
SSOD	8.60E+07	1.07E+03	5.29E+02
TOTAL	1.59E+08	1.94E+03	9.57E+02

CPC SCREENING | MAGNESIUM RISK CRITERIA : 3.50E+04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.32E+02	NO	3.98E+04	NO	Sub580	6.01E+01	NO	6.01E+04	NO
Sub570	1.33E+02	NO	3.98E+04	NO	Sub581	2.57E+02	NO	1.60E+05	NO
Sub575	1.69E+02	NO	3.98E+04	NO	Sub582	1.37E+02	NO	1.37E+05	NO

CHEMICAL: MAGNESIUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.02E+04	9.85E+03	1.86E+04	2.25E+04
Single storm adsorbed contaminant quantity PXi (g):	2.83E+05	4.15E+04	8.26E+04	5.00E+04
Annual adsorbed contaminant quantity (g):	1.23E+07	3.15E+05	7.41E+05	8.36E+05
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.32E+02	7.72E+01	1.33E+02	1.69E+02
Single storm dissolved contaminant quantity PQi (g):	1.12E+06	2.62E+05	7.49E+05	5.88E+05
Annual dis. conta. qt (based on sediment yield)(g):	4.83E+07	1.99E+06	6.73E+06	9.83E+06
Annual dis. conta. qt (based on runoff) (g):	1.82E+07	4.37E+06	1.26E+07	9.83E+06

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.57E+03	2.88E+04	3.15E+04	1.70E+04
Single storm adsorbed contaminant quantity PXi (g):	4.37E+04	2.28E+05	2.74E+06	1.63E+05
Annual adsorbed contaminant quantity (g):	6.80E+05	7.53E+05	4.55E+07	4.20E+06
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.01E+01	2.25E+02	2.57E+02	1.37E+02
Single storm dissolved contaminant quantity PQi (g):	7.39E+04	4.49E+06	3.27E+06	1.43E+06
Annual dis. conta. qt (based on sediment yield)(g):	1.15E+06	1.48E+07	5.43E+07	3.68E+07
Annual dis. conta. qt (based on runoff) (g):	1.21E+06	7.44E+07	5.43E+07	2.44E+07

PADDYS RUN BASIN | CHEMICAL: MANGANESE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:24

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.63E-01	7.85E+02	1.70E+05	2.00E-01	3.26E-02
Sub570	1.27E-01	7.17E+02	1.99E+05	9.68E-01	1.23E-01
Sub575	2.34E-01	8.14E+02	1.23E+05	2.62E-01	6.13E-02
Sub580	7.76E-02	9.54E+01	4.34E+04	1.28E-01	9.93E-03
Sub581	5.87E-01	7.47E+03	4.49E+05	9.06E-01	5.32E-01
Sub582	1.24E-01	1.30E+03	3.68E+05	4.35E-01	5.41E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.63E-01	7.85E+02	8.50E+02
Sub570	1.27E-01	7.17E+02	7.11E+02
sub575	2.34E-01	8.14E+02	1.25E+03
Sub 580, 581 & 582	3.64E-01	8.86E+03	1.79E+03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.24E+02	6.93E+02
D-D	1.24E+02	6.93E+02
E-E	2.64E+02	1.34E+03
Max:	2.64E+02	1.34E+03

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	3.83E+01
Avg. Conc. in GMR	3.84E+00
Max. Conc. in Paddys Run at GMR	2.18E+02
Max. Conc. in GMR at Paddys Run	2.19E+01
Max. Conc. in GMR at Eff. Line (max week)	7.92E-01
Annual Conc. at Eff. Line	1.21E-01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.10E+03
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.11E+02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgmw per cell (ug/l)
C-D	20.6	25.2			3.42E+02	3.75E-01	2.79E+01
D-E	7.5	11.1	13.9		2.52E+02	2.76E-01	2.44E+01
E-F	0.7	1.6	1.1	1.5	1.59E+02	1.74E-01	1.79E+01
SSOD				56.6	5.01E+03	5.49E+00	2.98E+02
TOTAL					5.77E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.16E+04	3.85E-01	1.90E-01
D-E	2.41E+04	2.93E-01	1.44E-01
E-F	6.33E+03	7.71E-02	3.80E-02
SSOD	1.51E+05	1.84E+00	9.10E-01
TOTAL	2.13E+05	2.60E+00	1.28E+00

CPC SCREENING — MANGANESE RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.63E-01	NO	3.65E+01	NO	Sub580	7.76E-02	NO	7.76E+01	NO
Sub570	1.27E-01	NO	3.65E+01	NO	Sub581	5.87E-01	NO	2.98E+02	NO
Sub575	2.34E-01	NO	3.65E+01	NO	Sub582	1.24E-01	NO	1.24E+02	NO

CHEMICAL: MANGANESE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.50E+02	8.24E+02	7.11E+02	1.25E+03
Single storm adsorbed contaminant quantity PXi (g):	7.96E+03	3.47E+03	3.16E+03	2.77E+03
Annual adsorbed contaminant quantity (g):	3.45E+05	2.63E+04	2.84E+04	4.63E+04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.63E-01	1.61E-01	1.27E-01	2.34E-01
Single storm dissolved contaminant quantity PQi (g):	7.85E+02	5.49E+02	7.17E+02	8.14E+02
Annual dis. conta. qt (based on sediment yield)(g):	3.40E+04	4.16E+03	6.44E+03	1.36E+04
Annual dis. conta. qt (based on runoff) (g):	1.28E+04	9.15E+03	1.20E+04	1.36E+04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.43E+02	9.87E+02	2.88E+03	6.18E+02
Single storm adsorbed contaminant quantity PXi (g):	2.26E+03	7.82E+03	2.50E+05	5.91E+03
Annual adsorbed contaminant quantity (g):	3.51E+04	2.58E+04	4.16E+06	1.53E+05
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.76E-02	1.92E-01	5.87E-01	1.24E-01
Single storm dissolved contaminant quantity PQi (g):	9.54E+01	3.84E+03	7.47E+03	1.30E+03
Annual dis. conta. qt (based on sediment yield)(g):	1.48E+03	1.27E+04	1.24E+05	3.35E+04
Annual dis. conta. qt (based on runoff) (g):	1.57E+03	6.37E+04	1.24E+05	2.22E+04

PADDYS RUN BASIN | CHEMICAL: MERCURY | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:25

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.02E-03	4.91E+00	1.70E+05	2.00E-01	2.04E-04
Sub570	8.18E-04	4.61E+00	1.99E+05	9.68E-01	7.92E-04
Sub575	9.97E-04	3.47E+00	1.23E+05	2.62E-01	2.61E-04
Sub580	9.33E-04	1.15E+00	4.34E+04	1.28E-01	1.19E-04
Sub581	1.64E-03	2.08E+01	4.49E+05	9.06E-01	1.48E-03
Sub582	1.07E-03	1.11E+01	3.68E+05	4.35E-01	4.65E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	1.02E-03	4.91E+00	2.96E-01
Sub570	8.18E-04	4.61E+00	2.54E-01
sub575	9.97E-04	3.47E+00	2.95E-01
Sub 580, 581 & 582	1.36E-03	3.31E+01	3.74E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	7.98E-01	2.48E-01
D-D	7.98E-01	2.48E-01
E-E	1.13E+00	3.23E-01
Max:	1.13E+00	3.23E-01

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	1.58E-01
Avg. Conc. in GMR	1.58E-02
Max. Conc. in Paddys Run at GMR	9.34E-01
Max. Conc. in GMR at Paddys Run	9.37E-02
Max. Conc. in GMR at Eff. Line (max week)	2.25E-03
Annual Conc. at Eff. Line	6.55E-04
Max. Sed. Conc. in P.R. at GMR (mg/kg)	2.67E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	2.68E-02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from Δ Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.17E+00	2.38E-03	1.77E-01
D-E	7.5	11.1	13.9		1.36E+00	1.49E-03	1.32E-01
E-F	0.7	1.6	1.1	1.5	6.43E-01	7.04E-04	7.26E-02
SSOD				56.6	1.87E+01	2.05E-02	1.11E+00
TOTAL					2.29E+01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.99E+02	2.42E-03	1.20E-03
D-E	1.27E+02	1.55E-03	7.64E-04
E-F	2.92E+01	3.55E-04	1.75E-04
SSOD	6.22E+02	7.58E-03	3.74E-03
TOTAL	9.78E+02	1.19E-02	5.87E-03

CPC SCREENING | MERCURY RISK CRITERIA : 1.10E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.02E-03	YES	2.12E-01	YES	Sub580	9.33E-04	YES	9.33E-01	YES
Sub570	8.18E-04	YES	2.12E-01	YES	Sub581	1.64E-03	NO	1.11E+00	NO
Sub575	9.97E-04	YES	2.12E-01	YES	Sub582	1.07E-03	YES	1.07E+00	YES

CHEMICAL: MERCURY Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.96E-01	1.84E-01	2.54E-01	2.95E-01
Single storm adsorbed contaminant quantity PXi (g):	2.77E+00	7.77E-01	1.13E+00	6.55E-01
Annual adsorbed contaminant quantity (g):	1.20E+02	5.90E+00	1.01E+01	1.10E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.02E-03	6.50E-04	8.18E-04	9.97E-04
Single storm dissolved contaminant quantity PQi (g):	4.91E+00	2.21E+00	4.61E+00	3.47E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.13E+02	1.68E+01	4.14E+01	5.80E+01
Annual dis. conta. qt (based on runoff) (g):	8.02E+01	3.69E+01	7.73E+01	5.80E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.96E-01	5.34E-01	4.45E-01	2.95E-01
Single storm adsorbed contaminant quantity PXi (g):	1.51E+00	4.23E+00	3.87E+01	2.82E+00
Annual adsorbed contaminant quantity (g):	2.35E+01	1.39E+01	6.44E+02	7.30E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.33E-04	1.87E-03	1.64E-03	1.07E-03
Single storm dissolved contaminant quantity PQi (g):	1.15E+00	3.74E+01	2.08E+01	1.11E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.79E+01	1.23E+02	3.46E+02	2.88E+02
Annual dis. conta. qt (based on runoff) (g):	1.88E+01	6.20E+02	3.46E+02	1.91E+02

PADDYS RUN BASIN | CHEMICAL: MOLYBDENUM | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:26

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.56E-03	2.20E+01	1.70E+05	2.00E-01	9.13E-04
Sub570	1.63E-03	9.20E+00	1.99E+05	9.68E-01	1.58E-03
Sub575	1.01E-03	3.52E+00	1.23E+05	2.62E-01	2.65E-04
Sub580	9.45E-04	1.16E+00	4.34E+04	1.28E-01	1.21E-04
Sub581	1.18E-03	1.50E+01	4.49E+05	9.06E-01	1.07E-03
Sub582	2.58E-03	2.69E+01	3.68E+05	4.35E-01	1.12E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.56E-03	2.20E+01	1.19E+01
Sub570	1.63E-03	9.20E+00	4.56E+00
sub575	1.01E-03	3.52E+00	2.70E+00
Sub 580, 581 & 582	1.77E-03	4.31E+01	4.39E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.61E+00	4.49E+00
D-D	1.61E+00	4.49E+00
E-E	1.71E+00	4.49E+00
Max:	1.71E+00	4.49E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	2.66E-01
Avg. Conc. in GMR	2.67E-02
Max. Conc. in Paddys Run at GMR	1.42E+00
Max. Conc. in GMR at Paddys Run	1.42E-01
Max. Conc. in GMR at Eff. Line (max week)	5.49E-03
Annual Conc. at Eff. Line	1.04E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.71E+00
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.72E-01

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.84E+00	7.50E-03	5.58E-01
D-E	7.5	11.1	13.9		3.16E+00	3.46E-03	3.06E-01
E-F	0.7	1.6	1.1	1.5	9.86E-01	1.08E-03	1.11E-01
SSOD				56.6	2.44E+01	2.67E-02	1.45E+00
TOTAL					3.54E+01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.68E+02	9.35E-03	4.61E-03
D-E	3.39E+02	4.13E-03	2.03E-03
E-F	5.84E+01	7.11E-04	3.51E-04
SSOD	9.22E+02	1.12E-02	5.54E-03
TOTAL	2.09E+03	2.54E-02	1.25E-02

CPC SCREENING | MOLYBDENUM RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.56E-03	YES	5.77E-01	YES	Sub580	9.45E-04	YES	9.45E-01	YES
Sub570	1.63E-03	YES	5.77E-01	YES	Sub581	1.18E-03	YES	1.18E+00	YES
Sub575	1.01E-03	YES	5.77E-01	YES	Sub582	2.58E-03	YES	1.45E+00	YES

CHEMICAL: MOLYBDENUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.19E+01	3.04E+00	4.56E+00	2.70E+00
Single storm adsorbed contaminant quantity PXi (g):	1.11E+02	1.28E+01	2.03E+01	5.98E+00
Annual adsorbed contaminant quantity (g):	4.82E+03	9.71E+01	1.82E+02	1.00E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.56E-03	1.19E-03	1.63E-03	1.01E-03
Single storm dissolved contaminant quantity PQi (g):	2.20E+01	4.04E+00	9.20E+00	3.52E+00
Annual dis. conta. qt (based on sediment yield)(g):	9.51E+02	3.07E+01	8.26E+01	5.88E+01
Annual dis. conta. qt (based on runoff) (g):	3.59E+02	6.74E+01	1.54E+02	5.88E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.70E+00	5.85E+00	2.89E+00	6.42E+00
Single storm adsorbed contaminant quantity PXi (g):	1.37E+01	4.63E+01	2.52E+02	6.14E+01
Annual adsorbed contaminant quantity (g):	2.14E+02	1.53E+02	4.18E+03	1.59E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.45E-04	2.28E-03	1.18E-03	2.58E-03
Single storm dissolved contaminant quantity PQi (g):	1.16E+00	4.55E+01	1.50E+01	2.69E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.81E+01	1.50E+02	2.50E+02	6.96E+02
Annual dis. conta. qt (based on runoff) (g):	1.91E+01	7.55E+02	2.50E+02	4.61E+02

PADDYS RUN BASIN | CHEMICAL: NICKEL | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:27

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.05E-03	5.06E+00	1.70E+05	2.00E-01	2.10E-04
Sub570	1.14E-03	6.43E+00	1.99E+05	9.68E-01	1.11E-03
Sub575	7.87E-04	2.74E+00	1.23E+05	2.62E-01	2.06E-04
Sub580	6.36E-04	7.82E-01	4.34E+04	1.28E-01	8.14E-05
Sub581	1.22E-03	1.55E+01	4.49E+05	9.06E-01	1.10E-03
Sub582	1.02E-03	1.06E+01	3.68E+05	4.35E-01	4.43E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.05E-03	5.06E+00	1.98E+01
Sub570	1.14E-03	6.43E+00	2.30E+01
sub575	7.87E-04	2.74E+00	1.52E+01
Sub 580, 581 & 582	1.10E-03	2.69E+01	1.97E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.11E+00	2.24E+01
D-D	1.11E+00	2.24E+01
E-E	1.12E+00	2.24E+01
Max:	1.12E+00	2.24E+01

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	1.41E-01
Avg. Conc. in GMR	1.41E-02
Max. Conc. in Paddys Run at GMR	9.21E-01
Max. Conc. in GMR at Paddys Run	9.25E-02
Max. Conc. in GMR at Eff. Line (max week)	1.83E-02
Annual Conc. at Eff. Line	1.93E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.85E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.86E+00

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.66E+00	2.92E-03	2.17E-01
D-E	7.5	11.1	13.9		1.48E+00	1.62E-03	1.43E-01
E-F	0.7	1.6	1.1	1.5	5.72E-01	6.27E-04	6.46E-02
SSOD				56.6	1.52E+01	1.67E-02	9.04E-01
TOTAL					1.99E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.23E+02	2.72E-03	1.34E-03
D-E	1.27E+02	1.54E-03	7.62E-04
E-F	2.72E+01	3.31E-04	1.63E-04
SSOD	5.20E+02	6.33E-03	3.12E-03
TOTAL	8.97E+02	1.09E-02	5.39E-03

CPC SCREENING — NICKEL RISK CRITERIA : 7.30E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.05E-03	YES	2.41E-01	YES	Sub580	6.36E-04	YES	6.36E-01	YES
Sub570	1.14E-03	YES	2.41E-01	YES	Sub581	1.22E-03	YES	9.04E-01	YES
Sub575	7.87E-04	YES	2.41E-01	YES	Sub582	1.02E-03	YES	9.04E-01	YES

CHEMICAL: NICKEL Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.98E+01	1.64E+01	2.30E+01	1.52E+01
Single storm adsorbed contaminant quantity PXi (g):	1.85E+02	6.93E+01	1.02E+02	3.37E+01
Annual adsorbed contaminant quantity (g):	8.02E+03	5.25E+02	9.20E+02	5.63E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.05E-03	8.92E-04	1.14E-03	7.87E-04
Single storm dissolved contaminant quantity PQi (g):	5.06E+00	3.03E+00	6.43E+00	2.74E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.19E+02	2.30E+01	5.78E+01	4.58E+01
Annual dis. conta. qt (based on runoff) (g):	8.27E+01	5.05E+01	1.08E+02	4.58E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.31E+01	3.23E+01	2.16E+01	1.83E+01
Single storm adsorbed contaminant quantity PXi (g):	6.67E+01	2.56E+02	1.88E+03	1.75E+02
Annual adsorbed contaminant quantity (g):	1.04E+03	8.43E+02	3.12E+04	4.52E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.36E-04	1.74E-03	1.22E-03	1.02E-03
Single storm dissolved contaminant quantity PQi (g):	7.82E-01	3.48E+01	1.55E+01	1.06E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.22E+01	1.15E+02	2.58E+02	2.74E+02
Annual dis. conta. qt (based on runoff) (g):	1.28E+01	5.77E+02	2.58E+02	1.82E+02

PADDYS RUN BASIN | CHEMICAL: SILVER | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:29

Subbasin	Co Dissolved Conc. (mg/l)	PGi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.47E-03	7.09E+00	1.70E+05	2.00E-01	2.94E-04
Sub570	1.38E-03	7.75E+00	1.99E+05	9.68E-01	1.33E-03
Sub575	8.88E-05	3.09E-01	1.23E+05	2.62E-01	2.33E-05
Sub580	7.88E-05	9.69E-02	4.34E+04	1.28E-01	1.01E-05
Sub581	9.68E-04	1.23E+01	4.49E+05	9.06E-01	8.77E-04
Sub582	9.05E-05	9.43E-01	3.68E+05	4.35E-01	3.94E-05

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.47E-03	7.09E+00	7.68E+00
Sub570	1.38E-03	7.75E+00	7.69E+00
sub575	8.88E-05	3.09E-01	4.74E-01
Sub 580, 581 & 582	5.48E-04	1.33E+01	2.69E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.34E+00	7.49E+00
D-D	1.34E+00	7.49E+00
E-E	1.34E+00	7.49E+00
Max:	1.34E+00	7.49E+00

Great Miami River

	ug/l
Avg. Conc. in Paddys Run at GMR	9.76E-02
Avg. Conc. in GMR	9.79E-03
Max. Conc. in Paddys Run at GMR	1.11E+00
Max. Conc. in GMR at Paddys Run	1.11E-01
Max. Conc. in GMR at Eff. Line (max week)	4.43E-03
Annual Conc. at Eff. Line	6.78E-04
Max. Sed. Conc. in P.R. at GMR (mg/kg)	6.19E+00
Max. Sed. Conc. in GMR at P.R. (mg/kg)	6.21E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.41E+00	3.74E-03	2.78E-01
D-E	7.5	11.1	13.9		1.43E+00	1.57E-03	1.39E-01
E-F	0.7	1.6	1.1	1.5	3.77E-01	4.13E-04	4.26E-02
SSOD				56.6	7.55E+00	8.28E-03	4.48E-01
TOTAL					1.28E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.99E+02	3.64E-03	1.80E-03
D-E	1.20E+02	1.46E-03	7.19E-04
E-F	1.95E+01	2.37E-04	1.17E-04
SSOD	2.19E+02	2.67E-03	1.32E-03
TOTAL	6.57E+02	8.00E-03	3.95E-03

CPC SCREENING | SILVER RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.47E-03	YES	2.70E-01	YES	Sub580	7.88E-05	YES	7.88E-02	YES
Sub570	1.38E-03	YES	2.70E-01	YES	Sub581	9.68E-04	YES	4.48E-01	YES
Sub575	8.88E-05	YES	8.88E-02	YES	Sub582	9.05E-05	YES	9.05E-02	YES

CHEMICAL: SILVER Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.68E+00	4.37E+00	7.69E+00	4.74E-01
Single storm adsorbed contaminant quantity PXi (g):	7.18E+01	1.84E+01	3.42E+01	1.05E+00
Annual adsorbed contaminant quantity (g):	3.11E+03	1.40E+02	3.07E+02	1.76E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.47E-03	8.57E-04	1.38E-03	8.88E-05
Single storm dissolved contaminant quantity PQi (g):	7.09E+00	2.91E+00	7.75E+00	3.09E-01
Annual dis. conta. qt (based on sediment yield)(g):	3.07E+02	2.21E+01	6.96E+01	5.17E+00
Annual dis. conta. qt (based on runoff) (g):	1.16E+02	4.85E+01	1.30E+02	5.17E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.50E-01	5.62E+00	4.74E+00	4.50E-01
Single storm adsorbed contaminant quantity PXi (g):	2.29E+00	4.45E+01	4.12E+02	4.30E+00
Annual adsorbed contaminant quantity (g):	3.57E+01	1.47E+02	6.85E+03	1.11E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.88E-05	1.09E-03	9.68E-04	9.05E-05
Single storm dissolved contaminant quantity PQi (g):	9.69E-02	2.19E+01	1.23E+01	9.43E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.51E+00	7.21E+01	2.05E+02	2.44E+01
Annual dis. conta. qt (based on runoff) (g):	1.59E+00	3.63E+02	2.05E+02	1.62E+01

PADDYS RUN BASIN | **CHEMICAL:** THALLIUM | **SCENARIO: WITH STORMWATER CONTROLS**

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:30

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.50E-05	7.21E-02	1.70E+05	2.00E-01	3.00E-06
Sub570	8.35E-06	4.70E-02	1.99E+05	9.68E-01	8.08E-06
Sub575	1.30E-05	4.54E-02	1.23E+05	2.62E-01	3.42E-06
Sub580	1.22E-05	1.50E-02	4.34E+04	1.28E-01	1.56E-06
Sub581	1.66E-05	2.11E-01	4.49E+05	9.06E-01	1.50E-05
Sub582	7.88E-06	8.21E-02	3.68E+05	4.35E-01	3.43E-06

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	1.50E-05	7.21E-02	6.51E-01
Sub570	8.35E-06	4.70E-02	3.89E-01
sub575	1.30E-05	4.54E-02	5.80E-01
Sub 580, 581 & 582	1.26E-05	3.08E-01	5.22E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	8.17E-03	3.80E-01
D-D	8.17E-03	3.80E-01
E-E	1.08E-02	4.66E-01
Max:	1.08E-02	4.66E-01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.62E-03
Avg. Conc. in GMR	1.62E-04
Max. Conc. in Paddys Run at GMR	8.94E-03
Max. Conc. in GMR at Paddys Run	8.98E-04
Max. Conc. in GMR at Eff. Line (max week)	2.65E-04
Annual Conc. at Eff. Line	2.76E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.84E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.86E-02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.67E-02	2.93E-05	2.18E-03
D-E	7.5	11.1	13.9		1.69E-02	1.86E-05	1.64E-03
E-F	0.7	1.6	1.1	1.5	6.37E-03	6.98E-06	7.20E-04
SSOD				56.6	1.74E-01	1.91E-04	1.03E-02
TOTAL					2.24E-01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.70E+00	3.29E-05	1.62E-05
D-E	1.69E+00	2.06E-05	1.01E-05
E-F	3.12E-01	3.80E-06	1.87E-06
SSOD	5.59E+00	6.81E-05	3.36E-05
TOTAL	1.03E+01	1.25E-04	6.18E-05

CPC SCREENING | **THALLIUM RISK CRITERIA :** 2.60E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.50E-05	YES	2.63E-03	YES	Sub580	1.22E-05	YES	1.03E-02	YES
Sub570	8.35E-06	YES	2.63E-03	YES	Sub581	1.66E-05	YES	1.03E-02	YES
Sub575	1.30E-05	YES	2.63E-03	YES	Sub582	7.88E-06	YES	7.88E-03	YES

CHEMICAL: THALLIUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.51E-01	4.55E-01	3.89E-01	5.80E-01
Single storm adsorbed contaminant quantity PXi (g):	6.10E+00	1.92E+00	1.73E+00	1.29E+00
Annual adsorbed contaminant quantity (g):	2.64E+02	1.45E+01	1.55E+01	2.15E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.50E-05	1.07E-05	8.35E-06	1.30E-05
Single storm dissolved contaminant quantity PQi (g):	7.21E-02	3.63E-02	4.70E-02	4.54E-02
Annual dis. conta. qt (based on sediment yield)(g):	3.12E+00	2.76E-01	4.22E-01	7.59E-01
Annual dis. conta. qt (based on runoff) (g):	1.18E+00	6.06E-01	7.88E-01	7.59E-01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.80E-01	3.93E-01	6.76E-01	3.26E-01
Single storm adsorbed contaminant quantity PXi (g):	2.96E+00	3.11E+00	5.88E+01	3.12E+00
Annual adsorbed contaminant quantity (g):	4.60E+01	1.03E+01	9.78E+02	8.06E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.22E-05	9.18E-06	1.66E-05	7.88E-06
Single storm dissolved contaminant quantity PQi (g):	1.50E-02	1.84E-01	2.11E-01	8.21E-02
Annual dis. conta. qt (based on sediment yield)(g):	2.33E-01	6.05E-01	3.50E+00	2.12E+00
Annual dis. conta. qt (based on runoff) (g):	2.46E-01	3.04E+00	3.50E+00	1.41E+00

PADDYS RUN BASIN | CHEMICAL: VANADIUM | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/16/94 20:32

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	8.86E-04	4.27E+00	1.70E+05	2.00E-01	1.77E-04
Sub570	9.83E-04	5.54E+00	1.99E+05	9.68E-01	9.52E-04
Sub575	8.73E-04	3.04E+00	1.23E+05	2.62E-01	2.29E-04
Sub580	7.10E-04	8.73E-01	4.34E+04	1.28E-01	9.09E-05
Sub581	9.99E-04	1.27E+01	4.49E+05	9.06E-01	9.05E-04
Sub582	8.40E-04	8.75E+00	3.68E+05	4.35E-01	3.65E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	8.86E-04	4.27E+00	2.57E+01
Sub570	9.83E-04	5.54E+00	3.05E+01
sub575	8.73E-04	3.04E+00	2.59E+01
Sub 580, 581 & 582	9.16E-04	2.23E+01	2.52E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.57E-01	2.97E+01
D-D	9.57E-01	2.97E+01
E-E	9.57E-01	2.97E+01
Max:	9.57E-01	2.97E+01

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	1.20E-01
Avg. Conc. in GMR	1.21E-02
Max. Conc. in Paddys Run at GMR	7.90E-01
Max. Conc. in GMR at Paddys Run	7.93E-02
Max. Conc. in GMR at Eff. Line (max week)	1.65E-02
Annual Conc. at Eff. Line	1.71E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	2.45E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	2.46E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub580	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.28E+00	2.49E-03	1.85E-01
D-E	7.5	11.1	13.9		1.36E+00	1.49E-03	1.32E-01
E-F	0.7	1.6	1.1	1.5	4.87E-01	5.33E-04	5.50E-02
SSOD				56.6	1.26E+01	1.38E-02	7.50E-01
TOTAL					1.68E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.89E+02	2.31E-03	1.14E-03
D-E	1.18E+02	1.44E-03	7.10E-04
E-F	2.37E+01	2.88E-04	1.42E-04
SSOD	4.31E+02	5.24E-03	2.59E-03
TOTAL	7.62E+02	9.28E-03	4.58E-03

CPC SCREENING | VANADIUM RISK CRITERIA : 2.60E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	8.86E-04	YES	2.14E-01	YES	Sub580	7.10E-04	YES	7.10E-01	YES
Sub570	9.83E-04	YES	2.14E-01	YES	Sub581	9.99E-04	YES	7.50E-01	YES
Sub575	8.73E-04	YES	2.14E-01	YES	Sub582	8.40E-04	YES	7.50E-01	YES

CHEMICAL: VANADIUM Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.57E+01	2.25E+01	3.05E+01	2.59E+01
Single storm adsorbed contaminant quantity PXi (g):	2.40E+02	9.46E+01	1.36E+02	5.74E+01
Annual adsorbed contaminant quantity (g):	1.04E+04	7.18E+02	1.22E+03	9.60E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	8.86E-04	7.92E-04	9.83E-04	8.73E-04
Single storm dissolved contaminant quantity PQi (g):	4.27E+00	2.69E+00	5.54E+00	3.04E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.85E+02	2.04E+01	4.98E+01	5.08E+01
Annual dis. conta. qt (based on runoff) (g):	6.97E+01	4.49E+01	9.29E+01	5.08E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.25E+01	2.67E+01	2.72E+01	2.32E+01
Single storm adsorbed contaminant quantity PXi (g):	1.15E+02	2.11E+02	2.36E+03	2.22E+02
Annual adsorbed contaminant quantity (g):	1.78E+03	6.96E+02	3.93E+04	5.73E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.10E-04	9.35E-04	9.99E-04	8.40E-04
Single storm dissolved contaminant quantity PQi (g):	8.73E-01	1.87E+01	1.27E+01	8.75E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.36E+01	6.16E+01	2.11E+02	2.26E+02
Annual dis. conta. qt (based on runoff) (g):	1.43E+01	3.10E+02	2.11E+02	1.50E+02

PADDYS RUN BASIN | CHEMICAL: 1,1,2,2-TETRACHLOROETHANE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:00

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	7.59E-04
Annual Conc. at Eff. Line	2.38E-04

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING 1,1,2,2-TETRACHLOROETHANE RISK CRITERIA : 9.00E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 1,1,2,2-TETRACHLOROET BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.88E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.28E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	7.52E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.40E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.48E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.87E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.45E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** 1,1,2-TRICHLOROETHANE | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:02

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	9.23E-06
Annual Conc. at Eff. Line	2.89E-06

Loading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub580	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | **1,1,2-TRICHLOROETHANE RISK CRITERIA :** 3.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 1,1,2-TRICHLOROETHANE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.19E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.32E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.09E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	8.97E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.79E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.91E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.98E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** 1,1-DICHLOROETHENE | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:04

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	4.84E-04	6.15E+00	4.49E+05	9.06E-01	4.38E-04
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	2.52E-04	6.15E+00	1.15E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	1.47E-01	6.70E-04
Max:	1.47E-01	6.70E-04

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	2.11E-02
Avg. Conc. in GMR	2.11E-03
Max. Conc. in Paddys Run at GMR	1.21E-01
Max. Conc. in GMR at Paddys Run	1.22E-02
Max. Conc. in GMR at Eff. Line (max week)	7.32E-04
Annual Conc. at Eff. Line	2.32E-04

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	9.23E-02	1.01E-04	1.04E-02
SSOD				56.6	3.48E+00	3.81E-03	2.07E-01
TOTAL					3.57E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	2.57E+00	3.13E-05	1.55E-05
SSOD	9.71E+01	1.18E-03	5.83E-04
TOTAL	9.97E+01	1.21E-03	5.99E-04

CPC SCREENING | **1,1-DICHLOROETHENE RISK CRITERIA :** 6.70E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	4.84E-04	NO	2.07E-01	NO
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 1,1-DICHLOROETHENE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.46E-03	2.20E-03	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.74E-02	1.92E-01	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	9.02E-02	3.19E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.24E-04	4.84E-04	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.45E+01	6.15E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.77E+01	1.02E+02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.40E+02	1.02E+02	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 1,2-DICHLOROETHANE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 10:06

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0,	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	3.80E-05
Annual Conc. at Eff. Line	1.21E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | 1,2-DICHLOROETHANE RISK CRITERIA : 2.00E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 1,2-DICHLOROETHANE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.68E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.33E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	4.37E-03	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.76E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	7.51E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.48E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.25E+01	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 1,2-DICHLOROETHENE (TOTAL) | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 10:07

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	1.56E-03
Annual Conc. at Eff. Line	4.97E-04

Loading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgmax per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING 1,2-DICHLOROETHENE (TOTAL) RISK CRITERIA : 3.70E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 1,2-DICHLOROETHENE (T BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	7.39E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.86E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.93E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.55E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.09E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.02E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.13E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 2-BUTANONE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:09

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.50E-05	1.68E-01	1.70E+05	2.00E-01	6.99E-06
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.57E-04	2.00E+00	4.49E+05	9.06E-01	1.43E-04
Sub582	4.30E-04	4.48E+00	3.68E+05	4.35E-01	1.87E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.50E-05	1.68E-01	1.04E-05
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	2.66E-04	6.48E+00	7.20E-05

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	6.99E-03	2.08E-06
D-D	6.99E-03	2.08E-06
E-E	1.58E-01	4.28E-05
Max:	1.58E-01	4.28E-05

Great Miami River (ug/l)

Avg. Conc. in Paddys Run at GMR	2.28E-02
Avg. Conc. in GMR	2.28E-03
Max. Conc. in Paddys Run at GMR	1.30E-01
Max. Conc. in GMR at Paddys Run	1.31E-02
Max. Conc. in GMR at Eff. Line (max week)	1.92E-03
Annual Conc. at Eff. Line	6.14E-04

Leading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub580	Mass leading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.47E-02	3.80E-05	2.83E-03
D-E	7.5	11.1	13.9		1.26E-02	1.38E-05	1.22E-03
E-F	0.7	1.6	1.1	1.5	9.84E-02	1.08E-04	1.11E-02
SSOD				56.6	3.67E+00	4.02E-03	2.18E-01
TOTAL					3.81E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.12E+00	6.24E-05	3.08E-05
D-E	1.87E+00	2.27E-05	1.12E-05
E-F	3.95E+00	4.81E-05	2.37E-05
SSOD	1.42E+02	1.73E-03	8.55E-04
TOTAL	1.53E+02	1.87E-03	9.21E-04

CPC SCREENING — 2-BUTANONE RISK CRITERIA : 2.19E+03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.50E-05	YES	2.71E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	1.57E-04	YES	1.57E-01	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	4.30E-04	YES	2.18E-01	YES

CHEMICAL: 2-BUTANONE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.04E-05	1.88E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	9.73E-05	7.94E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	4.21E-03	6.02E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.50E-05	6.62E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.68E-01	2.25E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	7.28E+00	1.71E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.75E+00	3.75E+02	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.23E-04	4.30E-05	1.16E-04
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.77E-03	3.73E-03	1.11E-03
Annual adsorbed contaminant quantity (g):	0.00E+00	5.82E-03	6.21E-02	2.86E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.78E-04	1.57E-04	4.30E-04
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.56E+01	2.00E+00	4.48E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.13E+01	3.33E+01	1.16E+02
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.58E+02	3.33E+01	7.67E+01

PADDYS RUN BASIN | CHEMICAL: 4-METHYL-2-PENTANONE | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 10:11

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.76E-03	8.45E+00	1.70E+05	2.00E-01	3.51E-04
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	1.76E-03	8.45E+00	3.55E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	3.51E-01	7.09E-04
D-D	3.51E-01	7.09E-04
E-E	3.51E-01	7.09E-04
Max.	3.51E-01	7.09E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	2.89E-02
Avg. Conc. in GMR	2.90E-03
Max. Conc. in Paddys Run at GMR	2.90E-01
Max. Conc. in GMR at Paddys Run	2.91E-02
Max. Conc. in GMR at Eff. Line (max week)	4.08E-03
Annual Conc. at Eff. Line	1.30E-03

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.74E+00	1.91E-03	1.42E-01
D-E	7.5	11.1	13.9		6.34E-01	6.95E-04	6.15E-02
E-F	0.7	1.6	1.1	1.5	5.92E-02	6.48E-05	6.68E-03
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					2.43E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.57E+02	3.13E-03	1.55E-03
D-E	9.37E+01	1.14E-03	5.63E-04
E-F	8.74E+00	1.06E-04	5.25E-05
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	3.60E+02	4.38E-03	2.16E-03

CPC SCREENING | 4-METHYL-2-PENTANONE RISK CRITERIA : 1.83E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.76E-03	YES	1.36E-01	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 4-METHYL-2-PENTANONE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.55E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.32E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.44E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.76E-03	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	8.45E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.66E+02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.38E+02	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	7.86E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	6.23E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.05E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.04E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	8.08E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.66E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.34E+03	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: ACETONE | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 5/23/94 10:13

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.29E-04	2.55E+00	1.70E+05	2.00E-01	1.06E-04
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	3.61E-03	1.26E+01	1.23E+05	2.62E-01	9.46E-04
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.41E-03	3.06E+01	4.49E+05	9.06E-01	2.18E-03
Sub582	5.14E-05	5.35E-01	3.68E+05	4.35E-01	2.24E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.29E-04	2.55E+00	4.95E-05
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	3.61E-03	1.26E+01	3.46E-04
Sub 580, 581 & 582	1.28E-03	3.12E+01	1.10E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.06E-01	9.91E-06
D-D	9.74E-01	9.33E-05
E-E	1.16E+00	1.04E-04
Max	1.16E+00	1.04E-04

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	1.58E-01
Avg. Conc. in GMR	1.59E-02
Max. Conc. in Paddys Run at GMR	9.57E-01
Max. Conc. in GMR at Paddys Run	9.61E-02
Max. Conc. in GMR at Eff. Line (max week)	1.17E-02
Annual Conc. at Eff. Line	3.73E-03

Loading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.25E-01	5.75E-04	4.28E-02
D-E	7.5	11.1	13.9		1.94E+00	2.12E-03	1.88E-01
E-F	0.7	1.6	1.1	1.5	6.24E-01	6.83E-04	7.04E-02
SSOD				56.6	1.76E+01	1.93E-02	1.05E+00
TOTAL					2.07E+01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 8 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.76E+01	9.44E-04	4.66E-04
D-E	2.13E+02	2.59E-03	1.28E-03
E-F	3.04E+01	3.71E-04	1.83E-04
SSOD	4.97E+02	6.05E-03	2.98E-03
TOTAL	8.18E+02	9.96E-03	4.91E-03

CPC SCREENING | ACETONE RISK CRITERIA : 3.65E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.29E-04	YES	1.92E-01	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	2.41E-03	YES	1.05E+00	YES
Sub575	3.61E-03	YES	1.92E-01	YES	Sub582	5.14E-05	YES	5.14E-02	YES

CHEMICAL: ACETONE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.95E-05	9.22E-04	0.00E+00	3.46E-04
Single storm adsorbed contaminant quantity PXi (g):	4.64E-04	3.88E-03	0.00E+00	7.67E-04
Annual adsorbed contaminant quantity (g):	2.01E-02	2.95E-02	0.00E+00	1.28E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.29E-04	1.03E-02	0.00E+00	3.61E-03
Single storm dissolved contaminant quantity PQi (g):	2.55E+00	3.50E+01	0.00E+00	1.26E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.10E+02	2.65E+02	0.00E+00	2.10E+02
Annual dis. conta. qt (based on runoff) (g):	4.16E+01	5.83E+02	0.00E+00	2.10E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	8.89E-04	2.07E-04	4.48E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	7.04E-03	1.80E-02	4.29E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	2.32E-02	3.00E-01	1.11E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.86E-03	2.41E-03	5.14E-05
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.97E+02	3.06E+01	5.35E-01
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	6.49E+02	5.09E+02	1.38E+01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.27E+03	5.09E+02	9.17E+00

PADDYS RUN BASIN | CHEMICAL: BENZENE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 5/23/94 10:15

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	8.94E-05	4.30E-01	1.70E+05	2.00E-01	1.79E-05
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	8.94E-05	4.30E-01	1.98E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.79E-02	3.96E-04
D-D	1.79E-02	3.96E-04
E-E	1.79E-02	3.96E-04
Max:	1.79E-02	3.96E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.47E-03
Avg. Conc. in GMR	1.48E-04
Max. Conc. in Paddys Run at GMR	1.48E-02
Max. Conc. in GMR at Paddys Run	1.48E-03
Max. Conc. in GMR at Eff. Line (max week)	2.05E-05
Annual Conc. at Eff. Line	6.48E-06

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			8.87E-02	9.71E-05	7.23E-03
D-E	7.5	11.1	13.9		3.23E-02	3.54E-05	3.13E-03
E-F	0.7	1.6	1.1	1.5	3.01E-03	3.30E-06	3.40E-04
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.24E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.31E+01	1.60E-04	7.87E-05
D-E	4.77E+00	5.81E-05	2.87E-05
E-F	4.45E-01	5.42E-06	2.67E-06
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.83E+01	2.23E-04	1.10E-04

CPC SCREENING

BENZENE RISK CRITERIA : 6.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	8.94E-05	NO	6.93E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: BENZENE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.98E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.86E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	8.03E-01	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	8.94E-05	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	4.30E-01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.86E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	7.03E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.30E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.41E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.12E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.01E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.03E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.33E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.68E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: BROMODICHLOROMETHANE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:17

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	2.65E-04	9.24E-01	1.23E+05	2.62E-01	6.95E-05
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	2.65E-04	9.24E-01	3.39E-03
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	6.96E-02	8.88E-04
E-E	6.96E-02	8.88E-04
Max:	6.96E-02	8.88E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	3.16E-03
Avg. Conc. in GMR	3.18E-04
Max. Conc. in Paddys Run at GMR	5.75E-02
Max. Conc. in GMR at Paddys Run	5.77E-03
Max. Conc. in GMR at Eff. Line (max week)	0.00E+00
Annual Conc. at Eff. Line	0.00E+00

Loading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		1.28E-01	1.41E-04	1.25E-02
E-F	0.7	1.6	1.1	1.5	1.02E-02	1.11E-05	1.15E-03
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.39E-01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	1.36E+01	1.65E-04	8.16E-05
E-F	1.08E+00	1.31E-05	6.46E-06
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.47E+01	1.79E-04	8.81E-05

CPC SCREENING — BROMODICHLOROMETHANE RISK CRITERIA : 1.40E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	2.65E-04	NO	1.11E-02	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: BROMODICHLOROMETH BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	3.39E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	7.51E-03
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	1.26E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	2.65E-04
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	9.24E-01
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	1.55E+01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	1.54E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** BROMOMETHANE | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 10:18

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	8.75E-03
Annual Conc. at Eff. Line	2.78E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | **BROMOMETHANE RISK CRITERIA :** 1.08E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: BROMOMETHANE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.72E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.37E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	4.50E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	8.66E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.73E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.70E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.87E+03	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: CARBON DISULFIDE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/23/94 10:20

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.92E-06	2.37E-02	1.70E+05	2.00E-01	9.84E-07
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4 34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4 49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.92E-06	2.37E-02	1.17E-04
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.84E-04	2.34E-05
D-D	9.84E-04	2.34E-05
E-E	9.84E-04	2.34E-05
Max:	9.84E-04	2.34E-05

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	8.11E-05
Avg. Conc. in GMR	8.14E-06
Max. Conc. in Paddys Run at GMR	8.13E-04
Max. Conc. in GMR at Paddys Run	8.16E-05
Max. Conc. in GMR at Eff. Line (max week)	1.86E-04
Annual Conc. at Eff. Line	5.89E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.88E-03	5.35E-06	3.98E-04
D-E	7.5	11.1	13.9		1.78E-03	1.95E-06	1.72E-04
E-F	0.7	1.6	1.1	1.5	1.66E-04	1.82E-07	1.87E-05
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					6.82E-03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.21E-01	8.78E-06	4.33E-06
D-E	2.63E-01	3.20E-06	1.58E-06
E-F	2.45E-02	2.98E-07	1.47E-07
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.01E+00	1.23E-05	6.05E-06

CPC SCREENING | CARBON DISULFIDE RISK CRITERIA : 2.80E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.92E-06	YES	3.81E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0 00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0 00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: CARBON DISULFIDE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.17E-04	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.10E-03	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	4.75E-02	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.92E-06	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.37E-02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.03E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.87E-01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.20E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.33E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.10E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.83E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.66E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.21E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.06E+01	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: CHLOROFORM | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: | Investigator DCW | Date 5/23/94 10:22

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	1.21E-03	4.22E+00	1.23E+05	2.62E-01	3.17E-04
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	1.21E-03	4.22E+00	1.90E-02
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	3.18E-01	4.98E-03
E-E	3.18E-01	4.98E-03
Max:	3.18E-01	4.98E-03

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.44E-02
Avg. Conc. in GMR	1.45E-03
Max. Conc. in Paddys Run at GMR	2.62E-01
Max. Conc. in GMR at Paddys Run	2.63E-02
Max. Conc. in GMR at Eff. Line (max week)	2.17E-04
Annual Conc. at Eff. Line	6.85E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		5.86E-01	6.42E-04	5.69E-02
E-F	0.7	1.6	1.1	1.5	4.64E-02	5.08E-05	5.24E-03
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					6.33E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	6.20E+01	7.55E-04	3.72E-04
E-F	4.91E+00	5.98E-05	2.95E-05
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.69E+01	8.15E-04	4.02E-04

CPC SCREENING | CHLOROFORM RISK CRITERIA : 2.80E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	1.21E-03	NO	5.07E-02	NO	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: CHLOROFORM BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	1.90E-02
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	4.21E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	7.04E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	1.21E-03
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	4.22E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	7.05E+01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	7.05E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.15E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.49E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	8.22E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.13E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.26E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.40E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	7.07E+01	0.00E+00	0.00E+00

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PADDYS RUN BASIN | **CHEMICAL:** METHYLENE CHLORIDE | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/23/94 10 24

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.58E-02	2.20E+02	1.70E+05	2.00E-01	9.15E-03
Sub570	2.12E-03	1.19E+01	1.99E+05	9.68E-01	2.05E-03
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.03E-03	1.31E+01	4.49E+05	9.06E-01	9.35E-04
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.58E-02	2.20E+02	1.32E-01
Sub570	2.12E-03	1.19E+01	6.60E-03
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	5.39E-04	1.31E+01	1.45E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.15E+00	2.64E-02
D-D	9.15E+00	2.64E-02
E-E	9.15E+00	2.64E-02
Max:	9.15E+00	2.64E-02

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	8.40E-01
Avg. Conc. in GMR	8.43E-02
Max. Conc. in Paddys Run at GMR	7.56E+00
Max. Conc. in GMR at Paddys Run	7.59E-01
Max. Conc. in GMR at Eff. Line (max week)	2.94E-03
Annual Conc. at Eff. Line	9.33E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.84E+01	5.30E-02	3.94E+00
D-E	7.5	11.1	13.9		1.78E+01	1.96E-02	1.73E+00
E-F	0.7	1.6	1.1	1.5	1.93E+00	2.11E-03	2.18E-01
SSOD				56.6	7.43E+00	8.14E-03	4.41E-01
TOTAL					7.56E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.84E+03	8.32E-02	4.10E-02
D-E	2.50E+03	3.04E-02	1.50E-02
E-F	2.43E+02	2.95E-03	1.46E-03
SSOD	2.07E+02	2.52E-03	1.24E-03
TOTAL	9.78E+03	1.19E-01	5.87E-02

CPC SCREENING | **METHYLENE CHLORIDE RISK CRITERIA :** 6.30E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.58E-02	NO	3.78E+00	NO	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	2.12E-03	NO	2.12E+00	NO	Sub581	1.03E-03	NO	4.41E-01	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: METHYLENE CHLORIDE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.32E-01	8.04E-04	6.60E-03	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.24E+00	3.38E-03	2.93E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	5.35E+01	2.57E-02	2.64E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.58E-02	2.87E-04	2.12E-03	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.20E+02	9.75E-01	1.19E+01	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	9.53E+03	7.40E+00	1.07E+02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.60E+03	1.63E+01	2.00E+02	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	8.04E-03	2.77E-03	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	6.37E-02	2.41E-01	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.10E-01	4.01E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.86E-03	1.03E-03	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	5.71E+01	1.31E+01	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.88E+02	2.18E+02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	9.47E+02	2.18E+02	0.00E+00

PADDYS RUN BASIN | CHEMICAL: STYRENE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:26

Subbasin	Cs Dissolved Conc. (mg/l)	PQs Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	3.51E-05
Annual Conc. at Eff. Line	1.07E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING — STYRENE RISK CRITERIA : 2.80E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: STYRENE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.64E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.67E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.21E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.29E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	6.57E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.17E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.09E+01	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: TETRACHLOROETHENE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 10:28

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.21E-05	2.99E-01	1.70E+05	2.00E-01	1.24E-05
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.28E-05	1.63E-01	4.49E+05	9.06E-01	1.16E-05
Sub582	5.42E-05	5.65E-01	3.68E+05	4.35E-01	2.36E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.21E-05	2.99E-01	3.46E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	2.99E-05	7.28E-01	1.51E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.24E-02	6.91E-04
D-D	1.24E-02	6.91E-04
E-E	2.27E-02	1.17E-03
Max:	2.27E-02	1.17E-03

Great Miami River (ug/l)

Avg. Conc. in Paddys Run at GMR	3.51E-03
Avg. Conc. in GMR	3.53E-04
Max. Conc. in Paddys Run at GMR	1.87E-02
Max. Conc. in GMR at Paddys Run	1.88E-03
Max. Conc. in GMR at Eff. Line (max week)	2.41E-03
Annual Conc. at Eff. Line	7.54E-04

Loading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.15E-02	6.74E-05	5.02E-03
D-E	7.5	11.1	13.9		2.24E-02	2.46E-05	2.17E-03
E-F	0.7	1.6	1.1	1.5	1.30E-02	1.43E-05	1.47E-03
SSOD				56.6	4.12E-01	4.51E-04	2.44E-02
TOTAL					5.09E-01		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	9.10E+00	1.11E-04	5.46E-05
D-E	3.31E+00	4.03E-05	1.99E-05
E-F	7.48E-01	9.11E-06	4.49E-06
SSOD	1.66E+01	2.02E-04	9.94E-05
TOTAL	2.97E+01	3.62E-04	1.78E-04

CPC SCREENING — TETRACHLOROETHENE RISK CRITERIA : 3.70E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.21E-05	YES	4.81E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	1.28E-05	YES	1.28E-02	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	5.42E-05	YES	2.44E-02	YES

CHEMICAL: TETRACHLOROETHENE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.46E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.23E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.40E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.21E-05	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.99E-01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.29E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.88E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.25E-01	6.54E-04	2.74E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	9.93E-01	5.69E-02	2.62E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	3.27E+00	9.46E-01	6.76E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.34E-03	1.28E-05	5.42E-05
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.67E+01	1.63E-01	5.65E-01
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.54E+02	2.70E+00	1.46E+01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	7.75E+02	2.70E+00	9.68E+00

PADDYS RUN BASIN | CHEMICAL: TRICHLOROETHENE | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 10:29

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.27E-05	2.54E-01	1.70E+05	2.00E-01	1.05E-05
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	3.59E-05	3.74E-01	3.68E+05	4.35E-01	1.56E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.27E-05	2.54E-01	2.94E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	1.54E-05	3.74E-01	7.75E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.05E-02	5.87E-04
D-D	1.05E-02	5.87E-04
E-E	1.34E-02	7.01E-04
Max:	1.34E-02	7.01E-04

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	2.15E-03
Avg. Conc. in GMR	2.16E-04
Max. Conc. in Paddys Run at GMR	1.11E-02
Max. Conc. in GMR at Paddys Run	1.11E-03
Max. Conc. in GMR at Eff. Line (max week)	5.22E-02
Annual Conc. at Eff. Line	1.63E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.23E-02	5.73E-05	4.26E-03
D-E	7.5	11.1	13.9		1.90E-02	2.09E-05	1.85E-03
E-F	0.7	1.6	1.1	1.5	7.39E-03	8.10E-06	8.35E-04
SSOD				56.6	2.12E-01	2.32E-04	1.26E-02
TOTAL					2.90E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 8 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.73E+00	9.41E-05	4.64E-05
D-E	2.81E+00	3.43E-05	1.69E-05
E-F	5.08E-01	6.19E-06	3.05E-06
SSOD	9.26E+00	1.13E-04	5.56E-05
TOTAL	2.03E+01	2.47E-04	1.22E-04

CPC SCREENING TRICHLOROETHENE RISK CRITERIA : 2.50E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.27E-05	YES	4.08E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	3.59E-05	YES	1.26E-02	YES

CHEMICAL: TRICHLOROETHENE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.94E-03	2.24E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.75E-02	9.43E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.19E+00	7.16E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.27E-05	4.20E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.54E-01	1.43E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.10E+01	1.08E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.14E+00	2.38E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.71E+00	0.00E+00	1.81E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.15E+01	0.00E+00	1.73E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	7.08E+01	0.00E+00	4.48E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.06E-02	0.00E+00	3.59E-05
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.01E+03	0.00E+00	3.74E-01
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.33E+03	0.00E+00	9.66E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.68E+04	0.00E+00	6.41E+00

PADDYS RUN BASIN | CHEMICAL: 2,4-DICHLOROPHENOL | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 10:43

Subbasin	Ce Dissolved Conc. (mg/l)	PQu Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	1.88E-04
Annual Conc. at Eff. Line	5.82E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING — 2,4-DICHLOROPHENOL RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 2,4-DICHLOROPHENOL BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.60E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.27E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	4.18E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.80E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.60E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.18E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.96E+01	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** 2,4-DINITROTOLUENE | **SCENARIO: WITH STORMWATER CONTROLS**

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 5/23/94 10:46

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	4.64E-04
Annual Conc. at Eff. Line	1.47E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | **2,4-DINITROTOLUENE RISK CRITERIA :** 1.30E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 2,4-DINITROTOLUENE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.86E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.44E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.79E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.56E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	9.13E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.01E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.51E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 2,6-DINITROTOLUENE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/18/94 14:44

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	1.07E-05
Annual Conc. at Eff. Line	3.36E-06
Max. Sed. Conc. in P.R. at GMR (mg/kg)	0.00E+00
Max. Sed. Conc. in GMR at P.R. (mg/kg)	0.00E+00

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | 2,6-DINITROTOLUENE RISK CRITERIA : 1.30E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 2,6-DINITROTOLUENE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.14E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.49E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	8.19E-03	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.04E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.09E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	6.88E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.46E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 2-CHLOROPHENOL | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 6/18/94 14:45

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.11E-04	1.50E+00	1.70E+05	2.00E-01	6.22E-05
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	3.11E-04	1.50E+00	7.11E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	6.22E-02	1.42E-03
D-D	6.22E-02	1.42E-03
E-E	6.22E-02	1.42E-03
Max:	6.22E-02	1.42E-03

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	5.13E-03
Avg. Conc. in GMR	5.15E-04
Max. Conc. in Paddys Run at GMR	5.14E-02
Max. Conc. in GMR at Paddys Run	5.16E-03
Max. Conc. in GMR at Eff. Line (max week)	0.00E+00
Annual Conc. at Eff. Line	0.00E+00
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.17E-03
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.18E-04

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.09E-01	3.38E-04	2.52E-02
D-E	7.5	11.1	13.9		1.12E-01	1.23E-04	1.09E-02
E-F	0.7	1.6	1.1	1.5	1.05E-02	1.15E-05	1.18E-03
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					4.31E-01		

Total Mass Leading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.56E+01	5.55E-04	2.74E-04
D-E	1.66E+01	2.02E-04	9.97E-05
E-F	1.55E+00	1.89E-05	9.31E-06
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.38E+01	7.77E-04	3.83E-04

CPC SCREENING | 2-CHLOROPHENOL RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.11E-04	YES	2.41E-02	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 2-CHLOROPHENOL Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.11E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.66E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	2.88E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.11E-04	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.50E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	6.49E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.45E+01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 3,3'-DICHLOROBENZIDINE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/16/94 14:45

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.35E-05	3.06E-01	1.70E+05	2.00E-01	1.27E-05
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.35E-05	3.06E-01	3.33E-02
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.27E-02	6.66E-03
D-D	1.27E-02	6.66E-03
E-E	1.27E-02	6.66E-03
Max:	1.27E-02	6.66E-03

Great Miami River

	ug/l
Avg. Conc. in Paddys Run at GMR	1.05E-03
Avg. Conc. in GMR	1.05E-04
Max. Conc. in Paddys Run at GMR	1.05E-02
Max. Conc. in GMR at Paddys Run	1.05E-03
Max. Conc. in GMR at Eff. Line (max week)	0.00E+00
Annual Conc. at Eff. Line	0.00E+00
Max. Sed. Conc. in P.R. at GMR (mg/kg)	5.50E-03
Max. Sed. Conc. in GMR at P.R. (mg/kg)	5.52E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.29E-02	6.90E-05	5.13E-03
D-E	7.5	11.1	13.9		2.29E-02	2.51E-05	2.22E-03
E-F	0.7	1.6	1.1	1.5	2.14E-03	2.34E-06	2.42E-04
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					8.80E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	9.30E+00	1.13E-04	5.59E-05
D-E	3.39E+00	4.12E-05	2.03E-05
E-F	3.16E-01	3.85E-06	1.90E-06
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.30E+01	1.58E-04	7.81E-05

CPC SCREENING | 3,3'-DICHLOROBENZIDINE RISK CRITERIA : 1.90E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.35E-05	NO	4.92E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 3,3'-DICHLOROBENZIDIN Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.33E-02	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.12E-01	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.35E+01	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.35E-05	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.06E-01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.32E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.99E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 4-METHYLPHENOL | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS: | Investigator DCW | Date 6/18/94 14 47

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.41E-05	2.12E-01	1.70E+05	2.00E-01	8.83E-06
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	8.13E-03	2.83E+01	1.23E+05	2.62E-01	2.13E-03
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	1.04E-01	1.08E+03	3.68E+05	4.35E-01	4.51E-02

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	4.41E-05	2.12E-01	5.76E-04
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	8.13E-03	2.83E+01	1.08E-01
Sub 580, 581 & 582	4.43E-02	1.08E+03	5.24E-01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	8.83E-03	1.15E-04
D-D	2.13E+00	2.85E-02
E-E	2.67E+01	3.17E-01
Max:	2.67E+01	3.17E-01

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	3.80E+00
Avg. Conc. in GMR	3.81E-01
Max. Conc. in Paddys Run at GMR	2.21E+01
Max. Conc. in GMR at Paddys Run	2.21E+00
Max. Conc. in GMR at Eff. Line (max week)	5.00E-04
Annual Conc. at Eff. Line	1.56E-04
Max. Sed. Conc. in P.R. at GMR (mg/kg)	2.62E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	2.63E-02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.38E-02	4.80E-05	3.57E-03
D-E	7.5	11.1	13.9		3.95E+00	4.33E-03	3.83E-01
E-F	0.7	1.6	1.1	1.5	1.65E+01	1.81E-02	1.87E+00
SSOD				56.6	6.11E+02	6.70E-01	3.63E+01
TOTAL					6.32E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.47E+00	7.88E-05	3.89E-05
D-E	4.19E+02	5.10E-03	2.51E-03
E-F	7.42E+02	9.03E-03	4.45E-03
SSOD	2.67E+04	3.26E-01	1.61E-01
TOTAL	2.79E+04	3.40E-01	1.68E-01

CPC SCREENING | 4-METHYLPHENOL RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.41E-05	YES	4.41E-02	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	8.13E-03	YES	3.44E-01	YES	Sub582	1.04E-01	NO	3.63E+01	NO

CHEMICAL: 4-METHYLPHENOL Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.76E-04	0.00E+00	0.00E+00	1.08E-01
Single storm adsorbed contaminant quantity PXi (g):	5.39E-03	0.00E+00	0.00E+00	2.41E-01
Annual adsorbed contaminant quantity (g):	2.33E-01	0.00E+00	0.00E+00	4.02E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.41E-05	0.00E+00	0.00E+00	8.13E-03
Single storm dissolved contaminant quantity PQi (g):	2.12E-01	0.00E+00	0.00E+00	2.83E+01
Annual dis. conta. qt (based on sediment yield)(g):	9.20E+00	0.00E+00	0.00E+00	4.73E+02
Annual dis. conta. qt (based on runoff) (g):	3.47E+00	0.00E+00	0.00E+00	4.73E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.19E-03	0.00E+00	1.23E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.91E-02	0.00E+00	1.17E+01
Annual adsorbed contaminant quantity (g):	0.00E+00	1.62E-01	0.00E+00	3.03E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.93E-04	0.00E+00	1.04E-01
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	9.86E+00	0.00E+00	1.08E+03
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.25E+01	0.00E+00	2.79E+04
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.63E+02	0.00E+00	1.85E+04

PADDYS RUN BASIN | **CHEMICAL:** 4-NITROANILINE | **SCENARIO: WITH STORMWATER CONTROLS**

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 6/18/94 14:48

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.97E-03	3.35E+01	1.70E+05	2.00E-01	1.39E-03
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.97E-03	3.35E+01	2.77E-02
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.39E+00	5.53E-03
D-D	1.39E+00	5.53E-03
E-E	1.39E+00	5.53E-03
Max:	1.39E+00	5.53E-03

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	1.15E-01
Avg. Conc. in GMR	1.15E-02
Max. Conc. in Paddys Run at GMR	1.15E+00
Max. Conc. in GMR at Paddys Run	1.16E-01
Max. Conc. in GMR at Eff. Line (max week)	0.00E+00
Annual Conc. at Eff. Line	0.00E+00
Max. Sed. Conc. in P.R. at GMR (mg/kg)	4.57E-03
Max. Sed. Conc. in GMR at P.R. (mg/kg)	4.59E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.91E+00	7.57E-03	5.63E-01
D-E	7.5	11.1	13.9		2.52E+00	2.76E-03	2.44E-01
E-F	0.7	1.6	1.1	1.5	2.35E-01	2.57E-04	2.65E-02
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					9.66E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.02E+03	1.24E-02	6.13E-03
D-E	3.72E+02	4.53E-03	2.23E-03
E-F	3.47E+01	4.23E-04	2.08E-04
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.43E+03	1.74E-02	8.58E-03

CPC SCREENING — 4-NITROANILINE RISK CRITERIA : 1.10E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.97E-03	NO	5.40E-01	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: 4-NITROANILINE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.77E-02	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.59E-01	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.12E+01	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.97E-03	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.35E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.45E+03	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	5.48E+02	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: BENZO(A)ANTHRACENE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 6/18/94 14:49

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.62E-05	1.26E-01	1.70E+05	2.00E-01	5.23E-06
Sub570	2.50E-06	1.41E-02	1.99E+05	9.68E-01	2.42E-06
Sub575	7.64E-07	2.66E-03	1.23E+05	2.62E-01	2.00E-07
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.12E-06	2.70E-02	4.49E+05	9.06E-01	1.92E-06
Sub582	1.84E-08	1.92E-04	3.68E+05	4.35E-01	8.02E-09

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.62E-05	1.26E-01	1.70E+00
Sub570	2.50E-06	1.41E-02	1.73E-01
sub575	7.64E-07	2.66E-03	5.14E-02
Sub 580, 581 & 582	1.12E-06	2.72E-02	6.73E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Leading to the Great Miami Aquifer

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.23E-03	3.39E-01
D-D	5.23E-03	3.39E-01
E-E	5.23E-03	3.39E-01
Max:	5.23E-03	3.39E-01

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.95E-02	3.23E-05	2.41E-03
D-E	7.5	11.1	13.9		1.14E-02	1.25E-05	1.10E-03
E-F	0.7	1.6	1.1	1.5	1.54E-03	1.69E-06	1.74E-04
SSOD				56.6	1.54E-02	1.69E-05	9.13E-04
TOTAL					5.78E-02		

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	5.82E-04
Avg. Conc. in GMR	5.84E-05
Max. Conc. in Paddys Run at GMR	4.32E-03
Max. Conc. in GMR at Paddys Run	4.34E-04
Max. Conc. in GMR at Eff. Line (max week)	5.41E-04
Annual Conc. at Eff. Line	4.01E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	2.80E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	2.81E-02

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.99E+00	4.85E-05	2.39E-05
D-E	1.50E+00	1.83E-05	9.02E-06
E-F	1.56E-01	1.90E-06	9.35E-07
SSOD	4.31E-01	5.25E-06	2.59E-06
TOTAL	6.08E+00	7.40E-05	3.65E-05

CPC SCREENING — BENZO(A)ANTHRACENE RISK CRITERIA : 7.70E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.62E-05	NO	2.34E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	2.50E-06	YES	2.34E-03	YES	Sub581	2.12E-06	YES	9.13E-04	YES
Sub575	7.64E-07	YES	7.64E-04	YES	Sub582	1.84E-08	YES	1.84E-05	YES

CHEMICAL: BENZO(A)ANTHRACENE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.70E+00	3.99E-02	1.73E-01	5.14E-02
Single storm adsorbed contaminant quantity PXi (g):	1.59E+01	1.68E-01	7.70E-01	1.14E-01
Annual adsorbed contaminant quantity (g):	6.88E+02	1.27E+00	6.92E+00	1.91E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.62E-05	6.34E-07	2.50E-06	7.64E-07
Single storm dissolved contaminant quantity PQi (g):	1.26E-01	2.15E-03	1.41E-02	2.66E-03
Annual dis. conta. qt (based on sediment yield)(g):	5.45E+00	1.63E-02	1.27E-01	4.45E-02
Annual dis. conta. qt (based on runoff) (g):	2.06E+00	3.59E-02	2.36E-01	4.45E-02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.28E+00	1.28E-01	1.13E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.01E+01	1.11E+01	1.08E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	3.34E+01	1.85E+02	2.79E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.02E-05	2.12E-06	1.84E-08
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.05E-01	2.70E-02	1.92E-04
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.33E+00	4.49E-01	4.96E-03
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.71E+00	4.49E-01	3.29E-03

PADDYS RUN BASIN | CHEMICAL: BENZO(A)PYRENE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 6/18/94 14:50

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.38E-05	6.66E-02	1.70E+05	2.00E-01	2.77E-06
Sub570	8.54E-07	4.81E-03	1.99E+05	9.68E-01	8.27E-07
Sub575	2.91E-07	1.01E-03	1.23E+05	2.62E-01	7.63E-08
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.42E-06	1.80E-02	4.49E+05	9.06E-01	1.28E-06
Sub582	8.43E-09	8.78E-05	3.68E+05	4.35E-01	3.67E-09

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.38E-05	6.66E-02	2.14E+00
Sub570	8.54E-07	4.81E-03	1.41E-01
sub575	2.91E-07	1.01E-03	4.68E-02
Sub 580, 581 & 582	7.43E-07	1.81E-02	1.07E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.77E-03	4.28E-01
D-D	2.77E-03	4.28E-01
E-E	2.77E-03	4.28E-01
Max:	2.77E-03	4.28E-01

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	3.10E-04
Avg. Conc. in GMR	3.11E-05
Max. Conc. in Paddys Run at GMR	2.28E-03
Max. Conc. in GMR at Paddys Run	2.29E-04
Max. Conc. in GMR at Eff. Line (max week)	6.18E-04
Annual Conc. at Eff. Line	4.22E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.53E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.55E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.49E-02	1.64E-05	1.22E-03
D-E	7.5	11.1	13.9		5.67E-03	6.21E-06	5.50E-04
E-F	0.7	1.6	1.1	1.5	8.25E-04	9.05E-07	9.32E-05
SSOD				56.6	1.02E-02	1.12E-05	6.08E-04
TOTAL					3.17E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.08E+00	2.53E-05	1.25E-05
D-E	7.76E-01	9.44E-06	4.66E-06
E-F	8.14E-02	9.91E-07	4.89E-07
SSOD	2.87E-01	3.49E-06	1.72E-06
TOTAL	3.22E+00	3.92E-05	1.93E-05

CPC SCREENING — BENZO(A)PYRENE RISK CRITERIA : 1.20E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.38E-05	NO	1.18E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	8.54E-07	YES	8.54E-04	YES	Sub581	1.42E-06	NO	6.08E-04	YES
Sub575	2.91E-07	YES	2.91E-04	YES	Sub582	8.43E-09	YES	8.43E-06	YES

CHEMICAL: BENZO(A)PYRENE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.14E+00	4.43E-02	1.41E-01	4.68E-02
Single storm adsorbed contaminant quantity PXi (g):	2.00E+01	1.87E-01	6.27E-01	1.04E-01
Annual adsorbed contaminant quantity (g):	8.67E+02	1.42E+00	5.63E+00	1.73E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.38E-05	2.95E-07	8.54E-07	2.91E-07
Single storm dissolved contaminant quantity PQi (g):	6.66E-02	1.00E-03	4.81E-03	1.01E-03
Annual dis. conta. qt (based on sediment yield)(g):	2.88E+00	7.61E-03	4.32E-02	1.70E-02
Annual dis. conta. qt (based on runoff) (g):	1.09E+00	1.67E-02	8.07E-02	1.70E-02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.49E+00	2.04E-01	1.23E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.18E+01	1.77E+01	1.18E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	3.89E+01	2.95E+02	3.04E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.87E-06	1.42E-06	8.43E-09
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.97E-01	1.80E-02	8.78E-05
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	6.50E-01	2.99E-01	2.27E-03
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.27E+00	2.99E-01	1.50E-03

PADDYS RUN BASIN | CHEMICAL: BENZO(B)FLUORANTHENE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/18/94 14:51

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.63E-06	2.23E-02	1.70E+05	2.00E-01	9.25E-07
Sub570	2.89E-07	1.63E-03	1.99E+05	9.68E-01	2.80E-07
Sub575	8.09E-08	2.82E-04	1.23E+05	2.62E-01	2.12E-08
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	6.96E-07	8.85E-03	4.49E+05	9.06E-01	6.31E-07
Sub582	3.25E-09	3.38E-05	3.68E+05	4.35E-01	1.41E-09

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.63E-06	2.23E-02	2.78E+00
Sub570	2.89E-07	1.63E-03	1.86E-01
sub575	8.09E-08	2.82E-04	5.06E-02
Sub 580, 581 & 582	3.65E-07	8.89E-03	2.05E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.25E-04	5.58E-01
D-D	9.25E-04	5.58E-01
E-E	9.25E-04	5.58E-01
Max:	9.25E-04	5.58E-01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.13E-04
Avg. Conc. in GMR	1.14E-05
Max. Conc. in Paddys Run at GMR	7.64E-04
Max. Conc. in GMR at Paddys Run	7.67E-05
Max. Conc. in GMR at Eff. Line (max week)	4.32E-04
Annual Conc. at Eff. Line	2.91E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	4.61E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	4.63E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.00E-03	5.48E-06	4.07E-04
D-E	7.5	11.1	13.9		1.89E-03	2.07E-06	1.83E-04
E-F	0.7	1.6	1.1	1.5	3.18E-04	3.49E-07	3.60E-05
SSOD				56.6	5.03E-03	5.51E-06	2.99E-04
TOTAL					1.22E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.96E-01	8.47E-06	4.18E-06
D-E	2.59E-01	3.15E-06	1.55E-06
E-F	2.84E-02	3.45E-07	1.70E-07
SSOD	1.41E-01	1.71E-06	8.45E-07
TOTAL	1.12E+00	1.37E-05	6.75E-06

CPC SCREENING BENZO(B)FLUORANTHENE RISK CRITERIA : 9.50E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.63E-06	YES	3.94E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	2.89E-07	YES	2.89E-04	YES	Sub581	6.96E-07	YES	2.99E-04	YES
Sub575	8.09E-08	YES	8.09E-05	YES	Sub582	3.25E-09	YES	3.25E-06	YES

CHEMICAL: BENZO(B)FLUORANTHEN Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.79E+00	7.65E-02	1.86E-01	5.06E-02
Single storm adsorbed contaminant quantity PXi (g):	2.61E+01	3.22E-01	8.28E-01	1.12E-01
Annual adsorbed contaminant quantity (g):	1.13E+03	2.45E+00	7.44E+00	1.88E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.63E-06	1.31E-07	2.89E-07	8.09E-08
Single storm dissolved contaminant quantity PQi (g):	2.23E-02	4.45E-04	1.63E-03	2.82E-04
Annual dis. conta. qt (based on sediment yield)(g):	9.64E-01	3.37E-03	1.46E-02	4.71E-03
Annual dis. conta. qt (based on runoff) (g):	3.64E-01	7.41E-03	2.73E-02	4.71E-03

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.04E+00	3.91E-01	1.85E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	8.20E+00	3.40E+01	1.77E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	2.70E+01	5.65E+02	4.57E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.76E-06	6.96E-07	3.25E-09
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.52E-02	8.85E-03	3.38E-05
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.16E-01	1.47E-01	8.74E-04
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.83E-01	1.47E-01	5.79E-04

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PADDYS RUN BASIN | CHEMICAL: BENZO(K)FLUORANTHENE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/18/94 14:52

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.93E-06	9.31E-03	1.70E+05	2.00E-01	3.87E-07
Sub570	1.51E-07	8.50E-04	1.99E+05	9.68E-01	1.46E-07
Sub575	5.07E-08	1.77E-04	1.23E+05	2.62E-01	1.33E-08
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.70E-07	3.44E-03	4.49E+05	9.06E-01	2.45E-07
Sub582	7.08E-10	7.37E-06	3.68E+05	4.35E-01	3.08E-10

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.93E-06	9.31E-03	2.17E+00
Sub570	1.51E-07	8.50E-04	1.80E-01
sub575	5.07E-08	1.77E-04	5.90E-02
Sub 580, 581 & 582	1.41E-07	3.44E-03	1.48E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.87E-04	4.34E-01
D-D	3.87E-04	4.34E-01
E-E	3.87E-04	4.34E-01
Max:	3.87E-04	4.34E-01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	4.72E-05
Avg. Conc. in GMR	4.74E-06
Max. Conc. in Paddys Run at GMR	3.20E-04
Max. Conc. in GMR at Paddys Run	3.21E-05
Max. Conc. in GMR at Eff. Line (max week)	5.91E-04
Annual Conc. at Eff. Line	3.77E-05
Max. Sed. Conc. in P.R. @ GMR (mg/kg)	3.58E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.60E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.13E-03	2.34E-06	1.74E-04
D-E	7.5	11.1	13.9		8.17E-04	8.96E-07	7.93E-05
E-F	0.7	1.6	1.1	1.5	1.32E-04	1.45E-07	1.50E-05
SSOD				56.6	1.95E-03	2.14E-06	1.16E-04
TOTAL					5.03E-03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.93E-01	3.56E-06	1.76E-06
D-E	1.10E-01	1.34E-06	6.60E-07
E-F	1.19E-02	1.45E-07	7.17E-08
SSOD	5.45E-02	6.63E-07	3.27E-07
TOTAL	4.69E-01	5.71E-06	2.82E-06

CPC SCREENING | BENZO(K)FLUORANTHENE RISK CRITERIA : 2.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.93E-06	YES	1.69E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	1.51E-07	YES	1.51E-04	YES	Sub581	2.70E-07	YES	1.16E-04	YES
Sub575	5.07E-08	YES	5.07E-05	YES	Sub582	7.08E-10	YES	7.08E-07	YES

CHEMICAL: BENZO(K)FLUORANTHEN Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.17E+00	0.00E+00	1.80E-01	5.90E-02
Single storm adsorbed contaminant quantity PXi (g):	2.03E+01	0.00E+00	8.02E-01	1.31E-01
Annual adsorbed contaminant quantity (g):	8.79E+02	0.00E+00	7.20E+00	2.19E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.93E-06	0.00E+00	1.51E-07	5.07E-08
Single storm dissolved contaminant quantity PQi (g):	9.31E-03	0.00E+00	8.50E-04	1.77E-04
Annual dis. conta. qt (based on sediment yield)(g):	4.03E-01	0.00E+00	7.63E-03	2.96E-03
Annual dis. conta. qt (based on runoff) (g):	1.52E-01	0.00E+00	1.42E-02	2.95E-03

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.47E+00	2.82E-01	7.49E-04
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.17E+01	2.45E+01	7.17E-03
Annual adsorbed contaminant quantity (g):	0.00E+00	3.85E+01	4.08E+02	1.85E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.35E-06	2.70E-07	7.08E-10
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.69E-02	3.44E-03	7.37E-06
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	8.86E-02	5.72E-02	1.90E-04
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	4.46E-01	5.72E-02	1.26E-04

PADDYS RUN BASIN | CHEMICAL: BENZYL ALCOHOL | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 6/18/94 14:53

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.89E-03	9.12E+00	1.70E+05	2.00E-01	3.79E-04
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.89E-03	9.12E+00	3.86E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.79E-01	7.73E-04
D-D	3.79E-01	7.73E-04
E-E	3.79E-01	7.73E-04
Max:	3.79E-01	7.73E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	3.12E-02
Avg. Conc. in GMR	3.13E-03
Max. Conc. in Paddys Run at GMR	3.13E-01
Max. Conc. in GMR at Paddys Run	3.14E-02
Max. Conc. in GMR at Eff. Line (max week)	7.60E-03
Annual Conc. at Eff. Line	2.42E-03
Max. Sed. Conc. in P.R. at GMR (mg/kg)	6.38E-04
Max. Sed. Conc. in GMR at P.R. (mg/kg)	6.41E-05

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sub80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.88E+00	2.06E-03	1.53E-01
D-E	7.5	11.1	13.9		6.84E-01	7.49E-04	6.64E-02
E-F	0.7	1.6	1.1	1.5	6.38E-02	6.99E-05	7.21E-03
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					2.63E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.78E+02	3.38E-03	1.67E-03
D-E	1.01E+02	1.23E-03	6.07E-04
E-F	9.44E+00	1.15E-04	5.66E-05
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	3.88E+02	4.73E-03	2.33E-03

CPC SCREENING | BENZYL ALCOHOL RISK CRITERIA : 1.10E+03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.89E-03	YES	1.47E-01	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: BENZYL ALCOHOL Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.86E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.62E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.57E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.89E-03	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	9.12E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.95E+02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.49E+02	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.50E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.19E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.91E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.53E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.50E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.96E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.49E+03	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: BIS(2-CHLOROISOPROPYL) ETHER | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 6/18/94 14:54

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	7.89E-04	4.45E+00	1.99E+05	9.68E-01	7.64E-04
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	7.89E-04	4.45E+00	1.78E-02
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Leading to the Great Miami Aquifer

Paddys Run — Total Mass Leading Per Storm Event (2 days)

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)	Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
			C-D	20.6	25.2			1.12E+00	1.23E-03	9.14E-02
C-C	7.64E-01	1.70E-02	D-E	7.5	11.1	13.9		4.94E-01	5.41E-04	4.79E-02
D-D	7.64E-01	1.70E-02	E-F	0.7	1.6	1.1	1.5	7.12E-02	7.80E-05	8.04E-03
E-E	7.64E-01	1.70E-02	SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
Max:	7.64E-01	1.70E-02	TOTAL					1.69E+00		

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.52E-02
Avg. Conc. in GMR	1.53E-03
Max. Conc. in Paddys Run at GMR	6.31E-01
Max. Conc. in GMR at Paddys Run	6.33E-02
Max. Conc. in GMR at Eff. Line (max week)	3.36E-04
Annual Conc. at Eff. Line	1.06E-04
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.41E-02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.41E-03

Total Mass Leading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.77E+01	5.81E-04	2.87E-04
D-E	2.10E+01	2.56E-04	1.26E-04
E-F	3.44E+00	4.19E-05	2.06E-05
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	7.22E+01	8.79E-04	4.33E-04

CPC SCREENING — BIS(2-CHLOROISOPROPYL) ETHER RISK CRITERIA : 4.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	7.89E-04	NO	8.75E-02	NO	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: BIS(2-CHLOROISOPROPY Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	1.76E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	7.81E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	7.02E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	7.89E-04	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	4.45E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	3.99E+01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	7.45E+01	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.58E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.22E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.72E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.30E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	6.60E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.18E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.10E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: BIS(2-ETHYLHEXYL)PHTHALATE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/18/94 14:55

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.50E-04	7.21E-01	1.70E+05	2.00E-01	2.99E-05
Sub570	1.51E-05	8.51E-02	1.99E+05	9.68E-01	1.46E-05
Sub575	1.60E-05	5.57E-02	1.23E+05	2.62E-01	4.19E-06
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.78E-06	2.27E-02	4.49E+05	9.06E-01	1.62E-06
Sub582	1.74E-06	1.81E-02	3.68E+05	4.35E-01	7.56E-07

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.50E-04	7.21E-01	4.88E+00
Sub570	1.51E-05	8.51E-02	5.27E-01
sub575	1.60E-05	5.57E-02	5.37E-01
Sub 580, 581 & 582	1.67E-06	4.08E-02	5.01E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.99E-02	9.76E-01
D-D	2.99E-02	9.76E-01
E-E	2.99E-02	9.76E-01
Max:	2.99E-02	9.76E-01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	3.09E-03
Avg. Conc. in GMR	3.10E-04
Max. Conc. in Paddys Run at GMR	2.47E-02
Max. Conc. in GMR at Paddys Run	2.48E-03
Max. Conc. in GMR at Eff. Line (max week)	6.92E-04
Annual Conc. at Eff. Line	6.39E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	8.06E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	8.09E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.70E-01	1.86E-04	1.38E-02
D-E	7.5	11.1	13.9		7.12E-02	7.81E-05	6.91E-03
E-F	0.7	1.6	1.1	1.5	7.63E-03	8.36E-06	8.62E-04
SSOD				56.6	2.31E-02	2.53E-05	1.37E-03
TOTAL					2.72E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.29E+01	2.78E-04	1.37E-04
D-E	9.21E+00	1.12E-04	5.53E-05
E-F	8.98E-01	1.09E-05	5.39E-06
SSOD	8.07E-01	9.82E-06	4.84E-06
TOTAL	3.38E+01	4.11E-04	2.03E-04

CPC SCREENING BIS(2-ETHYLHEXYL)PHTHALATE RISK CRITERIA : 6.10E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.50E-04	YES	1.39E-02	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	1.51E-05	YES	1.39E-02	YES	Sub581	1.78E-06	YES	1.37E-03	YES
Sub575	1.60E-05	YES	1.39E-02	YES	Sub582	1.74E-06	YES	1.37E-03	YES

CHEMICAL: BIS(2-ETHYLHEXYL)PHTH Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.88E+00	4.79E-01	5.27E-01	5.37E-01
Single storm adsorbed contaminant quantity PXi (g):	4.57E+01	2.02E+00	2.34E+00	1.19E+00
Annual adsorbed contaminant quantity (g):	1.98E+03	1.53E+01	2.10E+01	1.99E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.50E-04	1.53E-05	1.51E-05	1.60E-05
Single storm dissolved contaminant quantity PQi (g):	7.21E-01	5.19E-02	8.51E-02	5.57E-02
Annual dis. conta. qt (based on sediment yield)(g):	3.12E+01	3.94E-01	7.64E-01	9.32E-01
Annual dis. conta. qt (based on runoff) (g):	1.18E+01	8.66E-01	1.43E+00	9.32E-01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.36E+00	5.37E-02	5.17E-02
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.08E+01	4.67E+00	4.94E-01
Annual adsorbed contaminant quantity (g):	0.00E+00	3.55E+01	7.76E+01	1.28E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.31E-05	1.78E-06	1.74E-06
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	8.61E-01	2.27E-02	1.81E-02
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.84E+00	3.77E-01	4.68E-01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.43E+01	3.77E-01	3.10E-01

PADDYS RUN BASIN | CHEMICAL: CARBAZOLE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 12:53

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	2.59E-05	1.46E-01	1.99E+05	9.68E-01	2.51E-05
Sub575	1.61E-05	5.62E-02	1.23E+05	2.62E-01	4.23E-06
Sub580	1.97E-05	2.42E-02	4.34E+04	1.28E-01	2.52E-06
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	2.59E-05	1.46E-01	8.70E-03
sub575	1.61E-05	5.62E-02	5.29E-03
Sub 580, 581 & 582	9.95E-07	2.42E-02	3.48E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	2.51E-02	8.42E-03
D-D	2.51E-02	8.42E-03
E-E	2.51E-02	8.42E-03
Max:	2.51E-02	8.42E-03

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	7.75E-04
Avg. Conc. in GMR	7.78E-05
Max. Conc. in Paddys Run at GMR	2.07E-02
Max. Conc. in GMR at Paddys Run	2.08E-03
Max. Conc. in GMR at Eff. Line (max week)	4.92E-04
Annual Conc. at Eff. Line	1.42E-04

Leading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.68E-02	4.03E-05	3.00E-03
D-E	7.5	11.1	13.9		2.40E-02	2.63E-05	2.33E-03
E-F	0.7	1.6	1.1	1.5	3.32E-03	3.64E-06	3.75E-04
SSOD				56.6	1.37E-02	1.50E-05	8.14E-04
TOTAL					7.78E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.57E+00	1.91E-05	9.41E-06
D-E	1.52E+00	1.85E-05	9.11E-06
E-F	1.88E-01	2.29E-06	1.13E-06
SSOD	3.78E-01	4.60E-06	2.27E-06
TOTAL	3.65E+00	4.44E-05	2.19E-05

CPC SCREENING — CARBAZOLE RISK CRITERIA : 4.30E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	1.97E-05	YES	8.14E-04	YES
Sub570	2.59E-05	YES	3.55E-03	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	1.61E-05	YES	3.55E-03	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: CARBAZOLE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.02E-02	8.70E-03	5.29E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.27E-01	3.86E-02	1.17E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	9.65E-01	3.47E-01	1.96E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.85E-05	2.59E-05	1.61E-05
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.35E-01	1.46E-01	5.62E-02
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.54E+00	1.31E+00	9.40E-01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.58E+00	2.45E+00	9.40E-01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.91E-03	1.28E-01	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.52E-02	1.01E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	5.48E-01	3.33E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.97E-05	4.14E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.42E-02	8.27E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.77E-01	2.73E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.98E-01	1.37E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** CHRYSENE | **SCENARIO: WITH STORMWATER CONTROLS**

Baseline

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 6/18/94 14:56

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.45E-05	1.66E-01	1.70E+05	2.00E-01	6.91E-06
Sub570	2.96E-06	1.67E-02	1.99E+05	9.68E-01	2.86E-06
Sub575	1.00E-06	3.49E-03	1.23E+05	2.62E-01	2.63E-07
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.12E-06	2.70E-02	4.49E+05	9.06E-01	1.92E-06
Sub582	2.51E-08	2.62E-04	3.68E+05	4.35E-01	1.09E-08

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.45E-05	1.66E-01	2.24E+00
Sub570	2.96E-06	1.67E-02	2.05E-01
sub575	1.00E-06	3.49E-03	6.75E-02
Sub 580, 581 & 582	1.12E-06	2.72E-02	6.75E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	6.91E-03	4.48E-01
D-D	6.91E-03	4.48E-01
E-E	6.91E-03	4.48E-01
Max:	6.91E-03	4.48E-01

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	7.31E-04
Avg. Conc. in GMR	7.34E-05
Max. Conc. in Paddys Run at GMR	5.70E-03
Max. Conc. in GMR at Paddys Run	5.72E-04
Max. Conc. in GMR at Eff. Line (max week)	4.69E-04
Annual Conc. at Eff. Line	3.49E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	3.70E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	3.71E-02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.84E-02	4.21E-05	3.13E-03
D-E	7.5	11.1	13.9		1.48E-02	1.62E-05	1.44E-03
E-F	0.7	1.6	1.1	1.5	1.88E-03	2.06E-06	2.12E-04
SSOD				56.6	1.54E-02	1.69E-05	9.15E-04
TOTAL					7.05E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.24E+00	6.38E-05	3.15E-05
D-E	1.97E+00	2.40E-05	1.18E-05
E-F	2.00E-01	2.44E-06	1.20E-06
SSOD	4.33E-01	5.27E-06	2.60E-06
TOTAL	7.85E+00	9.55E-05	4.71E-05

CPC SCREENING | **CHRYSENE RISK CRITERIA :** 2.70E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.45E-05	YES	3.05E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	2.96E-06	YES	2.96E-03	YES	Sub581	2.12E-06	YES	9.15E-04	YES
Sub575	1.00E-06	YES	1.00E-03	YES	Sub582	2.51E-08	YES	2.51E-05	YES

CHEMICAL: CHRYSENE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.24E+00	4.03E-02	2.05E-01	6.75E-02
Single storm adsorbed contaminant quantity PXi (g):	2.10E+01	1.70E-01	9.11E-01	1.50E-01
Annual adsorbed contaminant quantity (g):	9.08E+02	1.29E+00	8.18E+00	2.50E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.45E-05	6.40E-07	2.96E-06	1.00E-06
Single storm dissolved contaminant quantity PQi (g):	1.66E-01	2.18E-03	1.67E-02	3.49E-03
Annual dis. conta. qt (based on sediment yield)(g):	7.20E+00	1.65E-02	1.50E-01	5.84E-02
Annual dis. conta. qt (based on runoff) (g):	2.71E+00	3.63E-02	2.80E-01	5.84E-02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.11E+00	1.28E-01	1.54E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	8.76E+00	1.11E+01	1.47E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	2.89E+01	1.85E+02	3.80E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.75E-05	2.12E-06	2.51E-08
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.49E-01	2.70E-02	2.62E-04
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.15E+00	4.49E-01	6.77E-03
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.79E+00	4.49E-01	4.49E-03

PADDYS RUN BASIN | CHEMICAL: DIBENZO(A,H)ANTHRACENE | SCENARIO: WITH STORMWATER CONTROLS

Baseline

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 6/18/94 14:57

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.09E-06	1.97E-02	1.70E+05	2.00E-01	8.19E-07
Sub570	7.04E-08	3.97E-04	1.99E+05	9.68E-01	6.82E-08
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	6.17E-07	7.84E-03	4.49E+05	9.06E-01	5.59E-07
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.09E-06	1.97E-02	6.19E-01
Sub570	7.04E-08	3.97E-04	1.13E-02
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	3.22E-07	7.84E-03	4.53E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.19E-04	1.24E-01
D-D	8.19E-04	1.24E-01
E-E	8.19E-04	1.24E-01
Max:	8.19E-04	1.24E-01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	9.57E-05
Avg. Conc. in GMR	9.60E-06
Max. Conc. in Paddys Run at GMR	6.76E-04
Max. Conc. in GMR at Paddys Run	6.79E-05
Max. Conc. in GMR at Eff. Line (max week)	1.82E-04
Annual Conc. at Eff. Line	1.23E-05
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.02E-01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.03E-02

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sub80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.16E-03	4.56E-06	3.39E-04
D-E	7.5	11.1	13.9		1.52E-03	1.67E-06	1.48E-04
E-F	0.7	1.6	1.1	1.5	2.62E-04	2.87E-07	2.96E-05
SSOD				56.6	4.44E-03	4.86E-06	2.63E-04
TOTAL					1.04E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.04E-01	7.36E-06	3.63E-06
D-E	2.20E-01	2.68E-06	1.32E-06
E-F	2.40E-02	2.92E-07	1.44E-07
SSOD	1.24E-01	1.51E-06	7.44E-07
TOTAL	9.73E-01	1.18E-05	5.84E-06

CPC SCREENING DIBENZO(A,H)ANTHRACENE RISK CRITERIA : 1.10E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.09E-06	NO	3.25E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	7.04E-08	YES	7.04E-05	YES	Sub581	6.17E-07	YES	2.64E-04	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: DIBENZO(A,H)ANTHRACE Baseline

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.19E-01	0.00E+00	1.13E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	5.79E+00	0.00E+00	5.02E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	2.51E+02	0.00E+00	4.51E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.09E-06	0.00E+00	7.04E-08	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.97E-02	0.00E+00	3.97E-04	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	8.53E-01	0.00E+00	3.56E-03	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.22E-01	0.00E+00	6.65E-03	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.46E-01	8.68E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.53E+00	7.55E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.16E+01	1.26E+02	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.02E-06	6.17E-07	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	6.04E-02	7.84E-03	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.99E-01	1.30E-01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.00E+00	1.30E-01	0.00E+00

PADDYS RUN BASIN | CHEMICAL: DIBENZOFURAN | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/24/94 9:52

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.30E-05	1.59E-01	1.70E+05	2.00E-01	6.59E-06
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.30E-05	1.59E-01	7.05E-02
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	6.59E-03	1.41E-02
D-D	6.59E-03	1.41E-02
E-E	6.59E-03	1.41E-02
Max:	6.59E-03	1.41E-02

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	5.43E-04
Avg. Conc. in GMR	5.45E-05
Max. Conc. in Paddys Run at GMR	5.44E-03
Max. Conc. in GMR at Paddys Run	5.46E-04
Max. Conc. in GMR at Eff. Line (max week)	4.65E-04
Annual Conc. at Eff. Line	9.18E-05

Leading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.27E-02	3.58E-05	2.66E-03
D-E	7.5	11.1	13.9		1.19E-02	1.30E-05	1.15E-03
E-F	0.7	1.6	1.1	1.5	1.11E-03	1.22E-06	1.25E-04
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					4.57E-02		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.83E+00	5.88E-05	2.90E-05
D-E	1.76E+00	2.14E-05	1.06E-05
E-F	1.64E-01	2.00E-06	9.86E-07
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.76E+00	8.23E-05	4.06E-05

CPC SCREENING DIBENZOFURAN RISK CRITERIA : 1.50E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.30E-05	YES	2.55E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: DIBENZOFURAN BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.05E-02	1.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.60E-01	4.23E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	2.86E+01	3.21E+01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.30E-05	4.84E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.59E-01	1.64E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	6.87E+00	1.25E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.59E+00	2.74E+01	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.91E-01	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.51E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	4.98E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.13E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.83E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	6.01E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.03E+01	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: HEXACHLOROBUTADIENE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/23/94 12:42

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	3.66E-05
Annual Conc. at Eff. Line	4.26E-06

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | HEXACHLOROBUTADIENE RISK CRITERIA : 2.30E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: HEXACHLOROBUTADIEN BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	7.22E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.72E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.89E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.58E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.51E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.99E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.51E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: INDENO(1,2,3-CD)PYRENE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 12 44

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.08E-07	1.00E-03	1.70E+05	2.00E-01	4.16E-08
Sub570	1.15E-08	6.45E-05	1.99E+05	9.68E-01	1.11E-08
Sub575	4.99E-09	1.74E-05	1.23E+05	2.62E-01	1.31E-09
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	4.72E-08	6.01E-04	4.49E+05	9.06E-01	4.28E-08
Sub582	1.09E-10	1.13E-06	3.68E+05	4.35E-01	4.72E-11

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted sds. Conc. (mg/kg)
Sub 560	2.08E-07	1.00E-03	1.54E+00
Sub570	1.15E-08	6.45E-05	9.01E-02
sub575	4.99E-09	1.74E-05	3.83E-02
Sub 580, 581 & 582	2.47E-08	6.02E-04	1.70E-01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total sds. conc. in Paddys run(mg/kg)
C-C	4.16E-05	3.08E-01
D-D	4.16E-05	3.08E-01
E-E	4.16E-05	3.08E-01
Max:	4.16E-05	3.08E-01

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	5.77E-06
Avg. Conc. in GMR	5.79E-07
Max. Conc. in Paddys Run at GMR	3.43E-05
Max. Conc. in GMR at Paddys Run	3.45E-06
Max. Conc. in GMR at Eff. Line (max week)	4.76E-04
Annual Conc. at Eff. Line	3.06E-05

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.22E-04	2.44E-07	1.81E-05
D-E	7.5	11.1	13.9		8.46E-05	9.27E-08	8.21E-06
E-F	0.7	1.6	1.1	1.5	1.73E-05	1.89E-08	1.95E-06
SSOD				56.6	3.41E-04	3.73E-07	2.02E-05
TOTAL					6.65E-04		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 8 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.12E-02	3.79E-07	1.87E-07
D-E	1.17E-02	1.42E-07	7.00E-08
E-F	1.36E-03	1.65E-08	8.15E-09
SSOD	9.51E-03	1.16E-07	5.71E-08
TOTAL	5.37E-02	6.54E-07	3.22E-07

CPC SCREENING | INDENO(1,2,3-CD)PYRENE RISK CRITERIA : 4.30E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.08E-07	YES	1.76E-05	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	1.15E-08	YES	1.15E-05	YES	Sub581	4.72E-08	YES	2.02E-05	YES
Sub575	4.99E-09	YES	4.99E-06	YES	Sub582	1.09E-10	YES	1.09E-07	YES

CHEMICAL: INDENO(1,2,3-CD)PYREN BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.54E+00	2.58E-02	9.01E-02	3.83E-02
Single storm adsorbed contaminant quantity PXi (g):	1.44E+01	1.09E-01	4.00E-01	8.50E-02
Annual adsorbed contaminant quantity (g):	6.24E+02	8.24E-01	3.60E+00	1.42E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.08E-07	3.59E-09	1.15E-08	4.99E-09
Single storm dissolved contaminant quantity PQi (g):	1.00E-03	1.22E-05	6.45E-05	1.74E-05
Annual dis. conta. qt (based on sediment yield)(g):	4.33E-02	9.25E-05	5.80E-04	2.91E-04
Annual dis. conta. qt (based on runoff) (g):	1.63E-02	2.03E-04	1.08E-03	2.91E-04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.18E+00	3.26E-01	7.60E-04
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	9.32E+00	2.83E+01	7.27E-03
Annual adsorbed contaminant quantity (g):	0.00E+00	3.07E+01	4.71E+02	1.88E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.63E-07	4.72E-08	1.09E-10
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.25E-03	6.01E-04	1.13E-06
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.07E-02	9.99E-03	2.92E-05
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.39E-02	9.99E-03	1.94E-05

PADDYS RUN BASIN | CHEMICAL: ISOPHORONE | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 12:46

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	2.50E-03
Annual Conc. at Eff. Line	7.93E-04

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | ISOPHORONE RISK CRITERIA : 9.00E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: ISOPHORONE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.96E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.55E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.10E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.47E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.93E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.63E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	8.18E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: N-NITROSO-DI-N-PROPYLAMINE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 12:48

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.31E-04	3.52E+00	1.70E+05	2.00E-01	1.46E-04
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Leadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	7.31E-04	3.52E+00	3.67E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.46E-01	7.35E-04
D-D	1.46E-01	7.35E-04
E-E	1.46E-01	7.35E-04
Max:	1.46E-01	7.35E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.21E-02
Avg. Conc. in GMR	1.21E-03
Max. Conc. in Paddys Run at GMR	1.21E-01
Max. Conc. in GMR at Paddys Run	1.21E-02
Max. Conc. in GMR at Eff. Line (max week)	0.00E+00
Annual Conc. at Eff. Line	0.00E+00

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.25E-01	7.95E-04	5.91E-02
D-E	7.5	11.1	13.9		2.64E-01	2.89E-04	2.56E-02
E-F	0.7	1.6	1.1	1.5	2.46E-02	2.70E-05	2.78E-03
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.01E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.07E+02	1.31E-03	6.44E-04
D-E	3.90E+01	4.75E-04	2.34E-04
E-F	3.64E+00	4.44E-05	2.19E-05
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.50E+02	1.83E-03	9.00E-04

CPC SCREENING N-NITROSO-DI-N-PROPYLAMINE RISK CRITERIA : 1.20E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.31E-04	NO	5.67E-02	NO	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: N-NITROSO-DI-N-PROPYL BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.67E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.44E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.49E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.31E-04	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.52E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.52E+02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	5.75E+01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: N-NITROSODIPHENYLAMINE | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 5/23/94 12:49

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Great Miami River (ug/l)

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	6.10E-04
Annual Conc. at Eff. Line	1.82E-04

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING — N-NITROSODIPHENYLAMINE RISK CRITERIA : 1.70E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: N-NITROSODIPHENYLAMI BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.19E-01	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	9.42E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.10E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.57E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.11E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.67E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.85E+02	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: TRIBUTYL PHOSPHATE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: | Investigator DCW | Date 5/23/94 12 51

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	8.90E-06	4.28E-02	1.70E+05	2.00E-01	1.78E-06
Sub570	5.11E-06	2.88E-02	1.99E+05	9.68E-01	4.95E-06
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	2.10E-05	2.67E-01	4.49E+05	9.06E-01	1.90E-05
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	8.90E-06	4.28E-02	1.44E-02
Sub570	5.11E-06	2.88E-02	8.79E-03
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	1.10E-05	2.67E-01	1.65E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.00E-03	8.60E-03
D-D	5.00E-03	8.60E-03
E-E	8.51E-03	1.33E-02
Max:	8.51E-03	1.33E-02

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.16E-03
Avg. Conc. in GMR	1.16E-04
Max. Conc. in Paddys Run at GMR	7.03E-03
Max. Conc. in GMR at Paddys Run	7.06E-04
Max. Conc. in GMR at Eff. Line (max week)	2.99E-04
Annual Conc. at Eff. Line	6.57E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.61E-02	1.76E-05	1.31E-03
D-E	7.5	11.1	13.9		6.41E-03	7.02E-06	6.22E-04
E-F	0.7	1.6	1.1	1.5	4.77E-03	5.23E-06	5.39E-04
SSOD				56.6	1.51E-01	1.66E-04	8.98E-03
TOTAL					1.79E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.61E+00	1.96E-05	9.69E-06
D-E	6.11E-01	7.44E-06	3.67E-06
E-F	1.78E-01	2.17E-06	1.07E-06
SSOD	4.22E+00	5.14E-05	2.53E-05
TOTAL	6.62E+00	8.06E-05	3.98E-05

CPC SCREENING | TRIBUTYL PHOSPHATE RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	8.90E-06	YES	1.26E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	5.11E-06	YES	1.26E-03	YES	Sub581	2.10E-05	YES	8.98E-03	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: TRIBUTYL PHOSPHATE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.44E-02	0.00E+00	8.79E-03	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.35E-01	0.00E+00	3.91E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	5.83E+00	0.00E+00	3.51E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	8.90E-06	0.00E+00	5.11E-06	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	4.28E-02	0.00E+00	2.88E-02	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.85E+00	0.00E+00	2.59E-01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	7.00E-01	0.00E+00	4.83E-01	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.88E-01	3.16E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.28E+00	2.75E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	7.51E+00	4.57E+01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.82E-04	2.10E-05	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.64E+00	2.67E-01	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.20E+01	4.44E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.03E+01	4.44E+00	0.00E+00

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PADDYS RUN BASIN | CHEMICAL: ALDRIN | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 13 39

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	5.60E-08
Annual Conc. at Eff. Line	5.11E-09

Loading to the Great Miami Aquifer — Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING — ALDRIN RISK CRITERIA : 5.00E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: ALDRIN BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.25E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	9.87E-04	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.25E-03	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.11E-09	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.22E-04	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.03E-04	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.03E-03	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: ALPHA-CHLORDANE | SCENARIO: WITH STORMWATER CONTROLS BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 13:41

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	8.14E-06
Annual Conc. at Eff. Line	2.51E-06

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING ALPHA-CHLORDANE RISK CRITERIA : 6.60E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: ALPHA-CHLORDANE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	7.41E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.87E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.93E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.77E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.55E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.12E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.58E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: AROCLOR-1254 | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 13:43

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.14E-06	1.03E-02	1.70E+05	2.00E-01	4.29E-07
Sub570	3.43E-07	1.93E-03	1.99E+05	9.68E-01	3.32E-07
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	1.04E-06	1.32E-02	4.49E+05	9.06E-01	9.41E-07
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.14E-06	1.03E-02	3.72E-01
Sub570	3.43E-07	1.93E-03	6.40E-02
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	5.42E-07	1.32E-02	8.75E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.29E-04	7.43E-02
D-D	4.29E-04	7.43E-02
E-E	4.98E-04	8.26E-02
Max:	4.98E-04	8.26E-02

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	8.72E-05
Avg. Conc. in GMR	8.75E-06
Max. Conc. in Paddys Run at GMR	4.11E-04
Max. Conc. in GMR at Paddys Run	4.13E-05
Max. Conc. in GMR at Eff. Line (max week)	8.60E-04
Annual Conc. at Eff. Line	5.84E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.61E-03	2.86E-06	2.13E-04
D-E	7.5	11.1	13.9		9.88E-04	1.08E-06	9.59E-05
E-F	0.7	1.6	1.1	1.5	3.01E-04	3.30E-07	3.40E-05
SSOD				56.6	7.48E-03	8.19E-06	4.44E-04
TOTAL					1.14E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.35E-01	4.08E-06	2.01E-06
D-E	1.23E-01	1.50E-06	7.41E-07
E-F	1.77E-02	2.15E-07	1.06E-07
SSOD	2.09E-01	2.54E-06	1.25E-06
TOTAL	6.85E-01	8.34E-06	4.11E-06

CPC SCREENING | AROCLOR-1254 RISK CRITERIA : 1.10E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.14E-06	NO	2.04E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	3.43E-07	YES	2.04E-04	YES	Sub581	1.04E-06	YES	4.44E-04	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: AROCLOR-1254 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.72E-01	4.83E-02	6.40E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.48E+00	2.04E-01	2.84E-01	0.00E+00
Annual adsorbed contaminant quantity (g):	1.51E+02	1.54E+00	2.55E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.14E-06	2.87E-07	3.43E-07	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.03E-02	9.76E-04	1.93E-03	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	4.46E-01	7.41E-03	1.74E-02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.68E-01	1.63E-02	3.24E-02	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.09E+00	1.68E-01	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.66E+01	1.46E+01	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.46E+01	2.42E+02	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.24E-05	1.04E-06	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.47E-01	1.32E-02	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	8.14E-01	2.20E-01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	4.10E+00	2.20E-01	0.00E+00

PADDYS RUN BASIN | CHEMICAL: AROCLOR-1260 | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/23/94 13:45

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.74E-08	3.73E-04	1.70E+05	2.00E-01	1.55E-08
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	7.74E-08	3.73E-04	1.64E-02
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.55E-05	3.28E-03
D-D	1.55E-05	3.28E-03
E-E	1.55E-05	3.28E-03
Max:	1.55E-05	3.28E-03

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	1.28E-06
Avg. Conc. in GMR	1.28E-07
Max. Conc. in Paddys Run at GMR	1.28E-05
Max. Conc. in GMR at Paddys Run	1.28E-06
Max. Conc. in GMR at Eff. Line (max week)	3.34E-04
Annual Conc. at Eff. Line	2.21E-05

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.68E-05	8.41E-08	6.26E-06
D-E	7.5	11.1	13.9		2.80E-05	3.06E-08	2.71E-06
E-F	0.7	1.6	1.1	1.5	2.61E-06	2.86E-09	2.95E-07
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.07E-04		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.13E-02	1.38E-07	6.81E-08
D-E	4.13E-03	5.03E-08	2.48E-08
E-F	3.86E-04	4.70E-09	2.32E-09
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.59E-02	1.93E-07	9.53E-08

CPC SCREENING | AROCLOR-1260 RISK CRITERIA : 1.10E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.74E-08	YES	6.00E-06	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: AROCLOR-1260 BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.64E-02	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.54E-01	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	6.65E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.74E-08	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.73E-04	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.61E-02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	6.09E-03	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	8.24E-01	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	6.53E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.15E+01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.04E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	8.07E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.66E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.34E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: BETA-BHC | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/23/94 13 47

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	2.98E-05
Annual Conc. at Eff. Line	7.33E-06

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Leading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | BETA-BHC RISK CRITERIA : 4.70E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: BETA-BHC BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.11E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.67E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.52E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.12E-05	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.23E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.39E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	7.02E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: DIELDRIN | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date 5/23/94 13:49

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.82E-06	3.76E-02	1.70E+05	2.00E-01	1.56E-06
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	7.82E-06	3.76E-02	1.58E-02
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.56E-03	3.16E-03
D-D	1.56E-03	3.16E-03
E-E	1.56E-03	3.16E-03
Max:	1.56E-03	3.16E-03

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.29E-04
Avg. Conc. in GMR	1.29E-05
Max. Conc. in Paddys Run at GMR	1.29E-03
Max. Conc. in GMR at Paddys Run	1.30E-04
Max. Conc. in GMR at Eff. Line (max week)	3.46E-06
Annual Conc. at Eff. Line	6.93E-07

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.75E-03	8.50E-06	6.32E-04
D-E	7.5	11.1	13.9		2.82E-03	3.09E-06	2.74E-04
E-F	0.7	1.6	1.1	1.5	2.64E-04	2.89E-07	2.98E-05
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.08E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.15E+00	1.40E-05	6.88E-06
D-E	4.17E-01	5.08E-06	2.51E-06
E-F	3.90E-02	4.74E-07	2.34E-07
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.60E+00	1.95E-05	9.62E-06

CPC SCREENING | DIELDRIN RISK CRITERIA : 5.30E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.82E-06	NO	6.06E-04	NO	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: DIELDRIN BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.58E-02	7.23E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.48E-01	3.05E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	6.40E+00	2.31E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.82E-06	3.74E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.76E-02	1.27E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.63E+00	9.64E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	6.15E-01	2.12E-01	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.39E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.10E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.62E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.13E-07	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.43E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.70E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.36E-01	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: HEPTACHLOR EPOXIDE | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 13:50

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	0.00E+00	0.00E+00
Max:	0.00E+00	0.00E+00

Great Miami River ug/l

Avg. Conc. in Paddys Run at GMR	0.00E+00
Avg. Conc. in GMR	0.00E+00
Max. Conc. in Paddys Run at GMR	0.00E+00
Max. Conc. in GMR at Paddys Run	0.00E+00
Max. Conc. in GMR at Eff. Line (max week)	6.26E-06
Annual Conc. at Eff. Line	1.95E-06

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass leading (g)	Max. daily mass leading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.1	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.7	1.6	1.1	1.5	0.00E+00	0.00E+00	0.00E+00
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					0.00E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	0.00E+00	0.00E+00	0.00E+00
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	0.00E+00	0.00E+00	0.00E+00

CPC SCREENING | HEPTACHLOR EPOXIDE RISK CRITERIA : 2.00E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: HEPTACHLOR EPOXIDE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.30E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.40E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.12E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.03E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.21E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.97E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: HEPTACHLORODIBENZOFURANS | SCENARIO: WITH STORMWATER CONTROLS

BASELINE

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/24/94 9:47

Subbasin	Co Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.81E-11	1.83E-07	1.70E+05	2.00E-01	7.61E-12
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.81E-11	1.83E-07	4.04E-06
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	7.61E-09	8.08E-07
D-D	7.61E-09	8.08E-07
E-E	7.61E-09	8.08E-07
Max:	7.61E-09	8.08E-07

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	6.27E-10
Avg. Conc. in GMR	6.29E-11
Max. Conc. in Paddys Run at GMR	6.29E-09
Max. Conc. in GMR at Paddys Run	6.31E-10
Max. Conc. in GMR at Eff. Line (max week)	2.20E-08
Annual Conc. at Eff. Line	1.52E-09

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.77E-08	4.13E-11	3.08E-09
D-E	7.5	11.1	13.9		1.37E-08	1.51E-11	1.33E-09
E-F	0.7	1.6	1.1	1.5	1.28E-09	1.41E-12	1.45E-10
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					5.28E-08		

Total Mass Leading Per Year

Cross Section	Total Mass Leading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.58E-06	6.79E-11	3.35E-11
D-E	2.03E-06	2.47E-11	1.22E-11
E-F	1.90E-07	2.31E-12	1.14E-12
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	7.80E-06	9.50E-11	4.68E-11

CPC SCREENING | HEPTACHLORODIBENZOFURANS RISK CRITERIA : 5.70E-06 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.81E-11	YES	2.95E-09	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: HEPTACHLORODIBENZO BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.04E-06	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.78E-05	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.64E-03	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.81E-11	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.83E-07	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	7.93E-06	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.99E-06	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.38E-05	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.26E-04	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.40E-03	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.15E-10	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.03E-05	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.39E-05	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.71E-04	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: ENDRIN ALDEHYDE | SCENARIO: WITH STORMWATER CONTROLS
BASELINE

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 13:52

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.15E-05	5.52E-02	1.70E+05	2.00E-01	2.29E-06
Sub570	0.00E+00	0.00E+00	1.99E+05	9.68E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.62E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	1.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	9.06E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	4.35E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.15E-05	5.52E-02	2.60E-03
Sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(mg/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.29E-03	5.20E-04
D-D	2.29E-03	5.20E-04
E-E	2.29E-03	5.20E-04
Max:	2.29E-03	5.20E-04

Great Miami River	ug/l
Avg. Conc. in Paddys Run at GMR	1.89E-04
Avg. Conc. in GMR	1.90E-05
Max. Conc. in Paddys Run at GMR	1.89E-03
Max. Conc. in GMR at Paddys Run	1.90E-04
Max. Conc. in GMR at Eff. Line (max week)	0.00E+00
Annual Conc. at Eff. Line	0.00E+00

Leading to the Great Miami Aquifer

Total Mass Leading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.14E-02	1.24E-05	9.26E-04
D-E	7.5	11.1	13.9		4.14E-03	4.53E-06	4.01E-04
E-F	0.7	1.6	1.1	1.5	3.86E-04	4.23E-07	4.36E-05
SSOD				56.6	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.59E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.68E+00	2.04E-05	1.01E-05
D-E	6.11E-01	7.45E-06	3.67E-06
E-F	5.71E-02	6.95E-07	3.43E-07
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	2.35E+00	2.86E-05	1.41E-05

CPC SCREENING | ENDRIN ALDEHYDE RISK CRITERIA : 1.10E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.15E-05	YES	8.88E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

CHEMICAL: ENDRIN ALDEHYDE BASELINE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.60E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.43E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.05E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.15E-05	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	5.52E-02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.39E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	9.01E-01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

6161

Attachment F.2.III

Surface Water Model Outputs
Future Conditions

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** ACTINIUM-227 +7D | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 19:52

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.63E-15	1.13E-10	7.06E+05	9.28E-01	5.22E-15
Sub581	6.94E-15	8.82E-11	4.49E+05	4.17E-01	2.89E-15
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	4.53E-15	2.01E-10	3.04E-10

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	4.46E-12	2.99E-10
Max:	4.46E-12	2.99E-10

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.39E-13
Avg. Conc. in GMR (ug/l)	6.71E-14
Max. Conc. in Paddys Run at GMR (ug/l)	3.72E-12
Max. Conc. in GMR (ug/l)	3.91E-13

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	2.21E-12	2.42E-15	2.45E-13
SSOD				49.2	9.88E-11	1.08E-13	3.97E-12
TOTAL					1.01E-10		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	7.07E-11	8.61E-16	4.25E-16
SSOD	3.16E-09	3.85E-14	1.90E-14
TOTAL	3.23E-09	3.94E-14	1.94E-14

CPC SCREENING **ACTINIUM-227 +7D RISK CRITERIA :** 1.93E-10 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	5.63E-15	YES	3.97E-12	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	6.94E-15	YES	3.97E-12	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: ACTINIUM-227 +7D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.85E-10	4.53E-10	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.05E-09	3.94E-08	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.01E-08	6.55E-07	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.63E-15	6.94E-15	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.13E-10	8.82E-11	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.71E-10	1.47E-09	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.87E-09	1.47E-09	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: CESIUM-137 +1D | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19 54

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.16E-14	2.00E-10	1.70E+05	2.00E-01	8.32E-15
WPA	2.64E-14	8.97E-11	1.20E+05	5.09E-01	1.34E-14
Sub570	5.66E-14	3.19E-10	1.99E+05	6.25E-01	3.54E-14
Sub575	2.62E-14	9.12E-11	1.23E+05	2.11E-01	5.52E-15
Sub580	2.02E-14	2.48E-11	4.34E+04	4.40E-02	8.88E-16
PDAR	3.30E-14	6.59E-10	7.06E+05	9.28E-01	3.06E-14
Sub581	3.61E-14	4.59E-10	4.49E+05	4.17E-01	1.50E-14
Sub582	3.70E-14	3.86E-10	3.68E+05	2.97E-01	1.10E-14

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.16E-14	2.00E-10	2.18E-09
WPA & sub570	4.53E-14	4.09E-10	2.50E-09
sub575	2.62E-14	9.12E-11	1.40E-09
Sub 580,PDAR, 581 & 582	3.45E-14	1.53E-09	1.74E-09

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.53E-11	2.50E-09
D-D	4.53E-11	2.50E-09
E-E	4.53E-11	2.50E-09
Max:	4.53E-11	2.50E-09

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.09E-12
Avg. Conc. in GMR (ug/l)	7.45E-13
Max. Conc. in Paddys Run at GMR (ug/l)	3.78E-11
Max. Conc. in GMR (ug/l)	3.97E-12

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.44E-10	1.58E-13	1.10E-11
D-E	7.5	11.3	13.9		7.39E-11	8.10E-14	6.91E-12
E-F	0.6	1.4	1.0	1.1	2.47E-11	2.70E-14	2.74E-12
SSOD				49.2	7.52E-10	8.24E-13	3.02E-11
TOTAL					9.95E-10		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.05E-08	1.28E-13	6.31E-14
D-E	5.54E-09	6.75E-14	3.33E-14
E-F	1.17E-09	1.42E-14	7.01E-15
SSOD	2.76E-08	3.36E-13	1.65E-13
TOTAL	4.48E-08	5.45E-13	2.69E-13

CPC SCREENING | CESIUM-137 +1D RISK CRITERIA : 1.97E-09 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4 16E-14	YES	1.16E-11	YES	Sub580	2.02E-14	YES	2.02E-11	YES
WPA	2.64E-14	YES	1.16E-11	YES	PDAR	3.30E-14	YES	3.02E-11	YES
Sub570	5.66E-14	YES	1.16E-11	YES	Sub581	3.61E-14	YES	3.02E-11	YES
Sub575	2.62E-14	YES	1.16E-11	YES	Sub582	3.70E-14	YES	3.02E-11	YES

DRAFT

CHEMICAL: CESIUM-137 +1D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.18E-09	1.36E-09	3.18E-09	1.40E-09
Single storm adsorbed contaminant quantity PXi (g):	2.04E-08	5.71E-09	1.41E-08	3.12E-09
Annual adsorbed contaminant quantity (g):	8.84E-07	4.33E-08	1.27E-07	5.21E-08
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.16E-14	2.64E-14	5.66E-14	2.62E-14
Single storm dissolved contaminant quantity PQi (g):	2.00E-10	8.97E-11	3.19E-10	9.12E-11
Annual dis. conta. qt (based on sediment yield)(g):	8.67E-09	6.81E-10	2.87E-09	1.52E-09
Annual dis. conta. qt (based on runoff) (g):	3.27E-09	1.50E-09	5.35E-09	1.52E-09

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.16E-09	1.70E-09	1.78E-09	1.85E-09
Single storm adsorbed contaminant quantity PXi (g):	5.90E-09	1.35E-08	1.55E-07	1.77E-08
Annual adsorbed contaminant quantity (g):	9.18E-08	4.45E-08	2.57E-06	4.57E-07
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.02E-14	3.30E-14	3.61E-14	3.70E-14
Single storm dissolved contaminant quantity PQi (g):	2.48E-11	6.59E-10	4.59E-10	3.86E-10
Annual dis. conta. qt (based on sediment yield)(g):	3.86E-10	2.17E-09	7.63E-09	9.96E-09
Annual dis. conta. qt (based on runoff) (g):	4.07E-10	1.09E-08	7.63E-09	6.61E-09

PADDYS RUN BASIN | CHEMICAL: NEPTUNIUM-237 +1D | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 19:55

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.69E-07	2.74E-03	1.70E+05	2.00E-01	1.14E-07
WPA	3.05E-07	1.03E-03	1.20E+05	5.09E-01	1.55E-07
Sub570	2.66E-07	1.50E-03	1.99E+05	6.25E-01	1.66E-07
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	3.91E-07	7.81E-03	7.06E+05	9.28E-01	3.63E-07
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.69E-07	2.74E-03	9.07E-04
WPA & sub570	2.81E-07	2.53E-03	4.62E-04
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.76E-07	7.81E-03	2.76E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.81E-04	4.62E-04
D-D	2.81E-04	4.62E-04
E-E	2.81E-04	4.62E-04
Max:	2.81E-04	4.62E-04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.16E-05
Avg. Conc. in GMR (ug/l)	4.37E-06
Max. Conc. in Paddys Run at GMR (ug/l)	2.34E-04
Max. Conc. in GMR (ug/l)	2.46E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.20E-03	1.32E-06	9.17E-05
D-E	7.5	11.3	13.9		4.92E-04	5.39E-07	4.60E-05
E-F	0.6	1.4	1.0	1.1	1.38E-04	1.51E-07	1.53E-05
SSOD				49.2	3.84E-03	4.21E-06	1.55E-04
TOTAL					5.68E-03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.11E-01	1.35E-06	6.66E-07
D-E	4.27E-02	5.20E-07	2.56E-07
E-F	6.90E-03	8.40E-08	4.14E-08
SSOD	1.23E-01	1.50E-06	7.38E-07
TOTAL	2.83E-01	3.45E-06	1.70E-06

CPC SCREENING | NEPTUNIUM-237 +1D RISK CRITERIA : 3.12E-05 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.69E-07	NO	8.81E-05	NO	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	3.05E-07	NO	8.81E-05	NO	PDAR	3.91E-07	NO	1.55E-04	NO
Sub570	2.66E-07	NO	8.81E-05	NO	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: NEPTUNIUM-237 +1D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	9.07E-04	4.75E-04	4.55E-04	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	8.49E-03	2.00E-03	2.02E-03	0.00E+00
Annual adsorbed contaminant quantity (g):	3.68E-01	1.52E-02	1.81E-02	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.69E-07	3.05E-07	2.66E-07	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.74E-03	1.03E-03	1.50E-03	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.19E-01	7.85E-03	1.35E-02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.48E-02	1.73E-02	2.51E-02	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.13E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.86E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.60E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.91E-07	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	7.81E-03	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.57E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.30E-01	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: PLUTONIUM-238 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 19 57

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.90E-14	9.13E-11	1.70E+05	2.00E-01	3.79E-15
WPA	1.97E-13	6.68E-10	1.20E+05	5.09E-01	1.00E-13
Sub570	3.71E-13	2.09E-09	1.99E+05	6.25E-01	2.32E-13
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	7.04E-12	1.41E-07	7.06E+05	9.28E-01	6.54E-12
Sub581	1.27E-12	1.62E-08	4.49E+05	4.17E-01	5.31E-13
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.90E-14	9.13E-11	9.34E-10
WPA & sub570	3.06E-13	2.76E-09	1.58E-08
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.54E-12	1.57E-07	1.71E-07

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.06E-10	1.58E-08
D-D	3.06E-10	1.58E-08
E-E	3.49E-09	1.69E-07
Max:	3.49E-09	1.69E-07

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.08E-10
Avg. Conc. in GMR (ug/l)	5.34E-11
Max. Conc. in Paddys Run at GMR (ug/l)	2.91E-09
Max. Conc. in GMR (ug/l)	3.06E-10

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.14E-10	7.83E-13	5.44E-11
D-E	7.5	11.3	13.9		3.19E-10	3.49E-13	2.98E-11
E-F	0.6	1.4	1.0	1.1	1.77E-09	1.94E-12	1.96E-10
SSOD				49.2	7.72E-08	8.46E-11	3.10E-09
TOTAL					8.00E-08		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.24E-08	3.94E-13	1.94E-13
D-E	1.43E-08	1.74E-13	8.58E-14
E-F	5.72E-08	6.96E-13	3.43E-13
SSOD	2.47E-06	3.01E-11	1.48E-11
TOTAL	2.57E-06	3.13E-11	1.55E-11

CPC SCREENING | PLUTONIUM-238 RISK CRITERIA : 1.29E-09 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.90E-14	YES	1.90E-11	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	1.97E-13	YES	5.23E-11	YES	PDAR	7.04E-12	NO	3.10E-09	NO
Sub570	3.71E-13	YES	5.23E-11	YES	Sub581	1.27E-12	YES	1.27E-09	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: PLUTONIUM-238 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	9.34E-10	9.48E-09	1.96E-08	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	8.74E-09	3.99E-08	8.71E-08	0.00E+00
Annual adsorbed contaminant quantity (g):	3.78E-07	3.03E-07	7.82E-07	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.90E-14	1.97E-13	3.71E-13	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	9.13E-11	6.68E-10	2.09E-09	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.95E-09	5.07E-09	1.88E-08	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.49E-09	1.11E-08	3.51E-08	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.42E-07	5.89E-08	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.71E-06	5.12E-06	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	8.92E-06	8.52E-05	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.04E-12	1.27E-12	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.41E-07	1.62E-08	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.64E-07	2.69E-07	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.33E-06	2.69E-07	0.00E+00

PADDYS RUN BASIN | CHEMICAL: PLUTONIUM-239/240 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 19:59

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.19E-11	5.75E-08	1.70E+05	2.00E-01	2.39E-12
WPA	2.86E-11	9.71E-08	1.20E+05	5.09E-01	1.46E-11
Sub570	5.68E-11	3.20E-07	1.99E+05	6.25E-01	3.55E-11
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.78E-10	1.16E-05	7.06E+05	9.28E-01	5.37E-10
Sub581	2.27E-10	2.89E-06	4.49E+05	4.17E-01	9.47E-11
Sub582	2.02E-10	2.11E-06	3.68E+05	2.97E-01	6.00E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.19E-11	5.75E-08	5.88E-07
WPA & sub570	4.62E-11	4.17E-07	2.39E-06
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.73E-10	1.66E-05	1.79E-05

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.62E-08	2.39E-06
D-D	4.62E-08	2.39E-06
E-E	3.68E-07	1.76E-05
Max:	3.68E-07	1.76E-05

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.42E-08
Avg. Conc. in GMR (ug/l)	5.69E-09
Max. Conc. in Paddys Run at GMR (ug/l)	3.07E-07
Max. Conc. in GMR (ug/l)	3.23E-08

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.17E-07	1.28E-10	8.91E-09
D-E	7.5	11.3	13.9		5.14E-08	5.64E-11	4.81E-09
E-F	0.6	1.4	1.0	1.1	1.88E-07	2.06E-10	2.09E-08
SSOD				49.2	8.14E-06	8.92E-09	3.27E-07
TOTAL					8.50E-06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.23E-06	7.58E-11	3.74E-11
D-E	2.64E-06	3.22E-11	1.59E-11
E-F	6.58E-06	8.02E-11	3.95E-11
SSOD	2.80E-04	3.40E-09	1.68E-09
TOTAL	2.95E-04	3.59E-09	1.77E-09

CPC SCREENING | PLUTONIUM-239/240 RISK CRITERIA : 3.38E-07 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.19E-11	YES	8.56E-09	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	2.86E-11	YES	8.56E-09	YES	PDAR	5.78E-10	NO	3.27E-07	YES
Sub570	5.68E-11	YES	8.56E-09	YES	Sub581	2.27E-10	YES	2.27E-07	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	2.02E-10	YES	2.02E-07	YES

CHEMICAL: PLUTONIUM-239/240 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.88E-07	1.38E-06	3.00E-06	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	5.50E-06	5.81E-06	1.33E-05	0.00E+00
Annual adsorbed contaminant quantity (g):	2.38E-04	4.41E-05	1.20E-04	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.19E-11	2.86E-11	5.68E-11	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	5.75E-08	9.71E-08	3.20E-07	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.49E-06	7.37E-07	2.87E-06	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	9.39E-07	1.62E-06	5.36E-06	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.80E-05	1.05E-05	9.48E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.22E-04	9.14E-04	9.07E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	7.32E-04	1.52E-02	2.34E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.78E-10	2.27E-10	2.02E-10
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.16E-05	2.89E-06	2.11E-06
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.81E-05	4.80E-05	5.44E-05
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.92E-04	4.80E-05	3.61E-05

PADDYS RUN BASIN | CHEMICAL: PROTACTINIUM-231 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20 01

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	9.08E-11	1.81E-06	7.06E+05	9.28E-01	8.42E-11
Sub581	1.59E-11	2.02E-07	4.49E+05	4.17E-01	6.63E-12
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	4.55E-11	2.02E-06	3.49E-06

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454 0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370 0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378 0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	4.48E-08	3.43E-06
Max:	4.48E-08	3.43E-06

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.42E-09
Avg. Conc. in GMR (ug/l)	6.74E-10
Max. Conc. in Paddys Run at GMR (ug/l)	3.74E-08
Max. Conc. in GMR (ug/l)	3.93E-09

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	2.22E-08	2.43E-11	2.46E-09
SSOD				49.2	9.92E-07	1.09E-09	3.99E-08
TOTAL					1.01E-06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	7.10E-07	8.64E-12	4.26E-12
SSOD	3.17E-05	3.86E-10	1.91E-10
TOTAL	3.24E-05	3.95E-10	1.95E-10

CPC SCREENING | PROTACTINIUM-231 RISK CRITERIA : 1.10E-06 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	9.08E-11	YES	3.99E-08	YES
Sub570	0.00E+00	YES	0 00E+00	YES	Sub581	1.59E-11	YES	1.59E-08	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: PROTACTINIUM-231 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.99E-06	1.17E-06	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.54E-05	1.02E-04	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.83E-04	1.69E-03	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.08E-11	1.59E-11	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.81E-06	2.02E-07	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.98E-06	3.36E-06	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.01E-05	3.36E-06	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** RADIUM-226 + SD | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20:03

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.86E-09	8.97E-06	1.70E+05	2.00E-01	3.73E-10
WPA	8.09E-10	2.75E-06	1.20E+05	5.09E-01	4.12E-10
Sub570	1.47E-10	8.29E-07	1.99E+05	6.25E-01	9.20E-11
Sub575	3.68E-11	1.28E-07	1.23E+05	2.11E-01	7.76E-12
Sub580	1.33E-11	1.64E-08	4.34E+04	4.40E-02	5.87E-13
PDAR	1.06E-08	2.12E-04	7.06E+05	9.28E-01	9.82E-09
Sub581	1.30E-10	1.66E-06	4.49E+05	4.17E-01	5.43E-11
Sub582	5.56E-11	5.80E-07	3.68E+05	2.97E-01	1.65E-11

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.86E-09	8.97E-06	3.76E-05
WPA & sub570	3.96E-10	3.58E-06	7.99E-06
sub575	3.68E-11	1.28E-07	7.59E-07
Sub 580,PDAR, 581 & 582	4.82E-09	2.14E-04	9.57E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.96E-07	7.99E-06
D-D	3.96E-07	7.99E-06
E-E	4.75E-06	9.43E-05
Max:	4.75E-06	9.43E-05

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.20E-07
Avg. Conc. in GMR (ug/l)	7.57E-08
Max. Conc. in Paddys Run at GMR (ug/l)	3.97E-06
Max. Conc. in GMR (ug/l)	4.17E-07

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.75E-06	3.01E-09	2.10E-07
D-E	7.5	11.3	13.9		1.09E-06	1.20E-09	1.02E-07
E-F	0.6	1.4	1.0	1.1	2.46E-06	2.69E-09	2.73E-07
SSOD				49.2	1.05E-04	1.15E-07	4.23E-06
TOTAL					1.11E-04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.12E-04	3.80E-09	1.88E-09
D-E	1.19E-04	1.45E-09	7.14E-10
E-F	8.59E-05	1.05E-09	5.15E-10
SSOD	3.37E-03	4.10E-08	2.02E-08
TOTAL	3.89E-03	4.73E-08	2.33E-08

CPC SCREENING | **RADIUM-226 + SD RISK CRITERIA :** 5.96E-09 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.86E-09	NO	2.03E-07	NO	Sub580	1.33E-11	NO	1.33E-08	NO
WPA	8.09E-10	NO	2.03E-07	NO	PDAR	1.06E-08	NO	4.23E-06	NO
Sub570	1.47E-10	NO	1.47E-07	NO	Sub581	1.30E-10	NO	1.30E-07	NO
Sub575	3.68E-11	NO	3.68E-08	NO	Sub582	5.56E-11	NO	5.56E-08	NO

DRAFT

CHEMICAL: RADIUM-226 + 8D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.76E-05	1.60E-05	3.18E-06	7.59E-07
Single storm adsorbed contaminant quantity PXi (g):	3.52E-04	6.72E-05	1.41E-05	1.68E-06
Annual adsorbed contaminant quantity (g):	1.52E-02	5.10E-04	1.27E-04	2.82E-05
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.86E-09	8.09E-10	1.47E-10	3.68E-11
Single storm dissolved contaminant quantity PQi (g):	8.97E-06	2.75E-06	8.29E-07	1.28E-07
Annual dis. conta. qt (based on sediment yield)(g):	3.88E-04	2.08E-05	7.45E-06	2.14E-06
Annual dis. conta. qt (based on runoff) (g):	1.47E-04	4.58E-05	1.39E-05	2.14E-06

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.94E-07	2.10E-04	2.47E-06	1.07E-06
Single storm adsorbed contaminant quantity PXi (g):	1.50E-06	1.67E-03	2.15E-04	1.02E-05
Annual adsorbed contaminant quantity (g):	2.33E-05	5.49E-03	3.57E-03	2.64E-04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.33E-11	1.06E-08	1.30E-10	5.56E-11
Single storm dissolved contaminant quantity PQi (g):	1.64E-08	2.12E-04	1.66E-06	5.80E-07
Annual dis. conta. qt (based on sediment yield)(g):	2.55E-07	6.97E-04	2.76E-05	1.50E-05
Annual dis. conta. qt (based on runoff) (g):	2.69E-07	3.51E-03	2.76E-05	9.93E-06

DRAFT

PADDYS RUN BASIN | CHEMICAL: RUTHENIUM-106 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS. | Investigator: DCW | Date: 5/30/94 10 12

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	2.42E-35	1.36E-31	1.99E+05	6.25E-01	1.51E-35
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.25E-35	1.05E-30	7.06E+05	9.28E-01	4.87E-35
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	18.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	1.51E-35	1.36E-31	3.75E-31
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.37E-35	1.05E-30	5.40E-31

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.51E-32	3.75E-31
D-D	1.51E-32	3.75E-31
E-E	2.35E-32	5.38E-31
Max:	2.35E-32	5.38E-31

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.77E-33
Avg. Conc. in GMR (ug/l)	3.96E-34
Max. Conc. in Paddys Run at GMR (ug/l)	1.97E-32
Max. Conc. in GMR (ug/l)	2.06E-33
Max. Sed. Conc. in P.R. at GMR (mg/kg)	4.49E-31
Max. Sed. Conc. in GMR at P.R. (mg/kg)	4.72E-32

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.44E-32	3.76E-35	2.62E-33
D-E	7.5	11.3	13.9		1.54E-32	1.69E-35	1.44E-33
E-F	0.6	1.4	1.0	1.1	1.35E-32	1.47E-35	1.49E-33
SSOD				49.2	5.16E-31	5.66E-34	2.08E-32
TOTAL					5.80E-31		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.46E-30	1.78E-35	8.78E-36
D-E	6.56E-31	7.99E-36	3.94E-36
E-F	4.61E-31	5.62E-36	2.77E-36
SSOD	1.65E-29	2.01E-34	9.92E-35
TOTAL	1.91E-29	2.32E-34	1.15E-34

CPC SCREENING | RUTHENIUM-106 RISK CRITERIA : 1.49E-10 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	5.25E-35	YES	2.08E-32	YES
Sub570	2.42E-35	YES	2.51E-33	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: RUTHENIUM-106 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	6.01E-31	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	2.67E-30	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	2.40E-29	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	2.42E-35	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	1.36E-31	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	1.22E-30	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	2.28E-30	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.20E-30	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	9.50E-30	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.13E-29	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.25E-35	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.05E-30	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.46E-30	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.74E-29	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** STRONTIUM-90 +1D | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20:04

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	9.15E-12	4.41E-08	1.70E+05	2.00E-01	1.83E-12
WPA	3.05E-12	1.04E-08	1.20E+05	5.09E-01	1.55E-12
Sub570	5.05E-12	2.85E-08	1.99E+05	6.25E-01	3.16E-12
Sub575	2.29E-12	7.96E-09	1.23E+05	2.11E-01	4.82E-13
Sub580	1.76E-12	2.17E-09	4.34E+04	4.40E-02	7.77E-14
PDAR	1.10E-11	2.21E-07	7.06E+05	9.28E-01	1.02E-11
Sub581	8.54E-12	1.09E-07	4.49E+05	4.17E-01	3.56E-12
Sub582	5.67E-12	5.90E-08	3.68E+05	2.97E-01	1.68E-12

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	9.15E-12	4.41E-08	2.65E-09
WPA & sub570	4.30E-12	3.88E-08	1.30E-09
sub575	2.29E-12	7.96E-09	6.78E-10
Sub 580,PDAR, 581 & 582	8.80E-12	3.90E-07	2.47E-09

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.30E-09	1.30E-09
D-D	4.30E-09	1.30E-09
E-E	8.73E-09	2.45E-09
Max:	8.73E-09	2.45E-09

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.53E-09
Avg. Conc. in GMR (ug/l)	1.61E-10
Max. Conc. in Paddys Run at GMR (ug/l)	7.29E-09
Max. Conc. in GMR (ug/l)	7.66E-10

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.89E-08	2.07E-11	1.44E-09
D-E	7.5	11.3	13.9		8.80E-09	9.64E-12	8.22E-10
E-F	0.6	1.4	1.0	1.1	5.18E-09	5.68E-12	5.76E-10
SSOD				49.2	1.92E-07	2.10E-10	7.72E-09
TOTAL					2.25E-07		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.76E-06	2.15E-11	1.06E-11
D-E	7.95E-07	9.67E-12	4.77E-12
E-F	2.23E-07	2.72E-12	1.34E-12
SSOD	6.68E-06	8.14E-11	4.01E-11
TOTAL	9.46E-06	1.15E-10	5.68E-11

CPC SCREENING | **STRONTIUM-90 +1D RISK CRITERIA :** 9.49E-10 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	9.15E-12	NO	1.47E-09	NO	Sub580	1.76E-12	NO	1.76E-09	NO
WPA	3.05E-12	NO	1.47E-09	NO	PDAR	1.10E-11	NO	7.72E-09	NO
Sub570	5.05E-12	NO	1.47E-09	NO	Sub581	8.54E-12	NO	7.72E-09	NO
Sub575	2.29E-12	NO	1.47E-09	NO	Sub582	5.67E-12	NO	5.67E-09	NO

DRAFT

CHEMICAL: STRONTIUM-90 +1D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.65E-09	8.65E-10	1.57E-09	6.78E-10
Single storm adsorbed contaminant quantity PXi (g):	2.48E-08	3.64E-09	6.97E-09	1.50E-09
Annual adsorbed contaminant quantity (g):	1.07E-06	2.76E-08	6.26E-08	2.51E-08
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	9.15E-12	3.05E-12	5.05E-12	2.29E-12
Single storm dissolved contaminant quantity PQi (g):	4.41E-08	1.04E-08	2.85E-08	7.96E-09
Annual dis. conta. qt (based on sediment yield)(g):	1.91E-06	7.86E-08	2.56E-07	1.33E-07
Annual dis. conta. qt (based on runoff) (g):	7.19E-07	1.73E-07	4.77E-07	1.33E-07

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.59E-10	3.15E-09	2.33E-09	1.56E-09
Single storm adsorbed contaminant quantity PXi (g):	2.85E-09	2.49E-08	2.02E-07	1.50E-08
Annual adsorbed contaminant quantity (g):	4.44E-08	8.22E-08	3.36E-06	3.86E-07
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.76E-12	1.10E-11	8.54E-12	5.67E-12
Single storm dissolved contaminant quantity PQi (g):	2.17E-09	2.21E-07	1.09E-07	5.90E-08
Annual dis. conta. qt (based on sediment yield)(g):	3.38E-08	7.27E-07	1.81E-06	1.52E-06
Annual dis. conta. qt (based on runoff) (g):	3.56E-08	3.66E-06	1.81E-06	1.01E-06

DRAFT

PADDYS RUN BASIN | CHEMICAL: TECHNETIUM-99 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 20 06

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.25E-05	6.00E-02	1.70E+05	2.00E-01	2.49E-06
WPA	1.66E-05	5.64E-02	1.20E+05	5.09E-01	8.45E-06
Sub570	5.94E-05	3.35E-01	1.99E+05	6.25E-01	3.71E-05
Sub575	1.72E-04	6.00E-01	1.23E+05	2.11E-01	3.64E-05
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.65E-04	3.31E+00	7.06E+05	9.28E-01	1.53E-04
Sub581	4.53E-05	5.76E-01	4.49E+05	4.17E-01	1.89E-05
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.25E-05	6.00E-02	4.26E-05
WPA & sub570	4.33E-05	3.91E-01	1.57E-04
sub575	1.72E-04	6.00E-01	6.03E-04
Sub 580,PDAR, 581 & 582	8.75E-05	3.88E+00	2.93E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.33E-02	1.57E-04
D-D	5.39E-02	1.91E-04
E-E	8.70E-02	2.91E-04
Max:	8.70E-02	2.91E-04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.57E-02
Avg. Conc. in GMR (ug/l)	1.65E-03
Max. Conc. in Paddys Run at GMR (ug/l)	7.27E-02
Max. Conc. in GMR (ug/l)	7.63E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.11E-01	1.21E-04	8.45E-03
D-E	7.5	11.3	13.9		1.32E-01	1.45E-04	1.23E-02
E-F	0.6	1.4	1.0	1.1	5.45E-02	5.98E-05	6.06E-03
SSOD				49.2	1.91E+00	2.09E-03	7.67E-02
TOTAL					2.21E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.03E+00	7.34E-05	3.62E-05
D-E	1.14E+01	1.39E-04	6.86E-05
E-F	2.32E+00	2.83E-05	1.39E-05
SSOD	6.11E+01	7.44E-04	3.67E-04
TOTAL	8.09E+01	9.85E-04	4.86E-04

CPC SCREENING | TECHNETIUM-99 RISK CRITERIA : 2.18E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.25E-05	NO	1.25E-02	NO	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	1.66E-05	NO	1.49E-02	NO	PDAR	1.65E-04	NO	7.68E-02	NO
Sub570	5.94E-05	NO	1.49E-02	NO	Sub581	4.53E-05	NO	4.53E-02	NO
Sub575	1.72E-04	NO	1.49E-02	NO	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: TECHNETIUM-99 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.26E-05	5.56E-05	2.17E-04	6.03E-04
Single storm adsorbed contaminant quantity PXi (g):	3.99E-04	2.34E-04	9.66E-04	1.34E-03
Annual adsorbed contaminant quantity (g):	1.73E-02	1.78E-03	8.68E-03	2.24E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.25E-05	1.66E-05	5.94E-05	1.72E-04
Single storm dissolved contaminant quantity PQi (g):	6.00E-02	5.64E-02	3.35E-01	6.00E-01
Annual dis. conta. qt (based on sediment yield)(g):	2.60E+00	4.28E-01	3.00E+00	1.00E+01
Annual dis. conta. qt (based on runoff) (g):	9.80E-01	9.41E-01	5.61E+00	1.00E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.57E-04	1.46E-04	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.41E-03	1.26E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.45E-02	2.10E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.65E-04	4.53E-05	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.31E+00	5.76E-01	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.09E+01	9.58E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.48E+01	9.58E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: THORIUM-230 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: Investigator. DCW Date. 5/23/94 20:08

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.84E-09	2.33E-05	1.70E+05	2.00E-01	9.68E-10
WPA	1.34E-09	4.54E-06	1.20E+05	5.09E-01	6.80E-10
Sub570	1.31E-08	7.35E-05	1.99E+05	6.25E-01	8.16E-09
Sub575	3.17E-09	1.11E-05	1.23E+05	2.11E-01	6.70E-10
Sub580	3.17E-10	3.89E-07	4.34E+04	4.40E-02	1.39E-11
PDAR	8.87E-08	1.77E-03	7.06E+05	9.28E-01	8.23E-08
Sub581	5.04E-09	6.41E-05	4.49E+05	4.17E-01	2.10E-09
Sub582	9.34E-10	9.74E-06	3.68E+05	2.97E-01	2.78E-10

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.84E-09	2.33E-05	8.13E-04
WPA & sub570	8.64E-09	7.81E-05	1.55E-03
sub575	3.17E-09	1.11E-05	5.46E-04
Sub 580,PDAR, 581 & 582	4.17E-08	1.85E-03	6.88E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.64E-06	1.55E-03
D-D	8.64E-06	1.55E-03
E-E	4.12E-05	6.80E-03
Max:	4.12E-05	6.80E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.24E-06
Avg. Conc. in GMR (ug/l)	6.55E-07
Max. Conc. in Paddys Run at GMR (ug/l)	3.44E-05
Max. Conc. in GMR (ug/l)	3.61E-06

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.45E-05	2.68E-08	1.87E-06
D-E	7.5	11.3	13.9		1.21E-05	1.33E-08	1.13E-06
E-F	0.6	1.4	1.0	1.1	2.17E-05	2.37E-08	2.41E-06
SSOD				49.2	9.09E-04	9.96E-07	3.65E-05
TOTAL					9.67E-04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.55E-03	1.89E-08	9.30E-09
D-E	7.98E-04	9.72E-09	4.79E-09
E-F	7.37E-04	8.98E-09	4.43E-09
SSOD	2.92E-02	3.55E-07	1.75E-07
TOTAL	3.22E-02	3.93E-07	1.94E-07

CPC SCREENING — THORIUM-230 RISK CRITERIA : 1.80E-05 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.84E-09	YES	1.92E-06	YES	Sub580	3.17E-10	YES	3.17E-07	YES
WPA	1.34E-09	YES	1.34E-06	YES	PDAR	8.87E-08	NO	3.65E-05	NO
Sub570	1.31E-08	YES	1.92E-06	YES	Sub581	5.04E-09	YES	5.04E-06	YES
Sub575	3.17E-09	YES	1.92E-06	YES	Sub582	9.34E-10	YES	9.34E-07	YES

DRAFT

CHEMICAL: THORIUM-230 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.13E-04	2.20E-04	2.35E-03	5.46E-04
Single storm adsorbed contaminant quantity PXi (g):	7.61E-03	9.26E-04	1.04E-02	1.21E-03
Annual adsorbed contaminant quantity (g):	3.29E-01	7.03E-03	9.38E-02	2.02E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.84E-09	1.34E-09	1.31E-08	3.17E-09
Single storm dissolved contaminant quantity PQi (g):	2.33E-05	4.54E-06	7.35E-05	1.11E-05
Annual dis. conta. qt (based on sediment yield)(g):	1.01E-03	3.45E-05	6.60E-04	1.85E-04
Annual dis. conta. qt (based on runoff) (g):	3.80E-04	7.58E-05	1.23E-03	1.85E-04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.82E-05	1.47E-02	7.96E-04	1.50E-04
Single storm adsorbed contaminant quantity PXi (g):	2.97E-04	1.16E-01	6.92E-02	1.43E-03
Annual adsorbed contaminant quantity (g):	4.62E-03	3.83E-01	1.15E+00	3.70E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.17E-10	8.87E-08	5.04E-09	9.34E-10
Single storm dissolved contaminant quantity PQi (g):	3.89E-07	1.77E-03	6.41E-05	9.74E-06
Annual dis. conta. qt (based on sediment yield)(g):	6.06E-06	5.84E-03	1.07E-03	2.52E-04
Annual dis. conta. qt (based on runoff) (g):	6.39E-06	2.94E-02	1.07E-03	1.67E-04

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** THORIUM-232 + 10D | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator. DCW Date. 5/23/94 20:10

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.15E-05	3.44E-01	1.70E+05	2.00E-01	1.43E-05
WPA	9.22E-05	3.13E-01	1.20E+05	5.09E-01	4.69E-05
Sub570	2.53E-04	1.43E+00	1.99E+05	6.25E-01	1.58E-04
Sub575	4.44E-05	1.55E-01	1.23E+05	2.11E-01	9.37E-06
Sub580	3.96E-05	4.86E-02	4.34E+04	4.40E-02	1.74E-06
PDAR	1.16E-03	2.31E+01	7.06E+05	9.28E-01	1.07E-03
Sub581	1.65E-04	2.10E+00	4.49E+05	4.17E-01	6.88E-05
Sub582	6.61E-05	6.89E-01	3.68E+05	2.97E-01	1.96E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	7.15E-05	3.44E-01	1.20E+01
WPA & sub570	1.93E-04	1.74E+00	3.42E+01
sub575	4.44E-05	1.55E-01	7.64E+00
Sub 580,PDAR, 581 & 582	5.85E-04	2.60E+01	9.65E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.93E-01	3.42E+01
D-D	1.93E-01	3.42E+01
E-E	5.80E-01	9.55E+01
Max:	5.80E-01	9.55E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	8.97E-02
Avg. Conc. in GMR (ug/l)	9.42E-03
Max. Conc. in Paddys Run at GMR (ug/l)	4.84E-01
Max. Conc. in GMR (ug/l)	5.08E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.10E-01	5.58E-04	3.88E-02
D-E	7.5	11.3	13.9		2.44E-01	2.67E-04	2.28E-02
E-F	0.6	1.4	1.0	1.1	3.14E-01	3.44E-04	3.48E-02
SSOD				49.2	1.28E+01	1.40E-02	5.13E-01
TOTAL					1.38E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.92E+01	3.55E-04	1.75E-04
D-E	1.45E+01	1.76E-04	8.70E-05
E-F	1.09E+01	1.33E-04	6.56E-05
SSOD	4.15E+02	5.05E-03	2.49E-03
TOTAL	4.69E+02	5.72E-03	2.82E-03

CPC SCREENING | **THORIUM-232 + 10D RISK CRITERIA :** 2.55E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.15E-05	YES	3.91E-02	YES	Sub580	3.96E-05	YES	3.96E-02	YES
WPA	9.22E-05	YES	3.91E-02	YES	PDAR	1.16E-03	NO	5.14E-01	NO
Sub570	2.53E-04	YES	3.91E-02	YES	Sub581	1.65E-04	YES	1.65E-01	YES
Sub575	4.44E-05	YES	3.91E-02	YES	Sub582	6.61E-05	YES	6.61E-02	YES

DRAFT

CHEMICAL: THORIUM-232 + 10D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.20E+01	1.52E+01	4.56E+01	7.64E+00
Single storm adsorbed contaminant quantity PXi (g):	1.12E+02	6.39E+01	2.03E+02	1.69E+01
Annual adsorbed contaminant quantity (g):	4.87E+03	4.85E+02	1.82E+03	2.83E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.15E-05	9.22E-05	2.53E-04	4.44E-05
Single storm dissolved contaminant quantity PQi (g):	3.44E-01	3.13E-01	1.43E+00	1.55E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.49E+01	2.38E+00	1.28E+01	2.59E+00
Annual dis. conta. qt (based on runoff) (g):	5.62E+00	5.22E+00	2.39E+01	2.59E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.27E+00	1.92E+02	2.60E+01	1.06E+01
Single storm adsorbed contaminant quantity PXi (g):	3.71E+01	1.52E+03	2.26E+03	1.01E+02
Annual adsorbed contaminant quantity (g):	5.77E+02	5.00E+03	3.76E+04	2.61E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.96E-05	1.16E-03	1.65E-04	6.61E-05
Single storm dissolved contaminant quantity PQi (g):	4.86E-02	2.31E+01	2.10E+00	6.89E-01
Annual dis. conta. qt (based on sediment yield)(g):	7.57E-01	7.62E+01	3.49E+01	1.78E+01
Annual dis. conta. qt (based on runoff) (g):	7.99E-01	3.84E+02	3.49E+01	1.18E+01

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** URANIUM (Total) | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/25/94 10:04

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.46E-02	2.15E+02	1.70E+05	2.00E-01	8.92E-03
WPA	2.42E-02	8.23E+01	1.20E+05	5.09E-01	1.23E-02
Sub570	8.01E-02	4.52E+02	1.99E+05	6.25E-01	5.01E-02
Sub575	3.47E-03	1.21E+01	1.23E+05	2.11E-01	7.32E-04
Sub580	2.66E-03	3.27E+00	4.34E+04	4.40E-02	1.17E-04
PDAR	4.32E+00	8.63E+04	7.06E+05	9.28E-01	4.01E+00
Sub581	2.25E-01	2.85E+03	4.49E+05	4.17E-01	9.36E-02
Sub582	2.58E-03	2.69E+01	3.68E+05	2.97E-01	7.68E-04

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.46E-02	2.15E+02	8.51E+01
WPA & sub570	5.91E-02	5.34E+02	4.02E+02
sub575	3.47E-03	1.21E+01	2.28E+01
Sub 580,PDAR, 581 & 582	2.01E+00	8.92E+04	1.59E+03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.91E+01	4.02E+02
D-D	5.91E+01	4.02E+02
E-E	1.98E+03	1.57E+03
Max:	1.98E+03	1.57E+03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.86E+02
Avg. Conc. in GMR (ug/l)	3.01E+01
Max. Conc. in Paddys Run at GMR (ug/l)	1.66E+03
Max. Conc. in GMR (ug/l)	1.74E+02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.79E+02	1.96E-01	1.36E+01
D-E	7.5	11.3	13.9		7.81E+01	8.56E-02	7.30E+00
E-F	0.6	1.4	1.0	1.1	9.90E+02	1.09E+00	1.10E+02
SSOD				49.2	4.39E+04	4.81E+01	1.76E+03
TOTAL					4.51E+04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.23E+04	1.50E-01	7.38E-02
D-E	5.13E+03	6.25E-02	3.08E-02
E-F	3.20E+04	3.89E-01	1.92E-01
SSOD	1.40E+06	1.71E+01	8.43E+00
TOTAL	1.45E+06	1.77E+01	8.73E+00

CPC SCREENING URANIUM (Total) RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.46E-02	NO	1.32E+01	NO	Sub580	2.66E-03	YES	2.66E+00	YES
WPA	2.42E-02	NO	1.32E+01	NO	PDAR	4.32E+00	NO	1.76E+03	NO
Sub570	8.01E-02	NO	1.32E+01	NO	Sub581	2.25E-01	NO	2.25E+02	NO
Sub575	3.47E-03	YES	3.47E+00	YES	Sub582	2.58E-03	YES	2.58E+00	YES

DRAFT

CHEMICAL: URANIUM (Total) Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.51E+01	1.52E+02	5.52E+02	2.28E+01
Single storm adsorbed contaminant quantity PXi (g):	7.97E+02	6.42E+02	2.45E+03	5.07E+01
Annual adsorbed contaminant quantity (g):	3.45E+04	4.87E+03	2.20E+04	8.47E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.46E-02	2.42E-02	8.01E-02	3.47E-03
Single storm dissolved contaminant quantity PQi (g):	2.15E+02	8.23E+01	4.52E+02	1.21E+01
Annual dis. conta. qt (based on sediment yield)(g):	9.29E+03	6.24E+02	4.06E+03	2.02E+02
Annual dis. conta. qt (based on runoff) (g):	3.51E+03	1.37E+03	7.57E+03	2.02E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.87E+01	3.38E+03	2.22E+02	1.58E+01
Single storm adsorbed contaminant quantity PXi (g):	9.52E+01	2.68E+04	1.93E+04	1.52E+02
Annual adsorbed contaminant quantity (g):	1.48E+03	8.82E+04	3.22E+05	3.91E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.66E-03	4.32E+00	2.25E-01	2.58E-03
Single storm dissolved contaminant quantity PQi (g):	3.27E+00	8.63E+04	2.85E+03	2.69E+01
Annual dis. conta. qt (based on sediment yield)(g):	5.08E+01	2.84E+05	4.75E+04	6.96E+02
Annual dis. conta. qt (based on runoff) (g):	5.36E+01	1.43E+06	4.75E+04	4.61E+02

DRAFT

PADDYS RUN BASIN **CHEMICAL:** **URANIUM-234** **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/25/94 9:58

Subbasin	Ce Dissolved Conc. (mg/l)	PCi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.39E-06	6.71E-03	1.70E+05	2.00E-01	2.79E-07
WPA	1.97E-07	6.68E-04	1.20E+05	5.09E-01	1.00E-07
Sub570	1.07E-06	6.02E-03	1.99E+05	6.25E-01	6.68E-07
Sub575	3.84E-07	1.34E-03	1.23E+05	2.11E-01	8.10E-08
Sub580	2.97E-08	3.65E-05	4.34E+04	4.40E-02	1.31E-09
PDAR	2.98E-04	5.95E+00	7.06E+05	9.28E-01	2.76E-04
Sub581	7.61E-06	9.67E-02	4.49E+05	4.17E-01	3.17E-06
Sub582	1.29E-07	1.34E-03	3.68E+05	2.97E-01	3.83E-08

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.39E-06	6.71E-03	2.00E-03
WPA & sub570	7.40E-07	6.69E-03	5.06E-03
sub575	3.84E-07	1.34E-03	2.53E-03
Sub 580,PDAR, 581 & 582	1.36E-04	6.05E+00	9.36E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	7.40E-04	5.06E-03
D-D	7.40E-04	5.06E-03
E-E	1.34E-01	9.22E-02
Max:	1.34E-01	9.22E-02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.93E-02
Avg. Conc. in GMR (ug/l)	2.02E-03
Max. Conc. in Paddys Run at GMR (ug/l)	1.12E-01
Max. Conc. in GMR (ug/l)	1.18E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.07E-03	3.36E-06	2.34E-04
D-E	7.5	11.3	13.9		1.44E-03	1.58E-06	1.35E-04
E-F	0.6	1.4	1.0	1.1	6.67E-02	7.30E-05	7.40E-03
SSOD				49.2	2.97E+00	3.26E-03	1.20E-01
TOTAL					3.05E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.77E-01	3.37E-06	1.66E-06
D-E	1.27E-01	1.54E-06	7.60E-07
E-F	2.14E+00	2.60E-05	1.28E-05
SSOD	9.51E+01	1.16E-03	5.71E-04
TOTAL	9.77E+01	1.19E-03	5.86E-04

CPC SCREENING URANIUM-234 RISK CRITERIA : 4.82E-05 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.39E-06	NO	2.40E-04	NO	Sub580	2.97E-08	YES	2.97E-05	YES
WPA	1.97E-07	NO	1.97E-04	NO	PDAR	2.98E-04	NO	1.20E-01	NO
Sub570	1.07E-06	NO	2.40E-04	NO	Sub581	7.61E-06	NO	7.61E-03	NO
Sub575	3.84E-07	NO	2.40E-04	NO	Sub582	1.29E-07	NO	1.29E-04	NO

DRAFT

CHEMICAL: URANIUM-234 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.00E-03	1.24E-03	7.36E-03	2.53E-03
Single storm adsorbed contaminant quantity PXi (g):	1.87E-02	5.22E-03	3.27E-02	5.61E-03
Annual adsorbed contaminant quantity (g):	8.12E-01	3.96E-02	2.94E-01	9.37E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.39E-06	1.97E-07	1.07E-06	3.84E-07
Single storm dissolved contaminant quantity PQi (g):	6.71E-03	6.68E-04	6.02E-03	1.34E-03
Annual dis. conta. qt (based on sediment yield)(g):	2.90E-01	5.07E-03	5.41E-02	2.24E-02
Annual dis. conta. qt (based on runoff) (g):	1.10E-01	1.11E-02	1.01E-01	2.24E-02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.09E-04	2.03E-01	6.78E-03	7.90E-04
Single storm adsorbed contaminant quantity PXi (g):	1.06E-03	1.61E+00	5.90E-01	7.56E-03
Annual adsorbed contaminant quantity (g):	1.66E-02	5.30E+00	9.81E+00	1.95E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.97E-08	2.98E-04	7.61E-06	1.29E-07
Single storm dissolved contaminant quantity PQi (g):	3.65E-05	5.95E+00	9.67E-02	1.34E-03
Annual dis. conta. qt (based on sediment yield)(g):	5.68E-04	1.96E+01	1.61E+00	3.47E-02
Annual dis. conta. qt (based on runoff) (g):	5.99E-04	9.86E+01	1.61E+00	2.30E-02

DRAFT

PADDYS RUN BASIN | CHEMICAL: URANIUM-235/236 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date 5/25/94 10:00

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.98E-04	1.44E+00	1.70E+05	2.00E-01	5.96E-05
WPA	1.90E-04	6.47E-01	1.20E+05	5.09E-01	9.69E-05
Sub570	3.27E-04	1.84E+00	1.99E+05	6.25E-01	2.05E-04
Sub575	1.23E-04	4.29E-01	1.23E+05	2.11E-01	2.60E-05
Sub580	5.97E-06	7.33E-03	4.34E+04	4.40E-02	2.63E-07
PDAR	5.22E-02	1.04E+03	7.06E+05	9.28E-01	4.84E-02
Sub581	2.05E-03	2.61E+01	4.49E+05	4.17E-01	8.55E-04
Sub582	1.40E-05	1.46E-01	3.68E+05	2.97E-01	4.17E-06

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.98E-04	1.44E+00	5.61E-01
WPA & sub570	2.76E-04	2.49E+00	1.86E+00
sub575	1.23E-04	4.29E-01	8.12E-01
Sub 580,PDAR, 581 & 582	2.41E-02	1.07E+03	1.78E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.76E-01	1.86E+00
D-D	2.76E-01	1.86E+00
E-E	2.37E+01	1.76E+01
Max:	2.37E+01	1.76E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.41E+00
Avg. Conc. in GMR (ug/l)	3.59E-01
Max. Conc. in Paddys Run at GMR (ug/l)	1.98E+01
Max. Conc. in GMR (ug/l)	2.08E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.24E-01	1.01E-03	7.04E-02
D-E	7.5	11.3	13.9		4.49E-01	4.92E-04	4.19E-02
E-F	0.6	1.4	1.0	1.1	1.18E+01	1.29E-02	1.31E+00
SSOD				49.2	5.26E+02	5.76E-01	2.11E+01
TOTAL					5.39E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.06E+01	8.59E-04	4.24E-04
D-E	3.43E+01	4.18E-04	2.06E-04
E-F	3.79E+02	4.62E-03	2.28E-03
SSOD	1.68E+04	2.05E-01	1.01E-01
TOTAL	1.73E+04	2.11E-01	1.04E-01

CPC SCREENING | URANIUM-235/236 RISK CRITERIA : 1.39E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.98E-04	NO	7.25E-02	YES	Sub580	5.97E-06	YES	5.97E-03	YES
WPA	1.90E-04	NO	7.25E-02	YES	PDAR	5.22E-02	NO	2.11E+01	NO
Sub570	3.27E-04	NO	7.25E-02	YES	Sub581	2.05E-03	NO	2.05E+00	NO
Sub575	1.23E-04	YES	7.25E-02	YES	Sub582	1.40E-05	YES	1.40E-02	YES

DRAFT

CHEMICAL: URANIUM-235/236 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.61E-01	1.20E+00	2.26E+00	8.12E-01
Single storm adsorbed contaminant quantity PXi (g):	5.25E+00	5.05E+00	1.00E+01	1.80E+00
Annual adsorbed contaminant quantity (g):	2.27E+02	3.83E+01	9.00E+01	3.01E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.98E-04	1.90E-04	3.27E-04	1.23E-04
Single storm dissolved contaminant quantity PQi (g):	1.44E+00	6.47E-01	1.84E+00	4.29E-01
Annual dis. conta. qt (based on sediment yield)(g):	6.21E+01	4.91E+00	1.66E+01	7.18E+00
Annual dis. conta. qt (based on runoff) (g):	2.34E+01	1.08E+01	3.09E+01	7.18E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.20E-02	3.80E+01	2.34E+00	8.61E-02
Single storm adsorbed contaminant quantity PXi (g):	2.14E-01	3.01E+02	2.03E+02	8.23E-01
Annual adsorbed contaminant quantity (g):	3.33E+00	9.92E+02	3.38E+03	2.13E+01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.97E-06	5.22E-02	2.05E-03	1.40E-05
Single storm dissolved contaminant quantity PQi (g):	7.33E-03	1.04E+03	2.61E+01	1.46E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.14E-01	3.44E+03	4.34E+02	3.78E+00
Annual dis. conta. qt (based on runoff) (g):	1.20E-01	1.73E+04	4.34E+02	2.51E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: URANIUM-238 + 2D | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/25/94 10:02

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.05E-02	2.91E+02	1.70E+05	2.00E-01	1.21E-02
WPA	6.54E-02	2.22E+02	1.20E+05	5.09E-01	3.33E-02
Sub570	9.25E-02	5.21E+02	1.99E+05	6.25E-01	5.78E-02
Sub575	3.31E-03	1.15E+01	1.23E+05	2.11E-01	6.99E-04
Sub580	7.61E-04	9.35E-01	4.34E+04	4.40E-02	3.35E-05
PDAR	6.44E+00	1.29E+05	7.06E+05	9.28E-01	5.97E+00
Sub581	1.47E-01	1.87E+03	4.49E+05	4.17E-01	6.13E-02
Sub582	3.27E-03	3.41E+01	3.68E+05	2.97E-01	9.72E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.05E-02	2.91E+02	1.91E+02
WPA & sub570	8.23E-02	7.43E+02	5.53E+02
sub575	3.31E-03	1.15E+01	2.18E+01
Sub 580,PDAR, 581 & 582	2.94E+00	1.31E+05	2.00E+03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.23E+01	5.53E+02
D-D	8.23E+01	5.53E+02
E-E	2.90E+03	1.98E+03
Max:	2.90E+03	1.98E+03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.19E+02
Avg. Conc. in GMR (ug/l)	4.40E+01
Max. Conc. in Paddys Run at GMR (ug/l)	2.42E+03
Max. Conc. in GMR (ug/l)	2.54E+02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub580	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.47E+02	2.71E-01	1.88E+01
D-E	7.5	11.3	13.9		1.07E+02	1.18E-01	1.00E+01
E-F	0.6	1.4	1.0	1.1	1.45E+03	1.59E+00	1.61E+02
SSOD				49.2	6.42E+04	7.04E+01	2.58E+03
TOTAL					6.61E+04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.69E+04	2.05E-01	1.01E-01
D-E	6.98E+03	8.50E-02	4.19E-02
E-F	4.67E+04	5.69E-01	2.80E-01
SSOD	2.05E+06	2.50E+01	1.23E+01
TOTAL	2.13E+06	2.59E+01	1.28E+01

CPC SCREENING | URANIUM-238 + 2D RISK CRITERIA : 5.06E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.05E-02	NO	1.82E+01	NO	Sub580	7.61E-04	NO	7.61E-01	NO
WPA	6.54E-02	NO	1.82E+01	NO	PDAR	6.44E+00	NO	2.58E+03	NO
Sub570	9.25E-02	NO	1.82E+01	NO	Sub581	1.47E-01	NO	1.47E+02	NO
Sub575	3.31E-03	NO	3.31E+00	NO	Sub582	3.27E-03	NO	3.27E+00	NO

DRAFT

CHEMICAL: URANIUM-238 + 2D Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.91E+02	4.12E+02	6.37E+02	2.18E+01
Single storm adsorbed contaminant quantity PXi (g):	1.79E+03	1.73E+03	2.83E+03	4.84E+01
Annual adsorbed contaminant quantity (g):	7.73E+04	1.32E+04	2.54E+04	8.09E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.05E-02	6.54E-02	9.25E-02	3.31E-03
Single storm dissolved contaminant quantity PQi (g):	2.91E+02	2.22E+02	5.21E+02	1.15E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.26E+04	1.69E+03	4.68E+03	1.93E+02
Annual dis. conta. qt (based on runoff) (g):	4.76E+03	3.70E+03	8.74E+03	1.93E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.35E+00	4.28E+03	2.29E+02	2.01E+01
Single storm adsorbed contaminant quantity PXi (g):	2.73E+01	3.39E+04	1.99E+04	1.92E+02
Annual adsorbed contaminant quantity (g):	4.25E+02	1.12E+05	3.31E+05	4.96E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.61E-04	6.44E+00	1.47E-01	3.27E-03
Single storm dissolved contaminant quantity PQi (g):	9.35E-01	1.29E+05	1.87E+03	3.41E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.46E+01	4.24E+05	3.11E+04	8.81E+02
Annual dis. conta. qt (based on runoff) (g):	1.54E+01	2.13E+06	3.11E+04	5.84E+02

DRAFT

PADDYS RUN BASIN | CHEMICAL: ALUMINUM | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator. DCW | Date. 5/23/94 19.21

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.36E-01	1.14E+03	1.70E+05	2.00E-01	4.72E-02
WPA	2.10E-01	7.13E+02	1.20E+05	5.09E-01	1.07E-01
Sub570	2.47E-01	1.39E+03	1.99E+05	6.25E-01	1.55E-01
Sub575	2.36E-01	8.22E+02	1.23E+05	2.11E-01	4.98E-02
Sub580	1.82E-01	2.24E+02	4.34E+04	4.40E-02	8.03E-03
PDAR	2.82E-01	5.63E+03	7.06E+05	9.28E-01	2.61E-01
Sub581	2.52E-01	3.20E+03	4.49E+05	4.17E-01	1.05E-01
Sub582	2.38E-01	2.48E+03	3.68E+05	2.97E-01	7.07E-02

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.36E-01	1.14E+03	1.03E+04
WPA & sub570	2.33E-01	2.11E+03	1.05E+04
sub575	2.36E-01	8.22E+02	1.05E+04
Sub 580,PDAR, 581 & 582	2.60E-01	1.15E+04	1.09E+04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.33E+02	1.05E+04
D-D	2.33E+02	1.05E+04
E-E	2.60E+02	1.09E+04
Max:	2.60E+02	1.09E+04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.96E+01
Avg. Conc. in GMR (ug/l)	5.21E+00
Max. Conc. in Paddys Run at GMR (ug/l)	2.17E+02
Max. Conc. in GMR (ug/l)	2.28E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.65E+02	8.38E-01	5.83E+01
D-E	7.5	11.3	13.9		4.37E+02	4.79E-01	4.09E+01
E-F	0.6	1.4	1.0	1.1	1.71E+02	1.88E-01	1.90E+01
SSOD				49.2	5.67E+03	6.22E+00	2.28E+02
TOTAL					7.05E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.73E+04	6.98E-01	3.44E-01
D-E	3.49E+04	4.25E-01	2.10E-01
E-F	7.87E+03	9.58E-02	4.73E-02
SSOD	2.04E+05	2.48E+00	1.22E+00
TOTAL	3.04E+05	3.70E+00	1.83E+00

CPC SCREENING | ALUMINUM RISK CRITERIA : 1.10E+04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.36E-01	YES	6.53E+01	YES	Sub580	1.82E-01	YES	1.82E+02	YES
WPA	2.10E-01	YES	6.53E+01	YES	PDAR	2.82E-01	YES	2.28E+02	YES
Sub570	2.47E-01	YES	6.53E+01	YES	Sub581	2.52E-01	YES	2.28E+02	YES
Sub575	2.36E-01	YES	6.53E+01	YES	Sub582	2.38E-01	YES	2.28E+02	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** ANTIMONY | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 19.22

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	9.97E-04	4.80E+00	1.70E+05	2.00E-01	1.99E-04
WPA	1.91E-03	6.49E+00	1.20E+05	5.09E-01	9.72E-04
Sub570	1.25E-03	7.02E+00	1.99E+05	6.25E-01	7.79E-04
Sub575	1.02E-04	3.57E-01	1.23E+05	2.11E-01	2.16E-05
Sub580	9.59E-05	1.18E-01	4.34E+04	4.40E-02	4.22E-06
PDAR	6.78E-04	1.36E+01	7.06E+05	9.28E-01	6.29E-04
Sub581	1.12E-03	1.43E+01	4.49E+05	4.17E-01	4.69E-04
Sub582	1.10E-04	1.15E+00	3.68E+05	2.97E-01	3.27E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	9.97E-04	4.80E+00	7.22E+00
WPA & sub570	1.50E-03	1.35E+01	1.11E+01
sub575	1.02E-04	3.57E-01	7.60E-01
Sub 580,PDAR, 581 & 582	6.56E-04	2.91E+01	4.57E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.50E+00	1.11E+01
D-D	1.50E+00	1.11E+01
E-E	1.50E+00	1.11E+01
Max:	1.50E+00	1.11E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.52E-01
Avg. Conc. in GMR (ug/l)	1.60E-02
Max. Conc. in Paddys Run at GMR (ug/l)	1.25E+00
Max. Conc. in GMR (ug/l)	1.31E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cpma per cell (ug/l)
C-D	20.6	25.2			4.39E+00	4.81E-03	3.35E-0
D-E	7.5	11.3	13.9		1.94E+00	2.12E-03	1.81E-01
E-F	0.6	1.4	1.0	1.1	5.42E-01	5.94E-04	6.02E-02
SSOD				49.2	1.43E+01	1.57E-02	5.76E-01
TOTAL					2.12E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.91E+02	3.55E-03	1.75E-03
D-E	1.23E+02	1.50E-03	7.41E-04
E-F	2.43E+01	2.95E-04	1.46E-04
SSOD	4.69E+02	5.71E-03	2.82E-03
TOTAL	9.08E+02	1.11E-02	5.45E-03

CPC SCREENING | **ANTIMONY RISK CRITERIA :** 1.50E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	9.97E-04	YES	3.26E-01	YES	Sub580	9.59E-05	YES	9.59E-02	YES
WPA	1.91E-03	NO	3.26E-01	YES	PDAR	6.78E-04	YES	5.76E-01	YES
Sub570	1.25E-03	YES	3.26E-01	YES	Sub581	1.12E-03	YES	5.76E-01	YES
Sub575	1.02E-04	YES	1.02E-01	YES	Sub582	1.10E-04	YES	1.10E-01	YES

PADDYS RUN BASIN | CHEMICAL: ARSENIC | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator. DCW | Date 5/23/94 19:24

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.96E-03	9.41E+00	1.70E+05	2.00E-01	3.91E-04
WPA	1.07E-03	3.65E+00	1.20E+05	5.09E-01	5.46E-04
Sub570	3.91E-03	2.21E+01	1.99E+05	6.25E-01	2.45E-03
Sub575	1.14E-03	3.97E+00	1.23E+05	2.11E-01	2.41E-04
Sub580	1.02E-03	1.26E+00	4.34E+04	4.40E-02	4.51E-05
PDAR	1.76E-03	3.52E+01	7.06E+05	9.28E-01	1.64E-03
Sub581	1.58E-03	2.01E+01	4.49E+05	4.17E-01	6.58E-04
Sub582	1.59E-03	1.65E+01	3.68E+05	2.97E-01	4.71E-04

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.96E-03	9.41E+00	1.13E+01
WPA & sub570	2.85E-03	2.57E+01	1.75E+01
sub575	1.14E-03	3.97E+00	6.77E+00
Sub 580,PDAR, 581 & 582	1.65E-03	7.31E+01	9.23E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.85E+00	1.75E+01
D-D	2.85E+00	1.75E+01
E-E	2.85E+00	1.75E+01
Max:	2.85E+00	1.75E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.57E-01
Avg. Conc. in GMR (ug/l)	3.75E-02
Max. Conc. in Paddys Run at GMR (ug/l)	2.38E+00
Max. Conc. in GMR (ug/l)	2.50E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			8.42E+00	9.22E-03	6.41E-01
D-E	7.5	11.3	13.9		4.16E+00	4.56E-03	3.89E-01
E-F	0.6	1.4	1.0	1.1	1.26E+00	1.38E-03	1.40E-01
SSOD				49.2	3.59E+01	3.94E-02	1.44E+00
TOTAL					4.98E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.63E+02	6.86E-03	3.38E-03
D-E	2.87E+02	3.50E-03	1.72E-03
E-F	5.91E+01	7.19E-04	3.55E-04
SSOD	1.30E+03	1.58E-02	7.80E-03
TOTAL	2.21E+03	2.69E-02	1.33E-02

CPC SCREENING | ARSENIC RISK CRITERIA : 4.90E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.96E-03	NO	6.61E-01	NO	Sub580	1.02E-03	NO	1.02E+00	NO
WPA	1.07E-03	NO	6.61E-01	NO	PDAR	1.76E-03	NO	1.44E+00	NO
Sub570	3.91E-03	NO	6.61E-01	NO	Sub581	1.58E-03	NO	1.44E+00	NO
Sub575	1.14E-03	NO	6.61E-01	NO	Sub582	1.59E-03	NO	1.44E+00	NO

DRAFT

PADDYS RUN BASIN | CHEMICAL: BERYLLIUM | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator DCW | Date 5/23/94 19:26

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.89E-05	1.87E-01	1.70E+05	2.00E-01	7.77E-06
WPA	1.77E-05	6.03E-02	1.20E+05	5.09E-01	9.03E-06
Sub570	3.91E-05	2.20E-01	1.99E+05	6.25E-01	2.44E-05
Sub575	3.74E-05	1.30E-01	1.23E+05	2.11E-01	7.90E-06
Sub580	1.46E-05	1.79E-02	4.34E+04	4.40E-02	6.41E-07
PDAR	3.95E-05	7.91E-01	7.06E+05	9.28E-01	3.67E-05
Sub581	3.61E-05	4.59E-01	4.49E+05	4.17E-01	1.51E-05
Sub582	3.91E-05	4.07E-01	3.68E+05	2.97E-01	1.16E-05

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.89E-05	1.87E-01	1.46E+00
WPA & sub570	3.10E-05	2.80E-01	1.23E+00
sub575	3.74E-05	1.30E-01	1.44E+00
Sub 580,PDAR, 581 & 582	3.78E-05	1.67E+00	1.37E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.10E-02	1.23E+00
D-D	3.10E-02	1.23E+00
E-E	3.77E-02	1.37E+00
Max:	3.77E-02	1.37E+00

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.23E-03
Avg. Conc. in GMR (ug/l)	7.59E-04
Max. Conc. in Paddys Run at GMR (ug/l)	3.14E-02
Max. Conc. in GMR (ug/l)	3.30E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.09E-01	1.20E-04	8.32E-[illegible]
D-E	7.5	11.3	13.9		6.38E-02	7.00E-05	5.97E-03
E-F	0.6	1.4	1.0	1.1	2.48E-02	2.71E-05	2.75E-03
SSOD				49.2	8.24E-01	9.03E-04	3.31E-02
TOTAL					1.02E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	8.72E+00	1.06E-04	5.24E-05
D-E	5.36E+00	6.53E-05	3.22E-05
E-F	1.17E+00	1.42E-05	7.01E-06
SSOD	3.00E+01	3.66E-04	1.80E-04
TOTAL	4.53E+01	5.52E-04	2.72E-04

CPC SCREENING | BERYLLIUM RISK CRITERIA : 2.00E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.89E-05	NO	9.47E-03	NO	Sub580	1.46E-05	NO	1.46E-02	NO
WPA	1.77E-05	NO	9.47E-03	NO	PDAR	3.95E-05	NO	3.31E-02	NO
Sub570	3.91E-05	NO	9.47E-03	NO	Sub581	3.61E-05	NO	3.31E-02	NO
Sub575	3.74E-05	NO	9.47E-03	NO	Sub582	3.91E-05	NO	3.31E-02	NO

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** BARIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 19:25

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.90E-03	1.40E+01	1.70E+05	2.00E-01	5.80E-04
WPA	2.04E-03	6.95E+00	1.20E+05	5.09E-01	1.04E-03
Sub570	2.87E-03	1.62E+01	1.99E+05	6.25E-01	1.79E-03
Sub575	3.00E-03	1.04E+01	1.23E+05	2.11E-01	6.33E-04
Sub580	2.12E-03	2.61E+00	4.34E+04	4.40E-02	9.33E-05
PDAR	6.19E-03	1.24E+02	7.06E+05	9.28E-01	5.75E-03
Sub581	3.50E-03	4.45E+01	4.49E+05	4.17E-01	1.46E-03
Sub582	2.39E-03	2.49E+01	3.68E+05	2.97E-01	7.09E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.90E-03	1.40E+01	9.58E+01
WPA & sub570	2.56E-03	2.31E+01	8.82E+01
sub575	3.00E-03	1.04E+01	1.01E+02
Sub 580,PDAR, 581 & 582	4.42E-03	1.96E+02	1.42E+02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.56E+00	8.82E+01
D-D	2.56E+00	8.82E+01
E-E	4.39E+00	1.41E+02
Max:	4.39E+00	1.41E+02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.74E-01
Avg. Conc. in GMR (ug/l)	8.13E-02
Max. Conc. in Paddys Run at GMR (ug/l)	3.66E+00
Max. Conc. in GMR (ug/l)	3.85E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			8.70E+00	9.53E-03	6.63E-01
D-E	7.5	11.3	13.9		5.11E+00	5.60E-03	4.77E-01
E-F	0.6	1.4	1.0	1.1	2.67E+00	2.92E-03	2.96E-01
SSOD				49.2	9.64E+01	1.06E-01	3.87E+00
TOTAL					1.13E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.74E+02	8.21E-03	4.05E-03
D-E	4.21E+02	5.12E-03	2.53E-03
E-F	1.13E+02	1.38E-03	6.79E-04
SSOD	3.31E+03	4.03E-02	1.99E-02
TOTAL	4.52E+03	5.50E-02	2.71E-02

CPC SCREENING **BARIUM RISK CRITERIA :** 2.60E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.90E-03	YES	7.55E-01	YES	Sub580	2.12E-03	YES	2.12E+00	YES
WPA	2.04E-03	YES	7.55E-01	YES	PDAR	6.19E-03	YES	3.87E+00	YES
Sub570	2.87E-03	YES	7.55E-01	YES	Sub581	3.50E-03	YES	3.50E+00	YES
Sub575	3.00E-03	YES	7.55E-01	YES	Sub582	2.39E-03	YES	2.39E+00	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** BORON | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:43

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.55E-01	7.47E+02	1.70E+05	2.00E-01	3.11E-02
WPA	1.53E-01	5.21E+02	1.20E+05	5.09E-01	7.81E-02
Sub570	1.40E-01	7.89E+02	1.99E+05	6.25E-01	8.75E-02
Sub575	1.46E-01	5.10E+02	1.23E+05	2.11E-01	3.09E-02
Sub580	1.37E-01	1.69E+02	4.34E+04	4.40E-02	6.05E-03
PDAR	1.52E-01	3.04E+03	7.06E+05	9.28E-01	1.41E-01
Sub581	1.64E-01	2.09E+03	4.49E+05	4.17E-01	6.86E-02
Sub582	1.64E-01	1.71E+03	3.68E+05	2.97E-01	4.87E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.55E-01	7.47E+02	1.35E+01
WPA & sub570	1.45E-01	1.31E+03	1.30E+01
sub575	1.46E-01	5.10E+02	1.30E+01
Sub 580,PDAR, 581 & 582	1.58E-01	7.01E+03	1.33E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.45E+02	1.30E+01
D-D	1.45E+02	1.30E+01
E-E	1.58E+02	1.33E+01
Max:	1.58E+02	1.33E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.05E+01
Avg. Conc. in GMR (ug/l)	3.20E+00
Max. Conc. in Paddys Run at GMR (ug/l)	1.32E+02
Max. Conc. in GMR (ug/l)	1.38E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.84E+02	5.31E-01	3.69E+0[illegible]
D-E	7.5	11.3	13.9		2.75E+02	3.01E-01	2.57E+01
E-F	0.6	1.4	1.0	1.1	1.05E+02	1.15E-01	1.17E+01
SSOD				49.2	3.45E+03	3.78E+00	1.39E+02
TOTAL					4.31E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.69E+04	4.49E-01	2.21E-01
D-E	2.22E+04	2.70E-01	1.33E-01
E-F	4.91E+03	5.97E-02	2.95E-02
SSOD	1.26E+05	1.53E+00	7.55E-01
TOTAL	1.90E+05	2.31E+00	1.14E+00

CPC SCREENING | **BORON RISK CRITERIA :** 3.30E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.55E-01	YES	4 12E+01	YES	Sub580	1.37E-01	YES	1.37E+02	YES
WPA	1.53E-01	YES	4.12E+01	YES	PDAR	1.52E-01	YES	1.39E+02	YES
Sub570	1.40E-01	YES	4.12E+01	YES	Sub581	1.64E-01	YES	1.39E+02	YES
Sub575	1.46E-01	YES	4.12E+01	YES	Sub582	1.64E-01	YES	1.39E+02	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** CADMIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 19:28

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.92E-04	9.23E-01	1.70E+05	2.00E-01	3.84E-05
WPA	2.04E-04	6.94E-01	1.20E+05	5.09E-01	1.04E-04
Sub570	3.52E-04	1.98E+00	1.99E+05	6.25E-01	2.20E-04
Sub575	3.90E-05	1.36E-01	1.23E+05	2.11E-01	8.23E-06
Sub580	8.20E-05	1.01E-01	4.34E+04	4.40E-02	3.61E-06
PDAR	3.13E-04	6.26E+00	7.06E+05	9.28E-01	2.91E-04
Sub581	5.50E-05	6.99E-01	4.49E+05	4.17E-01	2.29E-05
Sub582	5.44E-05	5.66E-01	3.68E+05	2.97E-01	1.61E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.92E-04	9.23E-01	2.78E+00
WPA & sub570	2.96E-04	2.68E+00	4.50E+00
sub575	3.90E-05	1.36E-01	5.78E-01
Sub 580,PDAR, 581 & 582	1.72E-04	7.63E+00	2.44E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.96E-01	4.50E+00
D-D	2.96E-01	4.50E+00
E-E	2.96E-01	4.50E+00
Max:	2.96E-01	4.50E+00

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.61E-02
Avg. Conc. in GMR (ug/l)	3.80E-03
Max. Conc. in Paddys Run at GMR (ug/l)	2.47E-01
Max. Conc. in GMR (ug/l)	2.60E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			8.65E-01	9.47E-04	6.59E-02
D-E	7.5	11.3	13.9		3.91E-01	4.28E-04	3.65E-02
E-F	0.6	1.4	1.0	1.1	1.28E-01	1.41E-04	1.42E-02
SSOD				49.2	3.75E+00	4.11E-03	1.51E-01
TOTAL					5.14E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.69E+01	6.93E-04	3.42E-04
D-E	2.51E+01	3.06E-04	1.51E-04
E-F	5.57E+00	6.79E-05	3.35E-05
SSOD	1.25E+02	1.52E-03	7.52E-04
TOTAL	2.13E+02	2.59E-03	1.28E-03

CPC SCREENING | **CADMIUM RISK CRITERIA :** 1.80E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.92E-04	YES	6.48E-02	YES	Sub580	8.20E-05	YES	8.20E-02	YES
WPA	2.04E-04	YES	6.48E-02	YES	PDAR	3.13E-04	YES	1.51E-01	YES
Sub570	3.52E-04	YES	6.48E-02	YES	Sub581	5.50E-05	YES	5.50E-02	YES
Sub575	3.90E-05	YES	3.90E-02	YES	Sub582	5.44E-05	YES	5.44E-02	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** CHROMIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/30/94 10 14

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.16E-04	2.00E+00	1.70E+05	2.00E-01	8.31E-05
WPA	2.97E-04	1.01E+00	1.20E+05	5.09E-01	1.51E-04
Sub570	3.60E-04	2.03E+00	1.99E+05	6.25E-01	2.25E-04
Sub575	3.02E-04	1.05E+00	1.23E+05	2.11E-01	6.37E-05
Sub580	2.38E-04	2.92E-01	4.34E+04	4.40E-02	1.05E-05
PDAR	7.32E-04	1.46E+01	7.06E+05	9.28E-01	6.80E-04
Sub581	3.85E-04	4.90E+00	4.49E+05	4.17E-01	1.61E-04
Sub582	3.32E-04	3.46E+00	3.68E+05	2.97E-01	9.85E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.16E-04	2.00E+00	1.81E+01
WPA & sub570	3.36E-04	3.04E+00	1.52E+01
sub575	3.02E-04	1.05E+00	1.34E+01
Sub 580,PDAR, 581 & 582	5.25E-04	2.33E+01	2.22E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.36E-01	1.52E+01
D-D	3.36E-01	1.52E+01
E-E	5.22E-01	2.21E+01
Max:	5.22E-01	2.21E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	9.34E-02
Avg. Conc. in GMR (ug/l)	9.81E-03
Max. Conc. in Paddys Run at GMR (ug/l)	4.36E-01
Max. Conc. in GMR (ug/l)	4.58E-02
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.84E+01
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.94E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell
C-D	20.6	25.2			1.18E+00	1.29E-03	8.97E-02
D-E	7.5	11.3	13.9		6.39E-01	7.01E-04	5.98E-02
E-F	0.6	1.4	1.0	1.1	3.21E-01	3.52E-04	3.57E-02
SSOD				49.2	1.15E+01	1.26E-02	4.60E-01
TOTAL					1.36E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	9.37E+01	1.14E-03	5.63E-04
D-E	5.24E+01	6.38E-04	3.15E-04
E-F	1.38E+01	1.69E-04	8.31E-05
SSOD	3.98E+02	4.84E-03	2.39E-03
TOTAL	5.58E+02	6.79E-03	3.35E-03

CPC SCREENING **CHROMIUM RISK CRITERIA :** 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.16E-04	YES	9.81E-02	YES	Sub580	2.38E-04	YES	2.38E-01	YES
WPA	2.97E-04	YES	9.81E-02	YES	PDAR	7.32E-04	YES	4.60E-01	YES
Sub570	3.60E-04	YES	9.81E-02	YES	Sub581	3.85E-04	YES	3.85E-01	YES
Sub575	3.02E-04	YES	9.81E-02	YES	Sub582	3.32E-04	YES	3.32E-01	YES

PADDYS RUN BASIN | **CHEMICAL:** HEXAVALENT CHROMIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/30/94 10:16

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.68E-03	8.08E+00	1.70E+05	2.00E-01	3.36E-04
WPA	1.20E-03	4.07E+00	1.20E+05	5.09E-01	6.10E-04
Sub570	1.46E-03	8.20E+00	1.99E+05	6.25E-01	9.09E-04
Sub575	1.22E-03	4.24E+00	1.23E+05	2.11E-01	2.57E-04
Sub580	9.60E-04	1.18E+00	4.34E+04	4.40E-02	4.22E-05
PDAR	2.96E-03	5.91E+01	7.06E+05	9.28E-01	2.74E-03
Sub581	1.55E-03	1.98E+01	4.49E+05	4.17E-01	6.48E-04
Sub582	1.34E-03	1.40E+01	3.68E+05	2.97E-01	3.98E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.68E-03	8.08E+00	1.80E+00
WPA & sub570	1.36E-03	1.23E+01	1.52E+00
sub575	1.22E-03	4.24E+00	1.34E+00
Sub 580,PDAR, 581 & 582	2.12E-03	9.40E+01	2.21E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.36E+00	1.52E+00
D-D	1.36E+00	1.52E+00
E-E	2.11E+00	2.20E+00
Max:	2.11E+00	2.20E+00

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.77E-01
Avg. Conc. in GMR (ug/l)	3.96E-02
Max. Conc. in Paddys Run at GMR (ug/l)	1.76E+00
Max. Conc. in GMR (ug/l)	1.85E-01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.84E+00
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.93E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.76E+00	5.21E-03	3.62E-01
D-E	7.5	11.3	13.9		2.58E+00	2.83E-03	2.41E-01
E-F	0.6	1.4	1.0	1.1	1.30E+00	1.42E-03	1.44E-01
SSOD				49.2	4.63E+01	5.07E-02	1.86E+00
TOTAL					5.49E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.78E+02	4.61E-03	2.27E-03
D-E	2.12E+02	2.58E-03	1.27E-03
E-F	5.59E+01	6.81E-04	3.36E-04
SSOD	1.61E+03	1.96E-02	9.64E-03
TOTAL	2.25E+03	2.74E-02	1.35E-02

CPC SCREENING | **HEXAVALENT CHROMIUM RISK CRITERIA :** 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.68E-03	YES	3.96E-01	YES	Sub580	9.60E-04	YES	9.60E-01	YES
WPA	1.20E-03	YES	3.96E-01	YES	PDAR	2.96E-03	YES	1.86E+00	YES
Sub570	1.46E-03	YES	3.96E-01	YES	Sub581	1.55E-03	YES	1.55E+00	YES
Sub575	1.22E-03	YES	3.96E-01	YES	Sub582	1.34E-03	YES	1.34E+00	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** COPPER | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 19 29

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.03E-03	2.42E+01	1.70E+05	2.00E-01	1.01E-03
WPA	4.50E-03	1.53E+01	1.20E+05	5.09E-01	2.29E-03
Sub570	5.85E-03	3.30E+01	1.99E+05	6.25E-01	3.66E-03
Sub575	3.55E-03	1.24E+01	1.23E+05	2.11E-01	7.49E-04
Sub580	3.63E-03	4.46E+00	4.34E+04	4.40E-02	1.60E-04
PDAR	1.61E-02	3.22E+02	7.06E+05	9.28E-01	1.50E-02
Sub581	2.29E-02	2.91E+02	4.49E+05	4.17E-01	9.55E-03
Sub582	5.47E-03	5.70E+01	3.68E+05	2.97E-01	1.63E-03

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.03E-03	2.42E+01	1.82E+01
WPA & sub570	5.34E-03	4.82E+01	2.02E+01
sub575	3.55E-03	1.24E+01	1.32E+01
Sub 580,PDAR, 581 & 582	1.52E-02	6.75E+02	5.31E+01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.34E+00	2.02E+01
D-D	5.34E+00	2.02E+01
E-E	1.51E+01	5.26E+01
Max:	1.51E+01	5.26E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.42E+00
Avg. Conc. in GMR (ug/l)	2.54E-01
Max. Conc. in Paddys Run at GMR (ug/l)	1.26E+01
Max. Conc. in GMR (ug/l)	1.32E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.71E+01	1.88E-02	1.31E+0[illegible]
D-E	7.5	11.3	13.9		8.99E+00	9.85E-03	8.40E-01
E-F	0.6	1.4	1.0	1.1	8.37E+00	9.17E-03	9.30E-01
SSOD				49.2	3.32E+02	3.64E-01	1.33E+01
TOTAL					3.67E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.26E+03	1.53E-02	7.55E-03
D-E	6.84E+02	8.33E-03	4.11E-03
E-F	3.17E+02	3.86E-03	1.90E-03
SSOD	1.12E+04	1.36E-01	6.70E-02
TOTAL	1.34E+04	1.63E-01	8.05E-02

CPC SCREENING | **COPPER RISK CRITERIA :** 1.40E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.03E-03	YES	1.40E+00	YES	Sub580	3.63E-03	YES	3.63E+00	YES
WPA	4.50E-03	YES	1.40E+00	YES	PDAR	1.61E-02	YES	1.34E+01	YES
Sub570	5.85E-03	YES	1.40E+00	YES	Sub581	2.29E-02	YES	1.34E+01	YES
Sub575	3.55E-03	YES	1.40E+00	YES	Sub582	5.47E-03	YES	5.47E+00	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** CYANIDE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date. 5/23/94 19:30

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.04E-01	4.98E+02	1.70E+05	2.00E-01	2.07E-02
WPA	6.79E-02	2.31E+02	1.20E+05	5.09E-01	3.46E-02
Sub570	8.24E-02	4.64E+02	1.99E+05	6.25E-01	5.15E-02
Sub575	7.23E-02	2.52E+02	1.23E+05	2.11E-01	1.52E-02
Sub580	5.33E-02	6.56E+01	4.34E+04	4.40E-02	2.35E-03
PDAR	1.38E-01	2.75E+03	7.06E+05	9.28E-01	1.28E-01
Sub581	1.88E-01	2.39E+03	4.49E+05	4.17E-01	7.85E-02
Sub582	9.21E-02	9.60E+02	3.68E+05	2.97E-01	2.74E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.04E-01	4.98E+02	3.80E-02
WPA & sub570	7.70E-02	6.95E+02	2.93E-02
sub575	7.23E-02	2.52E+02	2.72E-02
Sub 580,PDAR, 581 & 582	1.39E-01	6.17E+03	4.80E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	7.70E+01	2.93E-02
D-D	7.70E+01	2.93E-02
E-E	1.38E+02	4.78E-02
Max:	1.38E+02	4.78E-02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.42E+01
Avg. Conc. in GMR (ug/l)	2.54E+00
Max. Conc. in Paddys Run at GMR (ug/l)	1.15E+02
Max. Conc. in GMR (ug/l)	1.21E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.78E+02	3.04E-01	2.12E+01
D-E	7.5	11.3	13.9		1.51E+02	1.65E-01	1.41E+01
E-F	0.6	1.4	1.0	1.1	8.31E+01	9.11E-02	9.23E+00
SSOD				49.2	3.04E+03	3.33E+00	1.22E+02
TOTAL					3.55E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.27E+04	2.76E-01	1.36E-01
D-E	1.26E+04	1.54E-01	7.57E-02
E-F	3.55E+03	4.32E-02	2.13E-02
SSOD	1.06E+05	1.29E+00	6.36E-01
TOTAL	1.45E+05	1.76E+00	8.69E-01

CPC SCREENING | **CYANIDE RISK CRITERIA :** 7.30E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.04E-01	NO	2.32E+01	YES	Sub580	5.33E-02	YES	5.33E+01	YES
WPA	6.79E-02	YES	2.32E+01	YES	PDAR	1.38E-01	NO	1.22E+02	NO
Sub570	8.24E-02	NO	2.32E+01	YES	Sub581	1.88E-01	NO	1.22E+02	NO
Sub575	7.23E-02	YES	2.32E+01	YES	Sub582	9.21E-02	NO	9.21E+01	NO

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** LEAD | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:31

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.66E-04	3.21E+00	1.70E+05	2.00E-01	1.33E-04
WPA	2.56E-04	8.69E-01	1.20E+05	5.09E-01	1.30E-04
Sub570	2.71E-04	1.53E+00	1.99E+05	6.25E-01	1.69E-04
Sub575	2.45E-04	8.54E-01	1.23E+05	2.11E-01	5.18E-05
Sub580	5.76E-04	7.08E-01	4.34E+04	4.40E-02	2.54E-05
PDAR	1.05E-03	2.09E+01	7.06E+05	9.28E-01	9.71E-04
Sub581	2.03E-02	2.58E+02	4.49E+05	4.17E-01	8.45E-03
Sub582	2.79E-04	2.91E+00	3.68E+05	2.97E-01	8.28E-05

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.66E-04	3.21E+00	5.79E+01
WPA & sub570	2.65E-04	2.40E+00	2.39E+01
sub575	2.45E-04	8.54E-01	2.18E+01
Sub 580,PDAR, 581 & 582	6.36E-03	2.82E+02	5.22E+02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.65E-01	2.39E+01
D-D	2.65E-01	2.39E+01
E-E	6.27E+00	5.14E+02
Max:	6.27E+00	5.14E+02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	9.19E-01
Avg. Conc. in GMR (ug/l)	9.65E-02
Max. Conc. in Paddys Run at GMR (ug/l)	5.24E+00
Max. Conc. in GMR (ug/l)	5.50E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.26E+00	1.39E-03	9.64E-0
D-E	7.5	11.3	13.9		6.30E-01	6.90E-04	5.89E-02
E-F	0.6	1.4	1.0	1.1	3.17E+00	3.47E-03	3.52E-01
SSOD				49.2	1.39E+02	1.52E-01	5.58E+00
TOTAL					1.44E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.24E+02	1.51E-03	7.43E-04
D-E	5.98E+01	7.29E-04	3.59E-04
E-F	1.06E+02	1.28E-03	6.34E-04
SSOD	4.48E+03	5.45E-02	2.69E-02
TOTAL	4.77E+03	5.81E-02	2.86E-02

CPC SCREENING | **LEAD RISK CRITERIA :** 1.50E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.66E-04	YES	1.02E-01	YES	Sub580	5.76E-04	YES	5.76E-01	YES
WPA	2.56E-04	YES	1.02E-01	YES	PDAR	1.05E-03	YES	1.05E+00	YES
Sub570	2.71E-04	YES	1.02E-01	YES	Sub581	2.03E-02	NO	5.58E+00	NO
Sub575	2.45E-04	YES	1.02E-01	YES	Sub582	2.79E-04	YES	2.79E-01	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** MAGNESIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:33

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.32E+02	1.12E+06	1.70E+05	2.00E-01	4.64E+01
WPA	7.72E+01	2.62E+05	1.20E+05	5.09E-01	3.93E+01
Sub570	1.33E+02	7.49E+05	1.99E+05	6.25E-01	8.31E+01
Sub575	1.69E+02	5.88E+05	1.23E+05	2.11E-01	3.56E+01
Sub580	6.01E+01	7.39E+04	4.34E+04	4.40E-02	2.64E+00
PDAR	2.25E+02	4.49E+06	7.06E+05	9.28E-01	2.08E+02
Sub581	2.57E+02	3.27E+06	4.49E+05	4.17E-01	1.07E+02
Sub582	1.37E+02	1.43E+06	3.68E+05	2.97E-01	4.06E+01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.32E+02	1.12E+06	3.02E+04
WPA & sub570	1.12E+02	1.01E+06	1.53E+04
sub575	1.69E+02	5.88E+05	2.25E+04
Sub 580,PDAR, 581 & 582	2.09E+02	9.26E+06	2.62E+04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.12E+05	1.53E+04
D-D	1.12E+05	1.53E+04
E-E	2.07E+05	2.61E+04
Max:	2.07E+05	2.61E+04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.81E+04
Avg. Conc. in GMR (ug/l)	4.00E+03
Max. Conc. in Paddys Run at GMR (ug/l)	1.73E+05
Max. Conc. in GMR (ug/l)	1.82E+04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.85E+05	5.31E+02	3.70E+04
D-E	7.5	11.3	13.9		2.80E+05	3.07E+02	2.61E+04
E-F	0.6	1.4	1.0	1.1	1.29E+05	1.41E+02	1.43E+04
SSOD				49.2	4.55E+06	4.99E+03	1.83E+05
TOTAL					5.45E+06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.50E+07	5.47E+02	2.70E+02
D-E	2.60E+07	3.16E+02	1.56E+02
E-F	5.85E+06	7.12E+01	3.51E+01
SSOD	1.59E+08	1.93E+03	9.53E+02
TOTAL	2.35E+08	2.87E+03	1.41E+03

CPC SCREENING | **MAGNESIUM RISK CRITERIA :** 3.50E+04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.32E+02	NO	4.22E+04	NO	Sub580	6.01E+01	NO	6.01E+04	NO
WPA	7.72E+01	NO	4.22E+04	NO	PDAR	2.25E+02	NO	1.83E+05	NO
Sub570	1.33E+02	NO	4.22E+04	NO	Sub581	2.57E+02	NO	1.83E+05	NO
Sub575	1.69E+02	NO	4.22E+04	NO	Sub582	1.37E+02	NO	1.37E+05	NO

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** MANGANESE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19 34

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.63E-01	7.85E+02	1.70E+05	2.00E-01	3.26E-02
WPA	1.61E-01	5.49E+02	1.20E+05	5.09E-01	8.22E-02
Sub570	1.27E-01	7.17E+02	1.99E+05	6.25E-01	7.95E-02
Sub575	2.34E-01	8.14E+02	1.23E+05	2.11E-01	4.93E-02
Sub580	7.76E-02	9.54E+01	4.34E+04	4.40E-02	3.41E-03
PDAR	1.92E-01	3.84E+03	7.06E+05	9.28E-01	1.78E-01
Sub581	5.87E-01	7.47E+03	4.49E+05	4.17E-01	2.45E-01
Sub582	1.24E-01	1.30E+03	3.68E+05	2.97E-01	3.69E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.63E-01	7.85E+02	8.50E+02
WPA & sub570	1.40E-01	1.27E+03	7.53E+02
sub575	2.34E-01	8.14E+02	1.25E+03
Sub 580,PDAR, 581 & 582	2.86E-01	1.27E+04	1.43E+03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.40E+02	7.53E+02
D-D	1.40E+02	7.53E+02
E-E	2.84E+02	1.42E+03
Max:	2.84E+02	1.42E+03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.95E+01
Avg. Conc. in GMR (ug/l)	5.20E+00
Max. Conc. in Paddys Run at GMR (ug/l)	2.37E+02
Max. Conc. in GMR (ug/l)	2.49E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.81E+02	5.27E-01	3.66E+0
D-E	7.5	11.3	13.9		3.15E+02	3.45E-01	2.94E+01
E-F	0.6	1.4	1.0	1.1	1.70E+02	1.87E-01	1.89E+01
SSOD				49.2	6.25E+03	6.85E+00	2.51E+02
TOTAL					7.21E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.75E+04	4.57E-01	2.25E-01
D-E	2.69E+04	3.27E-01	1.61E-01
E-F	7.16E+03	8.71E-02	4.30E-02
SSOD	2.12E+05	2.58E+00	1.27E+00
TOTAL	2.83E+05	3.45E+00	1.70E+00

CPC SCREENING **MANGANESE RISK CRITERIA :** 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.63E-01	NO	4 44E+01	NO	Sub580	7.76E-02	NO	7.76E+01	NO
WPA	1.61E-01	NO	4 44E+01	NO	PDAR	1.92E-01	NO	1.92E+02	NO
Sub570	1.27E-01	NO	4 44E+01	NO	Sub581	5.87E-01	NO	2.51E+02	NO
Sub575	2.34E-01	NO	4.44E+01	NO	Sub582	1.24E-01	NO	1.24E+02	NO

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** MERCURY | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:35

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.02E-03	4.91E+00	1.70E+05	2.00E-01	2.04E-04
WPA	6.50E-04	2.21E+00	1.20E+05	5.09E-01	3.31E-04
Sub570	8.18E-04	4.61E+00	1.99E+05	6.25E-01	5.11E-04
Sub575	9.97E-04	3.47E+00	1.23E+05	2.11E-01	2.10E-04
Sub580	9.33E-04	1.15E+00	4.34E+04	4.40E-02	4.11E-05
PDAR	1.87E-03	3.74E+01	7.06E+05	9.28E-01	1.74E-03
Sub581	1.64E-03	2.08E+01	4.49E+05	4.17E-01	6.82E-04
Sub582	1.07E-03	1.11E+01	3.68E+05	2.97E-01	3.18E-04

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.02E-03	4.91E+00	2.96E-01
WPA & sub570	7.55E-04	6.82E+00	2.28E-01
sub575	9.97E-04	3.47E+00	2.95E-01
Sub 580,PDAR, 581 & 582	1.59E-03	7.05E+01	4.46E-01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	7.55E-01	2.28E-01
D-D	7.55E-01	2.28E-01
E-E	1.58E+00	4.42E-01
Max:	1.58E+00	4.42E-01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.73E-01
Avg. Conc. in GMR (ug/l)	2.86E-02
Max. Conc. in Paddys Run at GMR (ug/l)	1.32E+00
Max. Conc. in GMR (ug/l)	1.38E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.73E+00	2.99E-03	2.08E-01
D-E	7.5	11.3	13.9		1.62E+00	1.78E-03	1.52E-01
E-F	0.6	1.4	1.0	1.1	9.35E-01	1.02E-03	1.04E-01
SSOD				49.2	3.47E+01	3.80E-02	1.39E+00
TOTAL					4.00E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.23E+02	2.72E-03	1.34E-03
D-E	1.39E+02	1.69E-03	8.33E-04
E-F	3.97E+01	4.84E-04	2.39E-04
SSOD	1.21E+03	1.47E-02	7.27E-03
TOTAL	1.61E+03	1.96E-02	9.68E-03

CPC SCREENING | **MERCURY RISK CRITERIA :** 1.10E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.02E-03	YES	2.39E-01	YES	Sub580	9.33E-04	YES	9.33E-01	YES
WPA	6.50E-04	YES	2.39E-01	YES	PDAR	1.87E-03	NO	1.39E+00	NO
Sub570	8.18E-04	YES	2.39E-01	YES	Sub581	1.64E-03	NO	1.39E+00	NO
Sub575	9.97E-04	YES	2.39E-01	YES	Sub582	1.07E-03	YES	1.07E+00	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** MOLYBDENUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:37

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.56E-03	2.20E+01	1.70E+05	2.00E-01	9.13E-04
WPA	1.19E-03	4.04E+00	1.20E+05	5.09E-01	6.06E-04
Sub570	1.63E-03	9.20E+00	1.99E+05	6.25E-01	1.02E-03
Sub575	1.01E-03	3.52E+00	1.23E+05	2.11E-01	2.13E-04
Sub580	9.45E-04	1.16E+00	4.34E+04	4.40E-02	4.16E-05
PDAR	2.28E-03	4.55E+01	7.06E+05	9.28E-01	2.11E-03
Sub581	1.18E-03	1.50E+01	4.49E+05	4.17E-01	4.93E-04
Sub582	2.58E-03	2.69E+01	3.68E+05	2.97E-01	7.68E-04

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.56E-03	2.20E+01	1.19E+01
WPA & sub570	1.47E-03	1.32E+01	3.99E+00
sub575	1.01E-03	3.52E+00	2.70E+00
Sub 580,PDAR, 581 & 582	2.00E-03	8.86E+01	5.05E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.47E+00	3.99E+00
D-D	1.47E+00	3.99E+00
E-E	1.99E+00	5.03E+00
Max:	1.99E+00	5.03E+00

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.05E-01
Avg. Conc. in GMR (ug/l)	4.26E-02
Max. Conc. in Paddys Run at GMR (ug/l)	1.66E+00
Max. Conc. in GMR (ug/l)	1.75E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.86E+00	8.62E-03	5.99E-
D-E	7.5	11.3	13.9		3.63E+00	3.98E-03	3.40E-01
E-F	0.6	1.4	1.0	1.1	1.33E+00	1.45E-03	1.47E-01
SSOD				49.2	4.36E+01	4.78E-02	1.75E+00
TOTAL					5.64E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	8.13E+02	9.90E-03	4.88E-03
D-E	3.60E+02	4.39E-03	2.16E-03
E-F	6.89E+01	8.39E-04	4.14E-04
SSOD	1.64E+03	2.00E-02	9.84E-03
TOTAL	2.88E+03	3.51E-02	1.73E-02

CPC SCREENING | **MOLYBDENUM RISK CRITERIA :** 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.56E-03	YES	6.16E-01	YES	Sub580	9.45E-04	YES	9.45E-01	YES
WPA	1.19E-03	YES	6.16E-01	YES	PDAR	2.28E-03	YES	1.75E+00	YES
Sub570	1.63E-03	YES	6 16E-01	YES	Sub581	1.18E-03	YES	1.18E+00	YES
Sub575	1.01E-03	YES	6 16E-01	YES	Sub582	2.58E-03	YES	1.75E+00	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** NICKEL | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:38

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.05E-03	5.06E+00	1.70E+05	2.00E-01	2.10E-04
WPA	8.92E-04	3.03E+00	1.20E+05	5.09E-01	4.54E-04
Sub570	1.14E-03	6.43E+00	1.99E+05	6.25E-01	7.14E-04
Sub575	7.87E-04	2.74E+00	1.23E+05	2.11E-01	1.66E-04
Sub580	6.36E-04	7.82E-01	4.34E+04	4.40E-02	2.80E-05
PDAR	1.74E-03	3.48E+01	7.06E+05	9.28E-01	1.62E-03
Sub581	1.22E-03	1.55E+01	4.49E+05	4.17E-01	5.08E-04
Sub582	1.02E-03	1.06E+01	3.68E+05	2.97E-01	3.02E-04

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.05E-03	5.06E+00	1.98E+01
WPA & sub570	1.05E-03	9.47E+00	2.06E+01
sub575	7.87E-04	2.74E+00	1.52E+01
Sub 580,PDAR, 581 & 582	1.39E-03	6.17E+01	2.54E+01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.05E+00	2.06E+01
D-D	1.05E+00	2.06E+01
E-E	1.39E+00	2.53E+01
Max:	1.39E+00	2.53E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.51E-01
Avg. Conc. in GMR (ug/l)	2.64E-02
Max. Conc. in Paddys Run at GMR (ug/l)	1.16E+00
Max. Conc. in GMR (ug/l)	1.22E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.43E+00	3.76E-03	2.61E-01
D-E	7.5	11.3	13.9		1.83E+00	2.01E-03	1.71E-01
E-F	0.6	1.4	1.0	1.1	8.69E-01	9.53E-04	9.66E-02
SSOD				49.2	3.04E+01	3.33E-02	1.22E+00
TOTAL					3.65E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.56E+02	3.12E-03	1.54E-03
D-E	1.42E+02	1.73E-03	8.55E-04
E-F	3.77E+01	4.59E-04	2.26E-04
SSOD	1.07E+03	1.30E-02	6.41E-03
TOTAL	1.50E+03	1.83E-02	9.03E-03

CPC SCREENING | **NICKEL RISK CRITERIA :** 7.30E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.05E-03	YES	2.82E-01	YES	Sub580	6.36E-04	YES	6.36E-01	YES
WPA	8.92E-04	YES	2.82E-01	YES	PDAR	1.74E-03	YES	1.22E+00	YES
Sub570	1.14E-03	YES	2.82E-01	YES	Sub581	1.22E-03	YES	1.22E+00	YES
Sub575	7.87E-04	YES	2.82E-01	YES	Sub582	1.02E-03	YES	1.02E+00	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** SILVER | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator. DCW Date 5/23/94 19:39

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.47E-03	7.09E+00	1.70E+05	2.00E-01	2.94E-04
WPA	8.57E-04	2.91E+00	1.20E+05	5.09E-01	4.36E-04
Sub570	1.38E-03	7.75E+00	1.99E+05	6.25E-01	8.60E-04
Sub575	8.88E-05	3.09E-01	1.23E+05	2.11E-01	1.87E-05
Sub580	7.88E-05	9.69E-02	4.34E+04	4.40E-02	3.47E-06
PDAR	1.09E-03	2.19E+01	7.06E+05	9.28E-01	1.02E-03
Sub581	9.68E-04	1.23E+01	4.49E+05	4.17E-01	4.04E-04
Sub582	9.05E-05	9.43E-01	3.68E+05	2.97E-01	2.69E-05

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.47E-03	7.09E+00	7.68E+00
WPA & sub570	1.18E-03	1.07E+01	6.44E+00
sub575	8.88E-05	3.09E-01	4.74E-01
Sub 580,PDAR, 581 & 582	7.94E-04	3.52E+01	4.01E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.18E+00	6.44E+00
D-D	1.18E+00	6.44E+00
E-E	1.18E+00	6.44E+00
Max:	1.18E+00	6.44E+00

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.69E-01
Avg. Conc. in GMR (ug/l)	1.78E-02
Max. Conc. in Paddys Run at GMR (ug/l)	9.86E-01
Max. Conc. in GMR (ug/l)	1.04E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.15E+00	4.54E-03	3.16E-0
D-E	7.5	11.3	13.9		1.78E+00	1.95E-03	1.66E-01
E-F	0.6	1.4	1.0	1.1	5.82E-01	6.38E-04	6.47E-02
SSOD				49.2	1.73E+01	1.90E-02	6.96E-01
TOTAL					2.38E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.31E+02	4.03E-03	1.99E-03
D-E	1.35E+02	1.64E-03	8.09E-04
E-F	2.64E+01	3.22E-04	1.59E-04
SSOD	5.63E+02	6.86E-03	3.38E-03
TOTAL	1.06E+03	1.28E-02	6.34E-03

CPC SCREENING | **SILVER RISK CRITERIA :** 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.47E-03	YES	3.07E-01	YES	Sub580	7.88E-05	YES	7.88E-02	YES
WPA	8.57E-04	YES	3.07E-01	YES	PDAR	1.09E-03	YES	6.96E-01	YES
Sub570	1.38E-03	YES	3.07E-01	YES	Sub581	9.68E-04	YES	6.96E-01	YES
Sub575	8.88E-05	YES	8.88E-02	YES	Sub582	9.05E-05	YES	9.05E-02	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** THALLIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:40

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.50E-05	7.21E-02	1.70E+05	2.00E-01	3.00E-06
WPA	1.07E-05	3.63E-02	1.20E+05	5.09E-01	5.44E-06
Sub570	8.35E-06	4.70E-02	1.99E+05	6.25E-01	5.22E-06
Sub575	1.30E-05	4.54E-02	1.23E+05	2.11E-01	2.75E-06
Sub580	1.22E-05	1.50E-02	4.34E+04	4.40E-02	5.37E-07
PDAR	9.18E-06	1.84E-01	7.06E+05	9.28E-01	8.52E-06
Sub581	1.66E-05	2.11E-01	4.49E+05	4.17E-01	6.91E-06
Sub582	7.88E-06	8.21E-02	3.68E+05	2.97E-01	2.34E-06

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.50E-05	7.21E-02	6.51E-01
WPA & sub570	9.23E-06	8.34E-02	4.14E-01
sub575	1.30E-05	4.54E-02	5.80E-01
Sub 580,PDAR, 581 & 582	1.11E-05	4.91E-01	4.64E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.23E-03	4.14E-01
D-D	9.23E-03	4.14E-01
E-E	1.10E-02	4.63E-01
Max:	1.10E-02	4.63E-01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.20E-03
Avg. Conc. in GMR (ug/l)	2.31E-04
Max. Conc. in Paddys Run at GMR (ug/l)	9.23E-03
Max. Conc. in GMR (ug/l)	9.69E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA @ Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.59E-02	3.93E-05	2.73E-03
D-E	7.5	11.3	13.9		2.11E-02	2.32E-05	1.98E-03
E-F	0.6	1.4	1.0	1.1	7.46E-03	8.17E-06	8.29E-04
SSOD				49.2	2.42E-01	2.65E-04	9.71E-03
TOTAL					3.06E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.10E+00	3.77E-05	1.86E-05
D-E	1.88E+00	2.28E-05	1.13E-05
E-F	3.58E-01	4.36E-06	2.15E-06
SSOD	8.48E+00	1.03E-04	5.09E-05
TOTAL	1.38E+01	1.68E-04	8.29E-05

CPC SCREENING | **THALLIUM RISK CRITERIA :** 2.60E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.50E-05	YES	3.14E-03	YES	Sub580	1.22E-05	YES	9.72E-03	YES
WPA	1.07E-05	YES	3.14E-03	YES	PDAR	9.18E-06	YES	9.18E-03	YES
Sub570	8.35E-06	YES	3.14E-03	YES	Sub581	1.66E-05	YES	9.72E-03	YES
Sub575	1.30E-05	YES	3.14E-03	YES	Sub582	7.88E-06	YES	7.88E-03	YES

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** VANADIUM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 19:42

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	8.86E-04	4.27E+00	1.70E+05	2.00E-01	1.77E-04
WPA	7.92E-04	2.69E+00	1.20E+05	5.09E-01	4.03E-04
Sub570	9.83E-04	5.54E+00	1.99E+05	6.25E-01	6.14E-04
Sub575	8.73E-04	3.04E+00	1.23E+05	2.11E-01	1.84E-04
Sub580	7.10E-04	8.73E-01	4.34E+04	4.40E-02	3.12E-05
PDAR	9.35E-04	1.87E+01	7.06E+05	9.28E-01	8.67E-04
Sub581	9.99E-04	1.27E+01	4.49E+05	4.17E-01	4.16E-04
Sub582	8.40E-04	8.75E+00	3.68E+05	2.97E-01	2.49E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	37[illegible]
qp575	16.0	QSTA100(Rout27)	37[illegible]
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	8.86E-04	4.27E+00	2.57E+01
WPA & sub570	9.11E-04	8.23E+00	2.75E+01
sub575	8.73E-04	3.04E+00	2.59E+01
Sub 580,PDAR, 581 & 582	9.24E-04	4.10E+01	2.59E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.11E-01	2.75E+01
D-D	9.11E-01	2.75E+01
E-E	9.24E-01	2.75E+01
Max:	9.24E-01	2.75E+01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.80E-01
Avg. Conc. in GMR (ug/l)	1.89E-02
Max. Conc. in Paddys Run at GMR (ug/l)	7.72E-01
Max. Conc. in GMR (ug/l)	8.11E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.95E+00	3.24E-03	2.25E-0[illegible]
D-E	7.5	11.3	13.9		1.67E+00	1.83E-03	1.56E-01
E-F	0.6	1.4	1.0	1.1	6.22E-01	6.82E-04	6.91E-02
SSOD				49.2	2.02E+01	2.21E-02	8.11E-01
TOTAL					2.54E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.19E+02	2.66E-03	1.31E-03
D-E	1.32E+02	1.61E-03	7.93E-04
E-F	2.88E+01	3.51E-04	1.73E-04
SSOD	7.25E+02	8.82E-03	4.35E-03
TOTAL	1.10E+03	1.34E-02	6.63E-03

CPC SCREENING **VANADIUM RISK CRITERIA :** 2.60E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	8.86E-04	YES	2.51E-01	YES	Sub580	7.10E-04	YES	7.10E-01	YES
WPA	7.92E-04	YES	2.51E-01	YES	PDAR	9.35E-04	YES	8.11E-01	YES
Sub570	9.83E-04	YES	2.51E-01	YES	Sub581	9.99E-04	YES	8.11E-01	YES
Sub575	8.73E-04	YES	2.51E-01	YES	Sub582	8.40E-04	YES	8.11E-01	YES

DRAFT

PADDYS RUN BASIN	CHEMICAL: 1,1,2,2-TETRACHLOROETHANE	SCENARIO: WITHOUT STORMWATER CONTROLS Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 21:08

Subbasin	Cs Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	6.52E-46	1.30E-41	7.06E+05	9.28E-01	6.05E-46
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.94E-46	1.30E-41	1.14E-44

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	2.90E-43	1.13E-44
Max:	2.90E-43	1.13E-44

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.15E-44
Avg. Conc. in GMR (ug/l)	4.36E-45
Max. Conc. in Paddys Run at GMR (ug/l)	2.42E-43
Max. Conc. in GMR (ug/l)	2.54E-44

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.43E-43	1.57E-46	1.59E-44
SSOD				49.2	6.42E-42	7.03E-45	2.58E-43
TOTAL					6.56E-42		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	4.59E-42	5.59E-47	2.75E-47
SSOD	2.05E-40	2.50E-45	1.23E-45
TOTAL	2 10E-40	2.55E-45	1.26E-45

CPC SCREENING 1,1,2,2-TETRACHLOROETHANE RISK CRITERIA : 9.00E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	6.52E-46	YES	2.58E-43	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 1,1,2,2-TETRACHLOROET Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.54E-44	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.01E-43	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	6.63E-43	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.52E-46	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.30E-41	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.30E-41	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.16E-40	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** 1,1,2-TRICHLOROETHANE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 21:09

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.47E-11	1.09E-06	7.06E+05	9.28E-01	5.07E-11
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.46E-11	1.09E-06	1.15E-09

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	2.43E-08	1.13E-09
Max:	2.43E-08	1.13E-09

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.48E-09
Avg. Conc. in GMR (ug/l)	3.65E-10
Max. Conc. in Paddys Run at GMR (ug/l)	2.03E-08
Max. Conc. in GMR (ug/l)	2.13E-09

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.20E-08	1.32E-11	1.34E-09
SSOD				49.2	5.38E-07	5.89E-10	2.16E-08
TOTAL					5.50E-07		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	3.84E-07	4.68E-12	2.31E-12
SSOD	1.72E-05	2.09E-10	1.03E-10
TOTAL	1.76E-05	2.14E-10	1.06E-10

CPC SCREENING **1,1,2-TRICHLOROETHANE RISK CRITERIA :** 3.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	5.47E-11	YES	2.16E-08	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 1,1,2-TRICHLOROETHANE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.55E-09	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.02E-08	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	6.66E-08	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.47E-11	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.09E-06	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.60E-06	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.81E-05	0.00E+00	0.00E+00

DRAFT 1-6161

PADDYS RUN BASIN	CHEMICAL: 1,1-DICHLOROETHENE	SCENARIO: WITHOUT STORMWATER CONTROLS Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date. 5/23/94 21:11

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	2.08E-14	4.16E-10	7.06E+05	9.28E-01	1.93E-14
Sub581	1.39E-14	1.77E-10	4.49E+05	4.17E-01	5.80E-15
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.34E-14	5.93E-10	6.29E-14

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	1.32E-11	6.20E-14
Max:	1.32E-11	6.20E-14

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.89E-12
Avg. Conc. in GMR (ug/l)	1.98E-13
Max. Conc. in Paddys Run at GMR (ug/l)	1.10E-11
Max. Conc. in GMR (ug/l)	1.15E-12

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00.	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	6.52E-12	7.14E-15	7.24E-13
SSOD				49.2	2.92E-10	3.20E-13	1.17E-11
TOTAL					2.98E-10		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	2.09E-10	2.54E-15	1.25E-15
SSOD	9.33E-09	1.14E-13	5.60E-14
TOTAL	9.54E-09	1.16E-13	5.73E-14

CPC SCREENING 1,1-DICHLOROETHENE RISK CRITERIA : 6.70E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	2.08E-14	YES	1.17E-11	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	1.39E-14	YES	1.17E-11	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 1,1-DICHLOROETHENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	9.94E-14	6.34E-14	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	7.87E-13	5.51E-12	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.59E-12	9.16E-11	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.08E-14	1.39E-14	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.16E-10	1.77E-10	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.37E-09	2.94E-09	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.90E-09	2.94E-09	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: 1,2-DICHLOROETHANE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 21 13

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.08E-15	2.16E-11	7.06E+05	9.28E-01	1.00E-15
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	4.87E-16	2.16E-11	2.17E-15

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	4.80E-13	2.14E-15
Max:	4.80E-13	2.14E-15

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.87E-14
Avg. Conc. in GMR (ug/l)	7.22E-15
Max. Conc. in Paddys Run at GMR (ug/l)	4.01E-13
Max. Conc. in GMR (ug/l)	4.21E-14

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	2.38E-13	2.60E-16	2.64E-14
SSOD				49.2	1.06E-11	1.16E-14	4.27E-13
TOTAL					1.09E-11		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	7.60E-12	9.25E-17	4.56E-17
SSOD	3.40E-10	4.14E-15	2.04E-15
TOTAL	3 47E-10	4.23E-15	2.09E-15

CPC SCREENING | 1,2-DICHLOROETHANE RISK CRITERIA : 2.00E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.08E-15	YES	4.27E-13	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 1,2-DICHLOROETHANE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.82E-15	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.82E-14	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.26E-13	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.08E-15	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.16E-11	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	7.12E-11	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.58E-10	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN	CHEMICAL: 1,2-DICHLOROETHENE (TOTAL)	SCENARIO: WITHOUT STORMWATER CONTROLS Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 21:15

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	4.45E-14	8.89E-10	7.06E+05	9.28E-01	4.13E-14
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.00E-14	8.89E-10	9.57E-14

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	1.97E-11	9.43E-14
Max:	1.97E-11	9.43E-14

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.83E-12
Avg. Conc. in GMR (ug/l)	2.97E-13
Max. Conc. in Paddys Run at GMR (ug/l)	1.65E-11
Max. Conc. in GMR (ug/l)	1.73E-12

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	9.78E-12	1.07E-14	1.09E-12
SSOD				49.2	4.37E-10	4.79E-13	1.76E-11
TOTAL					4.47E-10		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	3.13E-10	3.81E-15	1.88E-15
SSOD	1.40E-08	1.70E-13	8.40E-14
TOTAL	1.43E-08	1.74E-13	8.59E-14

CPC SCREENING 1,2-DICHLOROETHENE (TOTAL) RISK CRITERIA : 3.70E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	4.45E-14	YES	1.76E-11	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 1,2-DICHLOROETHENE (T Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.12E-13	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.68E-12	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.55E-12	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.45E-14	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	8.89E-10	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.93E-09	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.47E-08	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: 2-BUTANONE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 21:16

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.28E-280	1.10E-276	1.70E+05	2.00E-01	4.55E-281
WPA	4.31E-278	1.47E-274	1.20E+05	5.09E-01	2.19E-278
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.07E-279	1.01E-274	7.06E+05	9.28E-01	4.70E-279
Sub581	1.02E-279	1.30E-275	4.49E+05	4.17E-01	4.27E-280
Sub582	2.80E-279	2.92E-275	3.68E+05	2.97E-01	8.31E-280

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.28E-280	1.10E-276	6.77E-281
WPA & sub570	1.62E-278	1.47E-274	4.62E-279
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.24E-279	1.44E-274	9.11E-280

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.62E-275	4.62E-279
D-D	1.62E-275	4.62E-279
E-E	1.62E-275	4.62E-279
Max:	1.62E-275	4.62E-279

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	9.26E-277
Avg. Conc. in GMR (ug/l)	9.73E-278
Max. Conc. in Paddys Run at GMR (ug/l)	1.35E-275
Max. Conc. in GMR (ug/l)	1.42E-276

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			###########	4.07E-278	2.83E-276
D-E	7.5	11.3	13.9		###########	1.82E-278	1.55E-276
E-F	0.6	1.4	1.0	1.1	###########	3.98E-279	4.04E-277
SSOD				49.2	###########	7.74E-278	2.84E-276
TOTAL					###########		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.60E-273	1.95E-278	9.59E-279
D-E	7.14E-274	8.69E-279	4.28E-279
E-F	1.56E-274	1.90E-279	9.37E-280
SSOD	2.52E-273	3.07E-278	1.51E-278
TOTAL	4.99E-273	6.07E-278	3.00E-278

CPC SCREENING | 2-BUTANONE RISK CRITERIA : 2.19E+03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.28E-280	YES	2.28E-277	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	4.31E-278	YES	2.72E-276	YES	PDAR	5.07E-279	YES	###########	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	1.02E-279	YES	###########	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	2.80E-279	YES	###########	YES

DRAFT

CHEMICAL: 2-BUTANONE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.77E-281	1.23E-278	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.33E-280	5.17E-278	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	2.74E-278	3.92E-277	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.28E-280	4.31E-278	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.10E-276	1.47E-274	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	4.74E-275	1.11E-273	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.79E-275	2.44E-273	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.45E-279	2.80E-280	7.54E-280
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.15E-278	2.43E-278	7.21E-279
Annual adsorbed contaminant quantity (g):	0.00E+00	3.79E-278	4.04E-277	1.86E-277
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.07E-279	1.02E-279	2.80E-279
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.01E-274	1.30E-275	2.92E-275
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.34E-274	2.17E-274	7.53E-274
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.68E-273	2.17E-274	5.00E-274

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DRAFT

PADDYS RUN BASIN | CHEMICAL: 4-METHYL-2-PENTANONE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date. 5/23/94 21:18

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.14E-278	5.50E-275	1.70E+05	2.00E-01	2.29E-279
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	2.63E-278	5.26E-274	7.06E+05	9.28E-01	2.44E-278
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.14E-278	5.50E-275	2.31E-278
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.19E-278	5.26E-274	2.31E-278

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations | Loading to the Great Miami Aquifer

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.29E-276	4.62E-279
D-D	2.29E-276	4.62E-279
E-E	1.17E-275	2.28E-278
Max:	1.17E-275	2.28E-278

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			##########	1.24E-278	8.64E-277
D-E	7.5	11.3	13.9		##########	4.52E-279	3.86E-277
E-F	0.6	1.4	1.0	1.1	##########	6.70E-279	6.79E-277
SSOD				49.2	##########	2.83E-277	1.04E-275
TOTAL					##########		

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.85E-276
Avg. Conc. in GMR (ug/l)	1.94E-277
Max. Conc. in Paddys Run at GMR (ug/l)	9.78E-276
Max. Conc. in GMR (ug/l)	1.03E-276

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.68E-273	2.05E-278	1.01E-278
D-E	6.12E-274	7.45E-279	3.68E-279
E-F	2.34E-274	2.85E-279	1.40E-279
SSOD	8.27E-273	1.01E-277	4.97E-278
TOTAL	1.08E-272	1.31E-277	6.48E-278

CPC SCREENING | 4-METHYL-2-PENTANONE RISK CRITERIA : 1.83E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.14E-278	YES	8.30E-277	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	2.63E-278	YES	##########	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 4-METHYL-2-PENTANONE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.31E-278	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.16E-277	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	9.35E-276	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.14E-278	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	5.50E-275	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.38E-273	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	8.99E-274	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.12E-278	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.06E-277	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.34E-276	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.63E-278	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	5.26E-274	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.73E-273	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	8.72E-273	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: ACETONE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 21:20

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.45E-279	1.66E-275	1.70E+05	2.00E-01	6.89E-280
WPA	6.70E-278	2.28E-274	1.20E+05	5.09E-01	3.41E-278
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	2.35E-278	8.18E-275	1.23E+05	2.11E-01	4.96E-279
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	6.42E-278	1.28E-273	7.06E+05	9.28E-01	5.96E-278
Sub581	1.57E-278	1.99E-274	4.49E+05	4.17E-01	6.54E-279
Sub582	3.35E-280	3.49E-276	3.68E+05	2.97E-01	9.94E-281

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.45E-279	1.66E-275	3.23E-280
WPA & sub570	2.52E-278	2.28E-274	2.26E-279
sub575	2.35E-278	8.18E-275	2.25E-279
Sub 580,PDAR, 581 & 582	3.35E-278	1.49E-273	3.00E-279

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.52E-275	2.26E-279
D-D	2.52E-275	2.26E-279
E-E	3.34E-275	2.99E-279
Max:	3.34E-275	2.99E-279

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.77E-276
Avg. Conc. in GMR (ug/l)	6.05E-277
Max. Conc. in Paddys Run at GMR (ug/l)	2.79E-275
Max. Conc. in GMR (ug/l)	2.93E-276

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			##########	6.66E-278	4.63E-276
D-E	7.5	11.3	13.9		##########	4.20E-278	3.58E-276
E-F	0.6	1.4	1.0	1.1	##########	2.24E-278	2.27E-276
SSOD				49.2	##########	8.01E-277	2.94E-275
TOTAL					##########		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.94E-273	3.58E-278	1.76E-278
D-E	2.49E-273	3.03E-278	1.49E-278
E-F	7.79E-274	9.48E-279	4.68E-279
SSOD	2.34E-272	2.85E-277	1.41E-277
TOTAL	2.96E-272	3.61E-277	1.78E-277

CPC SCREENING | ACETONE RISK CRITERIA : 3.65E+02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.45E-279	YES	3.45E-276	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	6.70E-278	YES	5.38E-276	YES	PDAR	6.42E-278	YES	##########	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	1.57E-278	YES	##########	YES
Sub575	2.35E-278	YES	5.38E-276	YES	Sub582	3.35E-280	YES	##########	YES

DRAFT

CHEMICAL: ACETONE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.23E-280	6.00E-279	0.00E+00	2.25E-279
Single storm adsorbed contaminant quantity PXi (g):	3.02E-279	2.53E-278	0.00E+00	5.00E-279
Annual adsorbed contaminant quantity (g):	1.31E-277	1.92E-277	0.00E+00	8.35E-278
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.45E-279	6.70E-278	0.00E+00	2.35E-278
Single storm dissolved contaminant quantity PQi (g):	1.66E-275	2.28E-274	0.00E+00	8.18E-275
Annual dis. conta. qt (based on sediment yield)(g):	7.18E-274	1.73E-273	0.00E+00	1.37E-273
Annual dis. conta. qt (based on runoff) (g):	2.71E-274	3.80E-273	0.00E+00	1.37E-273

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.79E-279	1.35E-279	2.92E-281
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.59E-278	1.17E-277	2.79E-280
Annual adsorbed contaminant quantity (g):	0.00E+00	1.51E-277	1.95E-276	7.21E-279
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.42E-278	1.57E-278	3.35E-280
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.28E-273	1.99E-274	3.49E-276
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.23E-273	3.32E-273	9.01E-275
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.13E-272	3.32E-273	5.97E-275

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PADDYS RUN BASIN | CHEMICAL: BENZENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 21:22

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.57E-15	1.24E-11	1.70E+05	2.00E-01	5.14E-16
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.79E-16	1.16E-11	7.06E+05	9.28E-01	5.37E-16
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.57E-15	1.24E-11	5.70E-14
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.61E-16	1.16E-11	5.57E-15

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.14E-13	1.14E-14
D-D	5.14E-13	1.14E-14
E-E	5.14E-13	1.14E-14
Max:	5.14E-13	1.14E-14

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.62E-14
Avg. Conc. in GMR (ug/l)	8.00E-15
Max. Conc. in Paddys Run at GMR (ug/l)	4.29E-13
Max. Conc. in GMR (ug/l)	4.51E-14

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.55E-12	2.79E-15	1.94E-13
D-E	7.5	11.3	13.9		9.28E-13	1.02E-15	8.67E-14
E-F	0.6	1.4	1.0	1.1	2.02E-13	2.21E-16	2.24E-14
SSOD				49.2	5.70E-12	6.24E-15	2.29E-13
TOTAL					9.37E-12		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.78E-10	4.60E-15	2.27E-15
D-E	1.38E-10	1.68E-15	8.26E-16
E-F	1.51E-11	1.84E-16	9.06E-17
SSOD	1.82E-10	2.22E-15	1.09E-15
TOTAL	7.13E-10	8.68E-15	4.28E-15

CPC SCREENING | BENZENE RISK CRITERIA : 6.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.57E-15	YES	1.87E-13	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	5.79E-16	YES	2.29E-13	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: BENZENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.70E-14	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	5.33E-13	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	2.31E-11	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.57E-15	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.24E-11	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	5.36E-10	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.02E-10	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.24E-14	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	9.80E-14	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.23E-13	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.79E-16	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.16E-11	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.81E-11	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.92E-10	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** BROMODICHLOROMETHANE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 21:23

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	2.65E-04	9.24E-01	1.23E+05	2.11E-01	5.60E-05
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	0.00E+00	0.00E+00	7.06E+05	9.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	2.65E-04	9.24E-01	3.39E-03
Sub 580,PDAR, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	5.59E-02	7.13E-04
E-E	5.59E-02	7.13E-04
Max:	5.59E-02	7.13E-04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.94E-03
Avg. Conc. in GMR (ug/l)	3.09E-04
Max. Conc. in Paddys Run at GMR (ug/l)	4.66E-02
Max. Conc. in GMR (ug/l)	4.90E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		1.28E-01	1.41E-04	1.20E-02
E-F	0.6	1.4	1.0	1.1	9.24E-03	1.01E-05	1.03E-03
SSOD				49.2	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.38E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	1.37E+01	1.67E-04	8.21E-05
E-F	9.84E-01	1.20E-05	5.91E-06
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.47E+01	1.79E-04	8.81E-05

CPC SCREENING | **BROMODICHLOROMETHANE RISK CRITERIA :** 1.40E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	2.65E-04	NO	1.05E-02	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: BROMODICHLOROMETH Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	3.39E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	7.51E-03
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	1.26E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	2.65E-04
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	9.24E-01
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	1.55E+01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	1.54E+01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN	CHEMICAL: BROMOMETHANE	SCENARIO: WITHOUT STORMWATER CONTROLS Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 21:25

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	8.66E-03	1.73E+02	7.06E+05	9.28E-01	8.04E-03
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.90E-03	1.73E+02	7.77E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	3.84E+00	7.65E-03
Max:	3.84E+00	7.65E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.51E-01
Avg. Conc. in GMR (ug/l)	5.78E-02
Max. Conc. in Paddys Run at GMR (ug/l)	3.21E+00
Max. Conc. in GMR (ug/l)	3.37E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.90E+00	2.09E-03	2.12E-01
SSOD				49.2	8.52E+01	9.33E-02	3.42E+00
TOTAL					8.71E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	6.09E+01	7.41E-04	3.66E-04
SSOD	2.72E+03	3.32E-02	1.64E-02
TOTAL	2.78E+03	3.39E-02	1.67E-02

CPC SCREENING BROMOMETHANE RISK CRITERIA : 1.08E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	8.66E-03	NO	3.42E+00	NO
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: BROMOMETHANE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.72E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.37E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	4.50E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	8.66E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.73E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.70E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.87E+03	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: CARBON DISULFIDE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 21:27

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.92E-06	2.37E-02	1.70E+05	2.00E-01	9.84E-07
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.83E-04	3.66E+00	7.06E+05	9.28E-01	1.70E-04
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.92E-06	2.37E-02	1.17E-04
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	8.25E-05	3.66E+00	1.89E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.84E-04	2.34E-05
D-D	9.84E-04	2.34E-05
E-E	8.12E-02	1.86E-03
Max:	8.12E-02	1.86E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.17E-02
Avg. Conc. in GMR (ug/l)	1.23E-03
Max. Conc. in Paddys Run at GMR (ug/l)	6.78E-02
Max. Conc. in GMR (ug/l)	7.12E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.88E-03	5.35E-06	3.72E-04
D-E	7.5	11.3	13.9		1.78E-03	1.95E-06	1.66E-04
E-F	0.6	1.4	1.0	1.1	4.04E-02	4.42E-05	4.48E-03
SSOD				49.2	1.80E+00	1.97E-03	7.23E-02
TOTAL					1.85E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.24E-01	8.81E-06	4.35E-06
D-E	2.63E-01	3.21E-06	1.58E-06
E-F	1.31E+00	1.59E-05	7.85E-06
SSOD	5.75E+01	7.01E-04	3.46E-04
TOTAL	5.98E+01	7.29E-04	3.59E-04

CPC SCREENING | CARBON DISULFIDE RISK CRITERIA : 2.80E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.92E-06	YES	3.57E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.83E-04	YES	7.23E-02	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: CARBON DISULFIDE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.17E-04	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.10E-03	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	4.75E-02	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.92E-06	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.37E-02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.03E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.87E-01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.20E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.33E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.10E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.83E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.66E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.21E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.06E+01	0.00E+00	0.00E+00

PADDYS RUN BASIN | **CHEMICAL:** CHLOROFORM | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 21:29

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	1.07E-45	3.72E-42	1.23E+05	2.11E-01	2.25E-46
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.88E-46	3.76E-42	7.06E+05	9.28E-01	1.74E-46
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	1.07E-45	3.72E-42	1.67E-44
Sub 580,PDAR, 581 & 582	8.47E-47	3.76E-42	1.25E-45

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	2.25E-43	3.52E-45
E-E	2.25E-43	3.52E-45
Max:	2.25E-43	3.52E-45

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.38E-44
Avg. Conc. in GMR (ug/l)	2.50E-45
Max. Conc. in Paddys Run at GMR (ug/l)	1.88E-43
Max. Conc. in GMR (ug/l)	1.97E-44

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		5.17E-43	5.66E-46	4.83E-44
E-F	0.6	1.4	1.0	1.1	7.85E-44	8.60E-47	8.72E-45
SSOD				49.2	1.85E-42	2.03E-45	7.43E-44
TOTAL					2.44E-42		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	5.50E-41	6.70E-46	3.30E-46
E-F	5.28E-42	6.43E-47	3.17E-47
SSOD	5.91E-41	7.20E-46	3.55E-46
TOTAL	1.19E-40	1.45E-45	7.17E-46

CPC SCREENING | **CHLOROFORM RISK CRITERIA :** 2.80E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.88E-46	YES	7.43E-44	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	1.07E-45	YES	4.22E-44	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: CHLOROFORM Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	1.67E-44
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	3.71E-44
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	6.21E-43
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	1.07E-45
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	3.72E-42
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	6.22E-41
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	6.22E-41

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.77E-45	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.20E-44	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	7.24E-44	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.88E-46	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.76E-42	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.24E-41	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.23E-41	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: METHYLENE CHLORIDE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 21:30

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.98E-277	1.43E-273	1.70E+05	2.00E-01	5.96E-278
WPA	1.87E-279	6.35E-276	1.20E+05	5.09E-01	9.51E-280
Sub570	1.38E-278	7.76E-275	1.99E+05	6.25E-01	8.61E-279
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.86E-278	3.72E-274	7.06E+05	9.28E-01	1.73E-278
Sub581	6.72E-279	8.55E-275	4.49E+05	4.17E-01	2.80E-279
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.98E-277	1.43E-273	8.60E-277
WPA & sub570	9.30E-279	8.40E-275	2.88E-278
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.03E-278	4.57E-274	2.88E-278

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.96E-275	1.72E-277
D-D	5.96E-275	1.72E-277
E-E	5.96E-275	1.72E-277
Max:	5.96E-275	1.72E-277

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.28E-276
Avg. Conc. in GMR (ug/l)	6.60E-277
Max. Conc. in Paddys Run at GMR (ug/l)	4.98E-275
Max. Conc. in GMR (ug/l)	5.23E-276

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			#########	3.47E-277	2.41E-275
D-E	7.5	11.3	13.9		#########	1.28E-277	1.09E-275
E-F	0.6	1.4	1.0	1.1	#########	1.62E-278	1.65E-276
SSOD				49.2	#########	2.46E-277	9.04E-276
TOTAL					#########		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.47E-272	5.45E-277	2.69E-277
D-E	1.64E-272	1.99E-277	9.82E-278
E-F	1.49E-273	1.82E-278	8.97E-279
SSOD	7.20E-273	8.76E-278	4.32E-278
TOTAL	6.98E-272	8.50E-277	4 19E-277

CPC SCREENING

METHYLENE CHLORIDE RISK CRITERIA : 6.30E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.98E-277	YES	2.32E-275	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	1.87E-279	YES	1.87E-276	YES	PDAR	1.86E-278	YES	##########	YES
Sub570	1.38E-278	YES	1.38E-275	YES	Sub581	6.72E-279	YES	##########	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: METHYLENE CHLORIDE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.60E-277	5.23E-279	4.30E-278	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	8.04E-276	2.20E-278	1.91E-277	0.00E+00
Annual adsorbed contaminant quantity (g):	3.48E-274	1.67E-277	1.72E-276	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.98E-277	1.87E-279	1.38E-278	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.43E-273	6.35E-276	7.76E-275	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	6.21E-272	4.82E-275	6.97E-274	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.34E-272	1.06E-274	1.30E-273	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.24E-278	1.81E-278	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.15E-277	1.57E-276	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.37E-276	2.61E-275	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.86E-278	6.72E-279	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.72E-274	8.55E-275	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.22E-273	1.42E-273	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.16E-273	1.42E-273	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** STYRENE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 21:32

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	7.93E-42	1.59E-37	7.06E+05	9.28E-01	7.36E-42
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.58E-42	1.59E-37	5.04E-40

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	3.52E-39	4.96E-40
Max:	3.52E-39	4.96E-40

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.04E-40
Avg. Conc. in GMR (ug/l)	5.30E-41
Max. Conc. in Paddys Run at GMR (ug/l)	2.94E-39
Max. Conc. in GMR (ug/l)	3.09E-40

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.74E-39	1.91E-42	1.94E-40
SSOD				49.2	7.80E-38	8.55E-41	3.14E-39
TOTAL					7.98E-38		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	5.58E-38	6.79E-43	3.35E-43
SSOD	2.50E-36	3.04E-41	1.50E-41
TOTAL	2.55E-36	3.11E-41	1.53E-41

CPC SCREENING | **STYRENE RISK CRITERIA :** 2.80E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	7.93E-42	YES	3.14E-39	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: STYRENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.12E-39	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	8.86E-39	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.92E-38	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.93E-42	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.59E-37	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.22E-37	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.63E-36	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: TETRACHLOROETHENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 21:34

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.36E-09	6.53E-06	1.70E+05	2.00E-01	2.71E-10
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	5.11E-08	1.02E-03	7.06E+05	9.28E-01	4.74E-08
Sub581	2.80E-10	3.55E-06	4.49E+05	4.17E-01	1.17E-10
Sub582	1.19E-09	1.23E-05	3.68E+05	2.97E-01	3.52E-10

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.36E-09	6.53E-06	7.55E-08
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.34E-08	1.04E-03	1.25E-06

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.71E-07	1.51E-08
D-D	2.71E-07	1.51E-08
E-E	2.30E-05	1.23E-06
Max:	2.30E-05	1.23E-06

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.32E-06
Avg. Conc. in GMR (ug/l)	3.49E-07
Max. Conc. in Paddys Run at GMR (ug/l)	1.92E-05
Max. Conc. in GMR (ug/l)	2.02E-06

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.35E-06	1.47E-09	1.03E-07
D-E	7.5	11.3	13.9		4.90E-07	5.37E-10	4.58E-08
E-F	0.6	1.4	1.0	1.1	1.14E-05	1.25E-08	1.27E-06
SSOD				49.2	5.10E-04	5.59E-07	2.05E-05
TOTAL					5.24E-04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.00E-04	2.43E-09	1.20E-09
D-E	7.27E-05	8.85E-10	4.36E-10
E-F	3.73E-04	4.54E-09	2.24E-09
SSOD	1.64E-02	2.00E-07	9.86E-08
TOTAL	1.71E-02	2.08E-07	1.03E-07

CPC SCREENING | TETRACHLOROETHENE RISK CRITERIA : 3.70E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.36E-09	YES	9.85E-08	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	5.11E-08	YES	2.05E-05	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	2.80E-10	YES	2.80E-07	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	1.19E-09	YES	1.19E-06	YES

DRAFT

CHEMICAL: TETRACHLOROETHENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.55E-08	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	7.07E-07	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	3.06E-05	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.36E-09	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	6.53E-06	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.83E-04	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.07E-04	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.74E-06	1.43E-08	5.98E-08
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.17E-05	1.24E-06	5.72E-07
Annual adsorbed contaminant quantity (g):	0.00E+00	7.15E-05	2.07E-05	1.48E-05
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	5.11E-08	2.80E-10	1.19E-09
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.02E-03	3.55E-06	1.23E-05
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.36E-03	5.91E-05	3.19E-04
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.69E-02	5.91E-05	2.12E-04

PADDYS RUN BASIN | CHEMICAL: TRICHLOROETHENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW Date: 5/23/94 21:36

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.15E-09	5.55E-06	1.70E+05	2.00E-01	2.30E-10
WPA	9.18E-10	3.12E-06	1.20E+05	5.09E-01	4.67E-10
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.11E-06	2.21E-02	7.06E+05	9.28E-01	1.03E-06
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	7.85E-10	8.18E-06	3.68E+05	2.97E-01	2.33E-10

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.15E-09	5.55E-06	6.42E-08
WPA & sub570	3.45E-10	3.12E-06	1.84E-08
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	4.99E-07	2.21E-02	2.67E-05

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.45E-07	1.84E-08
D-D	3.45E-07	1.84E-08
E-E	4.91E-04	2.63E-05
Max:	4.91E-04	2.63E-05

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.04E-05
Avg. Conc. in GMR (ug/l)	7.39E-06
Max. Conc. in Paddys Run at GMR (ug/l)	4.10E-04
Max. Conc. in GMR (ug/l)	4.31E-05

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.93E-06	2.11E-09	1.47E-07
D-E	7.5	11.3	13.9		7.69E-07	8.42E-10	7.18E-08
E-F	0.6	1.4	1.0	1.1	2.43E-04	2.67E-07	2.70E-05
SSOD				49.2	1.09E-02	1.19E-05	4.37E-04
TOTAL					1.11E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.03E-04	2.47E-09	1.22E-09
D-E	7.66E-05	9.33E-10	4.60E-10
E-F	7.79E-03	9.48E-08	4.68E-08
SSOD	3.48E-01	4.24E-06	2.09E-06
TOTAL	3.56E-01	4.34E-06	2.14E-06

CPC SCREENING

TRICHLOROETHENE RISK CRITERIA : 2.50E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.15E-09	YES	1.41E-07	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	9.18E-10	YES	1.41E-07	YES	PDAR	1.11E-06	YES	4.37E-04	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	7.85E-10	YES	7.85E-07	YES

DRAFT

CHEMICAL: TRICHLOROETHENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.42E-08	4.89E-08	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.01E-07	2.06E-07	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	2.60E-05	1.56E-06	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.15E-09	9.18E-10	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	5.55E-06	3.12E-06	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.40E-04	2.37E-05	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	9.06E-05	5.20E-05	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.93E-05	0.00E+00	3.96E-08
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.70E-04	0.00E+00	3.79E-07
Annual adsorbed contaminant quantity (g):	0.00E+00	1.55E-03	0.00E+00	9.79E-06
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.11E-06	0.00E+00	7.85E-10
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.21E-02	0.00E+00	8.18E-06
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	7.28E-02	0.00E+00	2.11E-04
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.67E-01	0.00E+00	1.40E-04

DRAFT

PADDYS RUN BASIN | CHEMICAL: 2,4-DICHLOROPHENOL | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 20:20

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	2.42E-183	4.84E-179	7.06E+05	9.28E-01	2.25E-183
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.09E-183	4.84E-179	9.70E-182

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	1.07E-180	9.55E-182
Max:	1.07E-180	9.55E-182

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.54E-181
Avg. Conc. in GMR (ug/l)	1.62E-182
Max. Conc. in Paddys Run at GMR (ug/l)	8.97E-181
Max. Conc. in GMR (ug/l)	9.42E-182

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	##########	5.83E-184	5.91E-182
SSOD				49.2	##########	2.61E-182	9.56E-181
TOTAL					##########		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	1.70E-179	2.07E-184	1.02E-184
SSOD	7.61E-178	9.27E-183	4.57E-183
TOTAL	7.78E-178	9.47E-183	4.67E-183

CPC SCREENING | 2,4-DICHLOROPHENOL RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	2.42E-183	YES	##########	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 2,4-DICHLOROPHENOL Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.15E-181	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.71E-180	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.62E-180	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.42E-183	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.84E-179	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.59E-178	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	8.02E-178	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** 2,4-DINITROTOLUENE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 20 23

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	3.77E-25	7.54E-21	7.06E+05	9.28E-01	3.50E-25
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.70E-25	7.54E-21	2.55E-24

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	1.67E-22	2.52E-24
Max:	1.67E-22	2.52E-24

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.40E-23
Avg. Conc. in GMR (ug/l)	2.52E-24
Max. Conc. in Paddys Run at GMR (ug/l)	1.40E-22
Max. Conc. in GMR (ug/l)	1.47E-23

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	8.30E-23	9.09E-26	9.21E-24
SSOD				49.2	3.71E-21	4.07E-24	1.49E-22
TOTAL					3.79E-21		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	2.65E-21	3.23E-26	1.59E-26
SSOD	1.19E-19	1.44E-24	7.12E-25
TOTAL	1.21E-19	1.48E-24	7.28E-25

CPC SCREENING | **2,4-DINITROTOLUENE RISK CRITERIA :** 1.30E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	3.77E-25	YES	1.49E-22	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 2,4-DINITROTOLUENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	5.67E-24	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.49E-23	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.48E-22	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.77E-25	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	7.54E-21	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.48E-20	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.25E-19	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 2,6-DINITROTOLUENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 6/18/94 16:03

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	8.63E-27	1.73E-22	7.06E+05	9.28E-01	8.01E-27
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.89E-27	1.73E-22	1.17E-25

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	3.83E-24	1.15E-25
Max:	3.83E-24	1.15E-25

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.49E-25
Avg. Conc. in GMR (ug/l)	5.76E-26
Max. Conc. in Paddys Run at GMR (ug/l)	3.20E-24
Max. Conc. in GMR (ug/l)	3.36E-25
Max. Sed. Conc. in P.R. at GMR (mg/kg)	9.61E-26
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.01E-26

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.90E-24	2.08E-27	2.11E-25
SSOD				49.2	8.49E-23	9.30E-26	3.41E-24
TOTAL					8.68E-23		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	6.07E-23	7.39E-28	3.64E-28
SSOD	2.71E-21	3.30E-26	1.63E-26
TOTAL	2.77E-21	3.38E-26	1.67E-26

CPC SCREENING | 2,6-DINITROTOLUENE RISK CRITERIA : 1.30E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	8.63E-27	YES	3.41E-24	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 2,6-DINITROTOLUENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.59E-25	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.06E-24	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	6.77E-24	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	8.63E-27	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.73E-22	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.68E-22	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.86E-21	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: 2-CHLOROPHENOL | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator DCW | Date. 5/23/94 20:27

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.11E-04	1.50E+00	1.70E+05	2.00E-01	6.22E-05
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	0.00E+00	0.00E+00	7.06E+05	9.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.11E-04	1.50E+00	7.11E-03
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	0.00E+00	0.00E+00	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	6.22E-02	1.42E-03
D-D	6.22E-02	1.42E-03
E-E	6.22E-02	1.42E-03
Max:	6.22E-02	1.42E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.77E-03
Avg. Conc. in GMR (ug/l)	5.01E-04
Max. Conc. in Paddys Run at GMR (ug/l)	5.20E-02
Max. Conc. in GMR (ug/l)	5.46E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.09E-01	3.38E-04	2.35E-02
D-E	7.5	11.3	13.9		1.12E-01	1.23E-04	1.05E-02
E-F	0.6	1.4	1.0	1.1	8.99E-03	9.85E-06	9.98E-04
SSOD				49.2	0.00E+00	0.00E+00	0.00E+00
TOTAL					4.30E-01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.58E+01	5.57E-04	2.75E-04
D-E	1.67E+01	2.03E-04	1.00E-04
E-F	1.33E+00	1.62E-05	8.01E-06
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	6.38E+01	7.77E-04	3.83E-04

CPC SCREENING | 2-CHLOROPHENOL RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.11E-04	YES	2.26E-02	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 2-CHLOROPHENOL Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	7.11E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.66E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	2.88E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.11E-04	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.50E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	6.49E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	2.45E+01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: 3,3'-DICHLOROBENZIDINE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 20:30

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	5.24E-26	2.52E-22	1.70E+05	2.00E-01	1.05E-26
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	0.00E+00	0.00E+00	7.06E+05	9.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	5.24E-26	2.52E-22	2.75E-23
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.05E-23	5.50E-24
D-D	1.05E-23	5.50E-24
E-E	1.05E-23	5.50E-24
Max:	1.05E-23	5.50E-24

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	8.03E-25
Avg. Conc. in GMR (ug/l)	8.44E-26
Max. Conc. in Paddys Run at GMR (ug/l)	8.76E-24
Max. Conc. in GMR (ug/l)	9.20E-25

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA @ Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.20E-23	5.70E-26	3.96E-24
D-E	7.5	11.3	13.9		1.89E-23	2.08E-26	1.77E-24
E-F	0.6	1.4	1.0	1.1	1.51E-24	1.66E-27	1.68E-25
SSOD				49.2	0.00E+00	0.00E+00	0.00E+00
TOTAL					7.25E-23		-

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	7.72E-21	9.39E-26	4.63E-26
D-E	2.81E-21	3.42E-26	1.69E-26
E-F	2.25E-22	2.74E-27	1.35E-27
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.07E-20	1.31E-25	6.45E-26

CPC SCREENING | 3,3'-DICHLOROBENZIDINE RISK CRITERIA : 1.90E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	5.24E-26	YES	3.81E-24	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 3,3'-DICHLOROBENZIDIN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.75E-23	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.57E-22	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.11E-20	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	5.24E-26	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.52E-22	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.09E-20	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.12E-21	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** 4-METHYLPHENOL | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20:34

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.41E-05	2.12E-01	1.70E+05	2.00E-01	8.83E-06
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	8.13E-03	2.83E+01	1.23E+05	2.11E-01	1.71E-03
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	4.93E-04	9.86E+00	7.06E+05	9.28E-01	4.57E-04
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	1.04E-01	1.08E+03	3.68E+05	2.97E-01	3.08E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.41E-05	2.12E-01	5.76E-04
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	8.13E-03	2.83E+01	1.08E-01
Sub 580,PDAR, 581 & 582	2.46E-02	1.09E+03	2.91E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.83E-03	1.15E-04
D-D	1.71E+00	2.29E-02
E-E	2.42E+01	2.87E-01
Max:	2.42E+01	2.87E-01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.56E+00
Avg. Conc. in GMR (ug/l)	3.74E-01
Max. Conc. in Paddys Run at GMR (ug/l)	2.02E+01
Max. Conc. in GMR (ug/l)	2.12E+00

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.38E-02	4.80E-05	3.34E-03
D-E	7.5	11.3	13.9		3.95E+00	4.33E-03	3.69E-01
E-F	0.6	1.4	1.0	1.1	1.23E+01	1.34E-02	1.36E+00
SSOD				49.2	5.36E+02	5.88E-01	2.16E+01
TOTAL					5.53E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.49E+00	7.91E-05	3.90E-05
D-E	4.21E+02	5.13E-03	2.53E-03
E-F	6.32E+02	7.70E-03	3.80E-03
SSOD	2.69E+04	3.28E-01	1.62E-01
TOTAL	2.80E+04	3.41E-01	1.68E-01

CPC SCREENING | **4-METHYLPHENOL RISK CRITERIA :** 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.41E-05	YES	4.41E-02	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	4.93E-04	YES	4.93E-01	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	8.13E-03	YES	3.24E-01	YES	Sub582	1.04E-01	NO	2.16E+01	NO

DRAFT

CHEMICAL: 4-METHYLPHENOL Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	5.76E-04	0.00E+00	0.00E+00	1.08E-01
Single storm adsorbed contaminant quantity PXi (g):	5.39E-03	0.00E+00	0.00E+00	2.41E-01
Annual adsorbed contaminant quantity (g):	2.33E-01	0.00E+00	0.00E+00	4.02E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.41E-05	0.00E+00	0.00E+00	8.13E-03
Single storm dissolved contaminant quantity PQi (g):	2.12E-01	0.00E+00	0.00E+00	2.83E+01
Annual dis. conta. qt (based on sediment yield)(g):	9.20E+00	0.00E+00	0.00E+00	4.73E+02
Annual dis. conta. qt (based on runoff) (g):	3.47E+00	0.00E+00	0.00E+00	4.73E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.19E-03	0.00E+00	1.23E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.91E-02	0.00E+00	1.17E+01
Annual adsorbed contaminant quantity (g):	0.00E+00	1.62E-01	0.00E+00	3.03E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.93E-04	0.00E+00	1.04E-01
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	9.86E+00	0.00E+00	1.08E+03
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.25E+01	0.00E+00	2.79E+04
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.63E+02	0.00E+00	1.85E+04

PADDYS RUN BASIN | **CHEMICAL:** 4-NITROANILINE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 20:36

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.97E-03	3.35E+01	1.70E+05	2.00E-01	1.39E-03
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	0.00E+00	0.00E+00	7.06E+05	9.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.97E-03	3.35E+01	2.77E-02
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.39E+00	5.53E-03
D-D	1.39E+00	5.53E-03
E-E	1.39E+00	5.53E-03
Max:	1.39E+00	5.53E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.07E-01
Avg. Conc. in GMR (ug/l)	1.12E-02
Max. Conc. in Paddys Run at GMR (ug/l)	1.16E+00
Max. Conc. in GMR (ug/l)	1.22E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			6.91E+00	7.57E-03	5.27E-01
D-E	7.5	11.3	13.9		2.52E+00	2.76E-03	2.35E-01
E-F	0.6	1.4	1.0	1.1	2.01E-01	2.21E-04	2.24E-02
SSOD				49.2	0.00E+00	0.00E+00	0.00E+00
TOTAL					9.63E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.03E+03	1.25E-02	6.15E-03
D-E	3.73E+02	4.54E-03	2.24E-03
E-F	2.99E+01	3.64E-04	1.79E-04
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.43E+03	1.74E-02	8.57E-03

CPC SCREENING | **4-NITROANILINE RISK CRITERIA :** 1.10E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.97E-03	NO	5.06E-01	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: 4-NITROANILINE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.77E-02	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.59E-01	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.12E+01	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.97E-03	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.35E+01	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.45E+03	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	5.48E+02	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: BENZO(A)ANTHRACENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 20 37

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.40E-08	2.12E-04	1.70E+05	2.00E-01	8.80E-09
WPA	1.07E-09	3.62E-06	1.20E+05	5.09E-01	5.43E-10
Sub570	4.21E-09	2.37E-05	1.99E+05	6.25E-01	2.63E-09
Sub575	1.29E-09	4.48E-06	1.23E+05	2.11E-01	2.71E-10
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	3.40E-08	6.81E-04	7.06E+05	9.28E-01	3.16E-08
Sub581	3.57E-09	4.54E-05	4.49E+05	4.17E-01	1.49E-09
Sub582	3.10E-11	3.23E-07	3.68E+05	2.97E-01	9.22E-12

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.40E-08	2.12E-04	2.86E-03
WPA & sub570	3.03E-09	2.74E-05	2.07E-04
sub575	1.29E-09	4.48E-06	8.64E-05
Sub 580,PDAR, 581 & 582	1.64E-08	7.26E-04	1.03E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.80E-06	5.71E-04
D-D	8.80E-06	5.71E-04
E-E	1.63E-05	1.03E-03
Max:	1.63E-05	1.03E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.09E-06
Avg. Conc. in GMR (ug/l)	3.24E-07
Max. Conc. in Paddys Run at GMR (ug/l)	1.36E-05
Max. Conc. in GMR (ug/l)	1.43E-06

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.05E-05	5.54E-08	3.85E-06
D-E	7.5	11.3	13.9		1.96E-05	2.15E-08	1.83E-06
E-F	0.6	1.4	1.0	1.1	9.69E-06	1.06E-08	1.08E-06
SSOD				49.2	3.57E-04	3.92E-07	1.44E-05
TOTAL					4.37E-04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.77E-03	8.24E-08	4.06E-08
D-E	2.56E-03	3.11E-08	1.53E-08
E-F	4.68E-04	5.69E-09	2.81E-09
SSOD	1.14E-02	1.39E-07	6.86E-08
TOTAL	2.12E-02	2.58E-07	1.27E-07

CPC SCREENING | BENZO(A)ANTHRACENE RISK CRITERIA : 7.70E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.40E-08	YES	3.75E-06	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	1.07E-09	YES	1.07E-06	YES	PDAR	3.40E-08	YES	1.44E-05	YES
Sub570	4.21E-09	YES	3.75E-06	YES	Sub581	3.57E-09	YES	3.57E-06	YES
Sub575	1.29E-09	YES	1.29E-06	YES	Sub582	3.10E-11	YES	3.10E-08	YES

DRAFT

CHEMICAL: BENZO(A)ANTHRACENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.86E-03	6.71E-05	2.92E-04	8.64E-05
Single storm adsorbed contaminant quantity PXi (g):	2.67E-02	2.83E-04	1.30E-03	1.92E-04
Annual adsorbed contaminant quantity (g):	1.16E+00	2.14E-03	1.16E-02	3.21E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.40E-08	1.07E-09	4.21E-09	1.29E-09
Single storm dissolved contaminant quantity PQi (g):	2.12E-04	3.62E-06	2.37E-05	4.48E-06
Annual dis. conta. qt (based on sediment yield)(g):	9.17E-03	2.75E-05	2.13E-04	7.48E-05
Annual dis. conta. qt (based on runoff) (g):	3.46E-03	6.04E-05	3.98E-04	7.48E-05

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.15E-03	2.15E-04	1.90E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.71E-02	1.87E-02	1.82E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	5.62E-02	3.12E-01	4.69E-04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.40E-08	3.57E-09	3.10E-11
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	6.81E-04	4.54E-05	3.23E-07
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.24E-03	7.55E-04	8.35E-06
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.13E-02	7.55E-04	5.54E-06

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** BENZO(A)PYRENE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20:39

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.33E-08	1.12E-04	1.70E+05	2.00E-01	4.65E-09
WPA	4.96E-10	1.69E-06	1.20E+05	5.09E-01	2.53E-10
Sub570	1.44E-09	8.10E-06	1.99E+05	6.25E-01	8.98E-10
Sub575	4.90E-10	1.71E-06	1.23E+05	2.11E-01	1.03E-10
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.66E-08	3.32E-04	7.06E+05	9.28E-01	1.54E-08
Sub581	2.38E-09	3.03E-05	4.49E+05	4.17E-01	9.94E-10
Sub582	1.42E-11	1.48E-07	3.68E+05	2.97E-01	4.21E-12

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.33E-08	1.12E-04	3.60E-03
WPA & sub570	1.08E-09	9.78E-06	1.76E-04
sub575	4.90E-10	1.71E-06	7.87E-05
Sub 580,PDAR, 581 & 582	8.17E-09	3.62E-04	1.23E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.65E-06	7.20E-04
D-D	4.65E-06	7.20E-04
E-E	8.12E-06	1.22E-03
Max:	8.12E-06	1.22E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.55E-06
Avg. Conc. in GMR (ug/l)	1.62E-07
Max. Conc. in Paddys Run at GMR (ug/l)	6.78E-06
Max. Conc. in GMR (ug/l)	7.12E-07

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.55E-05	2.80E-08	1.95E-06
D-E	7.5	11.3	13.9		9.74E-06	1.07E-08	9.10E-07
E-F	0.6	1.4	1.0	1.1	4.81E-06	5.27E-09	5.34E-07
SSOD				49.2	1.78E-04	1.95E-07	7.16E-06
TOTAL					2.18E-04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.53E-03	4.29E-08	2.12E-08
D-E	1.32E-03	1.60E-08	7.91E-09
E-F	2.36E-04	2.87E-09	1.41E-09
SSOD	5.70E-03	6.94E-08	3.42E-08
TOTAL	1.08E-02	1.31E-07	6.47E-08

CPC SCREENING | **BENZO(A)PYRENE RISK CRITERIA :** 1.20E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.33E-08	YES	1.89E-06	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	4.96E-10	YES	4.96E-07	YES	PDAR	1.66E-08	YES	7.16E-06	YES
Sub570	1.44E-09	YES	1.44E-06	YES	Sub581	2.38E-09	YES	2.38E-06	YES
Sub575	4.90E-10	YES	4.90E-07	YES	Sub582	1.42E-11	YES	1.42E-08	YES

DRAFT

CHEMICAL: BENZO(A)PYRENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.60E-03	7.45E-05	2.37E-04	7.87E-05
Single storm adsorbed contaminant quantity PXi (g):	3.37E-02	3.14E-04	1.05E-03	1.75E-04
Annual adsorbed contaminant quantity (g):	1.46E+00	2.38E-03	9.47E-03	2.92E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.33E-08	4.96E-10	1.44E-09	4.90E-10
Single storm dissolved contaminant quantity PQi (g):	1.12E-04	1.69E-06	8.10E-06	1.71E-06
Annual dis. conta. qt (based on sediment yield)(g):	4.85E-03	1.28E-05	7.27E-05	2.85E-05
Annual dis. conta. qt (based on runoff) (g):	1.83E-03	2.81E-05	1.36E-04	2.85E-05

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.51E-03	3.43E-04	2.07E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.99E-02	2.98E-02	1.98E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	6.55E-02	4.96E-01	5.12E-04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.66E-08	2.38E-09	1.42E-11
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.32E-04	3.03E-05	1.48E-07
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.09E-03	5.04E-04	3.82E-06
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.50E-03	5.04E-04	2.53E-06

DRAFT

PADDYS RUN BASIN | CHEMICAL: BENZO(B)FLUORANTHENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date 5/23/94 20:41

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	3.62E-09	1.74E-05	1.70E+05	2.00E-01	7.23E-10
WPA	1.02E-10	3.47E-07	1.20E+05	5.09E-01	5.21E-11
Sub570	2.26E-10	1.27E-06	1.99E+05	6.25E-01	1.41E-10
Sub575	6.33E-11	2.20E-07	1.23E+05	2.11E-01	1.33E-11
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.38E-09	2.75E-05	7.06E+05	9.28E-01	1.28E-09
Sub581	5.44E-10	6.92E-06	4.49E+05	4.17E-01	2.27E-10
Sub582	2.54E-12	2.64E-08	3.68E+05	2.97E-01	7.53E-13

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	3.62E-09	1.74E-05	2.18E-03
WPA & sub570	1.79E-10	1.62E-06	1.13E-04
sub575	6.33E-11	2.20E-07	3.96E-05
Sub 580,PDAR, 581 & 582	7.77E-10	3.44E-05	4.53E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	7.23E-07	4.36E-04
D-D	7.23E-07	4.36E-04
E-E	7.76E-07	4.52E-04
Max:	7.76E-07	4.52E-04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.71E-07
Avg. Conc. in GMR (ug/l)	1.79E-08
Max. Conc. in Paddys Run at GMR (ug/l)	6.48E-07
Max. Conc. in GMR (ug/l)	6.80E-08

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.99E-06	4.38E-09	3.04E-07
D-E	7.5	11.3	13.9		1.52E-06	1.67E-09	1.42E-07
E-F	0.6	1.4	1.0	1.1	5.08E-07	5.57E-10	5.64E-08
SSOD	-			49.2	1.69E-05	1.86E-08	6.81E-07
TOTAL					2.30E-05		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.49E-04	6.69E-09	3.30E-09
D-E	2.05E-04	2.49E-09	1.23E-09
E-F	2.90E-05	3.53E-10	1.74E-10
SSOD	5.42E-04	6.60E-09	3.26E-09
TOTAL	1.33E-03	1.61E-08	7.96E-09

CPC SCREENING | BENZO(B)FLUORANTHENE RISK CRITERIA : 9.50E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	3.62E-09	YES	2.95E-07	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	1.02E-10	YES	1.02E-07	YES	PDAR	1.38E-09	YES	6.81E-07	YES
Sub570	2.26E-10	YES	2.26E-07	YES	Sub581	5.44E-10	YES	5.44E-07	YES
Sub575	6.33E-11	YES	6.33E-08	YES	Sub582	2.54E-12	YES	2.54E-09	YES

DRAFT

CHEMICAL: BENZO(B)FLUORANTHEN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.18E-03	5.98E-05	1.46E-04	3.96E-05
Single storm adsorbed contaminant quantity PXi (g):	2.04E-02	2.52E-04	6.48E-04	8.78E-05
Annual adsorbed contaminant quantity (g):	8.84E-01	1.91E-03	5.82E-03	1.47E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	3.62E-09	1.02E-10	2.26E-10	6.33E-11
Single storm dissolved contaminant quantity PQi (g):	1.74E-05	3.47E-07	1.27E-06	2.20E-07
Annual dis. conta. qt (based on sediment yield)(g):	7.54E-04	2.64E-06	1.14E-05	3.68E-06
Annual dis. conta. qt (based on runoff) (g):	2.84E-04	5.80E-06	2.13E-05	3.68E-06

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	8.09E-04	3.05E-04	1.44E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	6.41E-03	2.66E-02	1.38E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	2.11E-02	4.42E-01	3.57E-04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.38E-09	5.44E-10	2.54E-12
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.75E-05	6.92E-06	2.64E-08
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	9.06E-05	1.15E-04	6.83E-07
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	4.56E-04	1.15E-04	4.53E-07

DRAFT

PADDYS RUN BASIN | CHEMICAL: BENZO(K)FLUORANTHENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: Investigator DCW Date 5/23/94 20 43

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.51E-07	1.21E-03	1.70E+05	2.00E-01	5.01E-08
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	1.95E-08	1.10E-04	1.99E+05	6.25E-01	1.22E-08
Sub575	6.57E-09	2.29E-05	1.23E+05	2.11E-01	1.39E-09
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.74E-07	3.48E-03	7.06E+05	9.28E-01	1.62E-07
Sub581	3.50E-08	4.45E-04	4.49E+05	4.17E-01	1.46E-08
Sub582	9.16E-11	9.55E-07	3.68E+05	2.97E-01	2.72E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.51E-07	1.21E-03	2.81E-01
WPA & sub570	1.22E-08	1.10E-04	1.46E-02
sub575	6.57E-09	2.29E-05	7.65E-03
Sub 580,PDAR, 581 & 582	8.86E-08	3.93E-03	9.65E-02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.01E-05	5.62E-02
D-D	5.01E-05	5.62E-02
E-E	8.80E-05	9.59E-02
Max:	8.80E-05	9.59E-02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.68E-05
Avg. Conc. in GMR (ug/l)	1.76E-06
Max. Conc. in Paddys Run at GMR (ug/l)	7.35E-05
Max. Conc. in GMR (ug/l)	7.72E-06

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.76E-04	3.03E-07	2.10E-05
D-E	7.5	11.3	13.9		1.06E-04	1.16E-07	9.91E-06
E-F	0.6	1.4	1.0	1.1	5.22E-05	5.72E-08	5.80E-06
SSOD				49.2	1.93E-03	2.12E-06	7.77E-05
TOTAL					2.37E-03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.80E-02	4.63E-07	2.28E-07
D-E	1.43E-02	1.74E-07	8.58E-08
E-F	2.56E-03	3.11E-08	1.53E-08
SSOD	6.19E-02	7.53E-07	3.71E-07
TOTAL	1.17E-01	1.42E-06	7.01E-07

CPC SCREENING — BENZO(K)FLUORANTHENE RISK CRITERIA : 2.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.51E-07	YES	2.05E-05	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.74E-07	YES	7.77E-05	YES
Sub570	1.95E-08	YES	1.95E-05	YES	Sub581	3.50E-08	YES	3.50E-05	YES
Sub575	6.57E-09	YES	6.57E-06	YES	Sub582	9.16E-11	YES	9.16E-08	YES

DRAFT

CHEMICAL: BENZO(K)FLUORANTHEN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.81E-01	0.00E+00	2.34E-02	7.65E-03
Single storm adsorbed contaminant quantity PXi (g):	2.63E+00	0.00E+00	1.04E-01	1.70E-02
Annual adsorbed contaminant quantity (g):	1.14E+02	0.00E+00	9.32E-01	2.84E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.51E-07	0.00E+00	1.95E-08	6.57E-09
Single storm dissolved contaminant quantity PQi (g):	1.21E-03	0.00E+00	1.10E-04	2.29E-05
Annual dis. conta. qt (based on sediment yield)(g):	5.22E-02	0.00E+00	9.89E-04	3.83E-04
Annual dis. conta. qt (based on runoff) (g):	1.97E-02	0.00E+00	1.85E-03	3.83E-04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.91E-01	3.66E-02	9.71E-05
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.51E+00	3.18E+00	9.28E-04
Annual adsorbed contaminant quantity (g):	0.00E+00	4.98E+00	5.28E+01	2.40E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.74E-07	3.50E-08	9.16E-11
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.48E-03	4.45E-04	9.55E-07
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.15E-02	7.40E-03	2.47E-05
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.78E-02	7.40E-03	1.64E-05

PADDYS RUN BASIN | CHEMICAL: BENZYL ALCOHOL | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 20:45

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.89E-03	9.12E+00	1.70E+05	2.00E-01	3.79E-04
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	7.53E-03	1.50E+02	7.06E+05	9.28E-01	6.98E-03
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.89E-03	9.12E+00	3.86E-03
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.39E-03	1.50E+02	6.76E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.79E-01	7.73E-04
D-D	3.79E-01	7.73E-04
E-E	3.35E+00	6.66E-03
Max:	3.35E+00	6.66E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.08E-01
Avg. Conc. in GMR (ug/l)	5.33E-02
Max. Conc. in Paddys Run at GMR (ug/l)	2.79E+00
Max. Conc. in GMR (ug/l)	2.93E-01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.88E+00	2.06E-03	1.43E-01
D-E	7.5	11.3	13.9		6.84E-01	7.49E-04	6.39E-02
E-F	0.6	1.4	1.0	1.1	1.71E+00	1.87E-03	1.90E-01
SSOD				49.2	7.40E+01	8.11E-02	2.97E+00
TOTAL					7.83E+01		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	2.79E+02	3.39E-03	1.67E-03
D-E	1.01E+02	1.24E-03	6.09E-04
E-F	6.10E+01	7.43E-04	3.66E-04
SSOD	2.37E+03	2.88E-02	1.42E-02
TOTAL	2.81E+03	3.42E-02	1.69E-02

CPC SCREENING | BENZYL ALCOHOL RISK CRITERIA : 1.10E+03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.89E-03	YES	1.37E-01	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	7.53E-03	YES	2.98E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: BENZYL ALCOHOL Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.86E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.62E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.57E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.89E-03	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	9.12E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.95E+02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.49E+02	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.50E-02	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.19E-01	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	3.91E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.53E-03	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.50E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.96E+02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.49E+03	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** BIS(2-CHLOROISOPROPYL) ETHER | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20:46

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	7.89E-04	4.45E+00	1.99E+05	6.25E-01	4.93E-04
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	3.30E-04	6.60E+00	7.06E+05	9.28E-01	3.07E-04
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	4.92E-04	4.45E+00	1.10E-02
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.49E-04	6.60E+00	2.97E-03

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.92E-01	1.10E-02
D-D	4.92E-01	1.10E-02
E-E	4.92E-01	1.10E-02
Max:	4.92E-01	1.10E-02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.52E-02
Avg. Conc. in GMR (ug/l)	3.69E-03
Max. Conc. in Paddys Run at GMR (ug/l)	4.11E-01
Max. Conc. in GMR (ug/l)	4.32E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.12E+00	1.23E-03	8.54E-02
D-E	7.5	11.3	13.9		5.03E-01	5.51E-04	4.70E-02
E-F	0.6	1.4	1.0	1.1	1.35E-01	1.48E-04	1.50E-02
SSOD				49.2	3.25E+00	3.56E-03	1.31E-01
TOTAL					5.01E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.77E+01	5.81E-04	2.87E-04
D-E	2.14E+01	2.61E-04	1.29E-04
E-F	5.33E+00	6.49E-05	3.20E-05
SSOD	1.04E+02	1.27E-03	6.24E-04
TOTAL	1.78E+02	2.17E-03	1.07E-03

CPC SCREENING BIS(2-CHLOROISOPROPYL) ETHER RISK CRITERIA : 4.20E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	3.30E-04	NO	1.31E-01	NO
Sub570	7.89E-04	NO	8.20E-02	NO	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: BIS(2-CHLOROISOPROPY Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	1.76E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	7.81E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	7.02E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	7.89E-04	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	4.45E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	3.99E+01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	7.45E+01	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.58E-03	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.22E-02	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.72E-01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.30E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	6.60E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.18E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.10E+02	0.00E+00	0.00E+00

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DRAFT 6161

PADDYS RUN BASIN | CHEMICAL: BIS(2-ETHYLHEXYL)PHTHALATE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator: DCW | Date: 5/23/94 20:48

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.53E-24	1.22E-20	1.70E+05	2.00E-01	5.06E-25
WPA	2.58E-25	8.77E-22	1.20E+05	5.09E-01	1.31E-25
Sub570	2.55E-25	1.44E-21	1.99E+05	6.25E-01	1.59E-25
Sub575	2.70E-25	9.42E-22	1.23E+05	2.11E-01	5.71E-26
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	7.28E-25	1.46E-20	7.06E+05	9.28E-01	6.76E-25
Sub581	3.01E-26	3.83E-22	4.49E+05	4.17E-01	1.26E-26
Sub582	2.94E-26	3.06E-22	3.68E+05	2.97E-01	8.73E-27

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.53E-24	1.22E-20	8.25E-20
WPA & sub570	2.56E-25	2.32E-21	8.61E-21
sub575	2.70E-25	9.42E-22	9.07E-21
Sub 580,PDAR, 581 & 582	3.44E-25	1.52E-20	1.08E-20

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.06E-22	1.65E-20
D-D	5.06E-22	1.65E-20
E-E	5.06E-22	1.65E-20
Max:	5.06E-22	1.65E-20

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	9.76E-23
Avg. Conc. in GMR (ug/l)	1.03E-23
Max. Conc. in Paddys Run at GMR (ug/l)	4.23E-22
Max. Conc. in GMR (ug/l)	4.44E-23

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.09E-21	3.39E-24	2.36E-22
D-E	7.5	11.3	13.9		1.31E-21	1.43E-24	1.22E-22
E-F	0.6	1.4	1.0	1.1	2.83E-22	3.10E-25	3.14E-23
SSOD				49.2	7.50E-21	8.22E-24	3.01E-22
TOTAL					1.22E-20		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.97E-19	4.83E-24	2.38E-24
D-E	1.61E-19	1.96E-24	9.64E-25
E-F	1.88E-20	2.29E-25	1.13E-25
SSOD	2.43E-19	2.95E-24	1.46E-24
TOTAL	8.19E-19	9.97E-24	4.92E-24

CPC SCREENING | BIS(2-ETHYLHEXYL)PHTHALATE RISK CRITERIA : 6.10E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.53E-24	YES	2.37E-22	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	2.58E-25	YES	2.37E-22	YES	PDAR	7.28E-25	YES	3.01E-22	YES
Sub570	2.55E-25	YES	2.37E-22	YES	Sub581	3.01E-26	YES	3.01E-23	YES
Sub575	2.70E-25	YES	2.37E-22	YES	Sub582	2.94E-26	YES	2.94E-23	YES

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DRAFT

CHEMICAL: BIS(2-ETHYLHEXYL)PHTH Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.25E-20	8.10E-21	8.91E-21	9.07E-21
Single storm adsorbed contaminant quantity PXi (g):	7.72E-19	3.41E-20	3.96E-20	2.01E-20
Annual adsorbed contaminant quantity (g):	3.34E-17	2.59E-19	3.56E-19	3.36E-19
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.53E-24	2.58E-25	2.55E-25	2.70E-25
Single storm dissolved contaminant quantity PQi (g):	1.22E-20	8.77E-22	1.44E-21	9.42E-22
Annual dis. conta. qt (based on sediment yield)(g):	5.27E-19	6.66E-21	1.29E-20	1.57E-20
Annual dis. conta. qt (based on runoff) (g):	1.99E-19	1.46E-20	2.41E-20	1.57E-20

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.30E-20	9.07E-22	8.74E-22
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.82E-19	7.89E-20	8.36E-21
Annual adsorbed contaminant quantity (g):	0.00E+00	6.00E-19	1.31E-18	2.16E-19
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.28E-25	3.01E-26	2.94E-26
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.46E-20	3.83E-22	3.06E-22
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.80E-20	6.37E-21	7.91E-21
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.41E-19	6.37E-21	5.25E-21

DRAFT

PADDYS RUN BASIN | CHEMICAL: CARBAZOLE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 21:06

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	9.85E-05	3.35E-01	1.20E+05	5.09E-01	5.01E-05
Sub570	2.59E-05	1.46E-01	1.99E+05	6.25E-01	1.62E-05
Sub575	1.61E-05	5.62E-02	1.23E+05	2.11E-01	3.41E-06
Sub580	1.97E-05	2.42E-02	4.34E+04	4.40E-02	8.68E-07
PDAR	4.14E-04	8.27E+00	7.06E+05	9.28E-01	3.84E-04
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	5.32E-05	4.81E-01	1.68E-02
sub575	1.61E-05	5.62E-02	5.29E-03
Sub 580,PDAR, 581 & 582	1.87E-04	8.30E+00	5.77E-02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	5.32E-02	1.68E-02
D-D	5.32E-02	1.68E-02
E-E	1.85E-01	5.71E-02
Max:	1.85E-01	5.71E-02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.81E-02
Avg. Conc. in GMR (ug/l)	2.95E-03
Max. Conc. in Paddys Run at GMR (ug/l)	1.55E-01
Max. Conc. in GMR (ug/l)	1.62E-02

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.21E-01	1.33E-04	9.23E-03
D-E	7.5	11.3	13.9		6.21E-02	6.81E-05	5.81E-03
E-F	0.6	1.4	1.0	1.1	9.86E-02	1.08E-04	1.09E-02
SSOD				49.2	4.08E+00	4.47E-03	1.64E-01
TOTAL					4.36E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	5.14E+00	6.26E-05	3.09E-05
D-E	3.14E+00	3.82E-05	1.88E-05
E-F	3.30E+00	4.02E-05	1.98E-05
SSOD	1.31E+02	1.59E-03	7.84E-04
TOTAL	1.42E+02	1.73E-03	8.53E-04

CPC SCREENING | CARBAZOLE RISK CRITERIA : 4.30E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	1.97E-05	YES	1.97E-02	YES
WPA	9.85E-05	YES	9.50E-03	YES	PDAR	4.14E-04	YES	1.64E-01	YES
Sub570	2.59E-05	YES	9.50E-03	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	1.61E-05	YES	9.50E-03	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: CARBAZOLE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.02E-02	8.70E-03	5.29E-03
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.27E-01	3.86E-02	1.17E-02
Annual adsorbed contaminant quantity (g):	0.00E+00	9.65E-01	3.47E-01	1.96E-01
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	9.85E-05	2.59E-05	1.61E-05
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.35E-01	1.46E-01	5.62E-02
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.54E+00	1.31E+00	9.40E-01
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.58E+00	2.45E+00	9.40E-01

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.91E-03	1.28E-01	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.52E-02	1.01E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	5.48E-01	3.33E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.97E-05	4.14E-04	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.42E-02	8.27E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.77E-01	2.73E+01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.98E-01	1.37E+02	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** CHRYSENE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 20.50

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.49E-07	2.16E-03	1.70E+05	2.00E-01	8.97E-08
WPA	8.32E-09	2.83E-05	1.20E+05	5.09E-01	4.23E-09
Sub570	3.84E-08	2.17E-04	1.99E+05	6.25E-01	2.40E-08
Sub575	1.30E-08	4.54E-05	1.23E+05	2.11E-01	2.75E-09
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	2.27E-07	4.54E-03	7.06E+05	9.28E-01	2.11E-07
Sub581	2.76E-08	3.51E-04	4.49E+05	4.17E-01	1.15E-08
Sub582	3.27E-10	3.40E-06	3.68E+05	2.97E-01	9.70E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.49E-07	2.16E-03	2.91E-02
WPA & sub570	2.71E-08	2.45E-04	1.86E-03
sub575	1.30E-08	4.54E-05	8.76E-04
Sub 580,PDAR, 581 & 582	1.10E-07	4.89E-03	6.96E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.97E-05	5.82E-03
D-D	8.97E-05	5.82E-03
E-E	1.10E-04	6.94E-03
Max:	1.10E-04	6.94E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.34E-05
Avg. Conc. in GMR (ug/l)	2.45E-06
Max. Conc. in Paddys Run at GMR (ug/l)	9.18E-05
Max. Conc. in GMR (ug/l)	9.65E-06

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.07E-04	5.55E-07	3.86E-05
D-E	7.5	11.3	13.9		1.96E-04	2.15E-07	1.83E-05
E-F	0.6	1.4	1.0	1.1	7.07E-05	7.74E-08	7.85E-06
SSOD				49.2	2.41E-03	2.64E-06	9.67E-05
TOTAL					3.18E-03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.86E-02	8.35E-07	4.12E-07
D-E	2.59E-02	3.15E-07	1.55E-07
E-F	3.86E-03	4.70E-08	2.32E-08
SSOD	7.70E-02	9.38E-07	4.62E-07
TOTAL	1.75E-01	2.14E-06	1.05E-06

CPC SCREENING **CHRYSENE RISK CRITERIA :** 2.70E-01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.49E-07	YES	3.76E-05	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	8.32E-09	YES	8.32E-06	YES	PDAR	2.27E-07	YES	9.67E-05	YES
Sub570	3.84E-08	YES	3.76E-05	YES	Sub581	2.76E-08	YES	2.76E-05	YES
Sub575	1.30E-08	YES	1.30E-05	YES	Sub582	3.27E-10	YES	3.27E-07	YES

DRAFT

CHEMICAL: CHRYSENE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.91E-02	5.23E-04	2.66E-03	8.76E-04
Single storm adsorbed contaminant quantity PXi (g):	2.72E-01	2.20E-03	1.18E-02	1.94E-03
Annual adsorbed contaminant quantity (g):	1.18E+01	1.67E-02	1.06E-01	3.25E-02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.49E-07	8.32E-09	3.84E-08	1.30E-08
Single storm dissolved contaminant quantity PQi (g):	2.16E-03	2.83E-05	2.17E-04	4.54E-05
Annual dis. conta. qt (based on sediment yield)(g):	9.35E-02	2.14E-04	1.95E-03	7.59E-04
Annual dis. conta. qt (based on runoff) (g):	3.53E-02	4.71E-04	3.63E-03	7.59E-04

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.44E-02	1.66E-03	2.00E-05
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.14E-01	1.45E-01	1.91E-04
Annual adsorbed contaminant quantity (g):	0.00E+00	3.75E-01	2.41E+00	4.94E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.27E-07	2.76E-08	3.27E-10
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.54E-03	3.51E-04	3.40E-06
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.50E-02	5.83E-03	8.79E-05
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	7.53E-02	5.83E-03	5.83E-05

PADDYS RUN BASIN | CHEMICAL: DIBENZO(A,H)ANTHRACENE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20 52

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.12E-08	1.98E-04	1.70E+05	2.00E-01	8.24E-09
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	7.09E-10	3.99E-06	1.99E+05	6.25E-01	4.43E-10
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	3.04E-08	6.08E-04	7.06E+05	9.28E-01	2.82E-08
Sub581	6.21E-09	7.89E-05	4.49E+05	4.17E-01	2.59E-09
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.12E-08	1.98E-04	6.23E-03
WPA & sub570	4.42E-10	3.99E-06	7.10E-05
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.55E-08	6.87E-04	2.27E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	8.24E-06	1.25E-03
D-D	8.24E-06	1.25E-03
E-E	1.54E-05	2.26E-03
Max:	1.54E-05	2.26E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.83E-06
Avg. Conc. in GMR (ug/l)	2.97E-07
Max. Conc. in Paddys Run at GMR (ug/l)	1.28E-05
Max. Conc. in GMR (ug/l)	1.35E-06

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.19E-05	4.59E-08	3.19E-06
D-E	7.5	11.3	13.9		1.53E-05	1.68E-08	1.43E-06
E-F	0.6	1.4	1.0	1.1	8.80E-06	9.64E-09	9.78E-07
SSOD				49.2	3.38E-04	3.70E-07	1.36E-05
TOTAL					4.04E-04		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.10E-03	7.43E-08	3.66E-08
D-E	2.23E-03	2.71E-08	1.34E-08
E-F	4.21E-04	5.12E-09	2.53E-09
SSOD	1.08E-02	1.32E-07	6.49E-08
TOTAL	1.96E-02	2.38E-07	1.17E-07

CPC SCREENING DIBENZO(A,H)ANTHRACENE RISK CRITERIA : 1.10E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.12E-08	YES	3.06E-06	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	3.04E-08	YES	1.36E-05	YES
Sub570	7.09E-10	YES	7.09E-07	YES	Sub581	6.21E-09	YES	6.21E-06	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: DIBENZO(A,H)ANTHRACE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	6.23E-03	0.00E+00	1.14E-04	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	5.83E-02	0.00E+00	5.06E-04	0.00E+00
Annual adsorbed contaminant quantity (g):	2.52E+00	0.00E+00	4.54E-03	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.12E-08	0.00E+00	7.09E-10	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.98E-04	0.00E+00	3.99E-06	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	8.58E-03	0.00E+00	3.59E-05	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	3.24E-03	0.00E+00	6.69E-05	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.49E-03	8.74E-04	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.56E-02	7.60E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.17E-01	1.26E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.04E-08	6.21E-09	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	6.08E-04	7.89E-05	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.00E-03	1.31E-03	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.01E-02	1.31E-03	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: DIBENZOFURAN | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 20:53

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.80E-74	3.27E-70	1.70E+05	2.00E-01	1.36E-74
WPA	9.98E-73	3.39E-69	1.20E+05	5.09E-01	5.08E-73
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.88E-73	3.77E-69	7.06E+05	9.28E-01	1.75E-73
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.80E-74	3.27E-70	1.45E-70
WPA & sub570	3.76E-73	3.39E-69	7.80E-70
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	8.49E-74	3.77E-69	1.77E-70

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.76E-70	7.80E-70
D-D	3.76E-70	7.80E-70
E-E	3.76E-70	7.80E-70
Max:	3.76E-70	7.80E-70

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.38E-71
Avg. Conc. in GMR (ug/l)	2.50E-72
Max. Conc. in Paddys Run at GMR (ug/l)	3.14E-70
Max. Conc. in GMR (ug/l)	3.29E-71

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			9.22E-70	1.01E-72	7.03E-71
D-E	7.5	11.3	13.9		4.08E-70	4.47E-73	3.81E-71
E-F	0.6	1.4	1.0	1.1	9.09E-71	9.96E-74	1.01E-71
SSOD				49.2	1.85E-69	2.03E-72	7.44E-71
TOTAL					3.27E-69		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.62E-68	5.63E-73	2.78E-73
D-E	1.99E-68	2.42E-73	1.19E-73
E-F	3.90E-69	4.75E-74	2.34E-74
SSOD	5.92E-68	7.21E-73	3.56E-73
TOTAL	1.29E-67	1.57E-72	7.76E-73

CPC SCREENING | DIBENZOFURAN RISK CRITERIA : 1.50E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.80E-74	YES	6.75E-71	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	9.98E-73	YES	6.75E-71	YES	PDAR	1.88E-73	YES	7.44E-71	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: DIBENZOFURAN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.45E-70	2.07E-69	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.36E-69	8.73E-69	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	5.89E-68	6.62E-68	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.80E-74	9.98E-73	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.27E-70	3.39E-69	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.42E-68	2.57E-68	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	5.34E-69	5.66E-68	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.93E-70	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.12E-69	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.03E-68	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.88E-73	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.77E-69	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.24E-68	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.24E-68	0.00E+00	0.00E+00

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DRAFT

PADDYS RUN BASIN | **CHEMICAL:** HEXACHLOROBUTADIENE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 20:55

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	6.42E-27	1.28E-22	7.06E+05	9.28E-01	5.96E-27
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.90E-27	1.28E-22	2.76E-23

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	2.85E-24	2.72E-23
Max:	2.85E-24	2.72E-23

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.09E-25
Avg. Conc. in GMR (ug/l)	4.29E-26
Max. Conc. in Paddys Run at GMR (ug/l)	2.38E-24
Max. Conc. in GMR (ug/l)	2.50E-25

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.41E-24	1.55E-27	1.57E-25
SSOD				49.2	6.32E-23	6.92E-26	2.54E-24
TOTAL					6.46E-23		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	4.52E-23	5.50E-28	2.71E-28
SSOD	2.02E-21	2.46E-26	1.21E-26
TOTAL	2.07E-21	2.51E-26	1.24E-26

CPC SCREENING **HEXACHLOROBUTADIENE RISK CRITERIA :** 2.30E-02 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	6.42E-27	YES	2.54E-24	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

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DRAFT

CHEMICAL: HEXACHLOROBUTADIEN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	6.12E-23	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	4.85E-22	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.60E-21	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.42E-27	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.28E-22	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.23E-22	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.13E-21	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** INDENO(1,2,3-CD)PYRENE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 20:57

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	4.51E-10	2.17E-06	1.70E+05	2.00E-01	9.03E-11
WPA	7.79E-12	2.65E-08	1.20E+05	5.09E-01	3.97E-12
Sub570	2.49E-11	1.40E-07	1.99E+05	6.25E-01	1.55E-11
Sub575	1.08E-11	3.78E-08	1.23E+05	2.11E-01	2.29E-12
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	3.53E-10	7.07E-06	7.06E+05	9.28E-01	3.28E-10
Sub581	1.03E-10	1.30E-06	4.49E+05	4.17E-01	4.28E-11
Sub582	2.36E-13	2.46E-09	3.68E+05	2.97E-01	7.01E-14

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	4.51E-10	2.17E-06	3.34E-03
WPA & sub570	1.85E-11	1.67E-07	1.43E-04
sub575	1.08E-11	3.78E-08	8.33E-05
Sub 580,PDAR, 581 & 582	1.89E-10	8.37E-06	1.35E-03

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	9.03E-08	6.69E-04
D-D	9.03E-08	6.69E-04
E-E	1.87E-07	1.34E-03
Max:	1.87E-07	1.34E-03

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.42E-08
Avg. Conc. in GMR (ug/l)	3.59E-09
Max. Conc. in Paddys Run at GMR (ug/l)	1.56E-07
Max. Conc. in GMR (ug/l)	1.64E-08

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.90E-07	5.37E-10	3.73E-08
D-E	7.5	11.3	13.9		1.87E-07	2.05E-10	1.75E-08
E-F	0.6	1.4	1.0	1.1	1.08E-07	1.18E-10	1.20E-08
SSOD				49.2	4.12E-06	4.51E-09	1.66E-07
TOTAL					4.90E-06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	6.82E-05	8.30E-10	4.09E-10
D-E	2.55E-05	3.11E-10	1.53E-10
E-F	5.03E-06	6.13E-11	3.02E-11
SSOD	1.32E-04	1.60E-09	7.91E-10
TOTAL	2.31E-04	2.81E-09	1.38E-09

CPC SCREENING | **INDENO(1,2,3-CD)PYRENE RISK CRITERIA :** 4.30E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	4.51E-10	YES	3.63E-08	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	7.79E-12	YES	7.79E-09	YES	PDAR	3.53E-10	YES	1.66E-07	YES
Sub570	2.49E-11	YES	2.49E-08	YES	Sub581	1.03E-10	YES	1.03E-07	YES
Sub575	1.08E-11	YES	1.08E-08	YES	Sub582	2.36E-13	YES	2.36E-10	YES

DRAFT

CHEMICAL: INDENO(1,2,3-CD)PYREN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.34E-03	5.60E-05	1.96E-04	8.33E-05
Single storm adsorbed contaminant quantity PXi (g):	3.13E-02	2.36E-04	8.70E-04	1.85E-04
Annual adsorbed contaminant quantity (g):	1.35E+00	1.79E-03	7.81E-03	3.09E-03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	4.51E-10	7.79E-12	2.49E-11	1.08E-11
Single storm dissolved contaminant quantity PQi (g):	2.17E-06	2.65E-08	1.40E-07	3.78E-08
Annual dis. conta. qt (based on sediment yield)(g):	9.41E-05	2.01E-07	1.26E-06	6.31E-07
Annual dis. conta. qt (based on runoff) (g):	3.55E-05	4.42E-07	2.35E-06	6.31E-07

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.55E-03	7.07E-04	1.65E-06
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.02E-02	6.15E-02	1.58E-05
Annual adsorbed contaminant quantity (g):	0.00E+00	6.67E-02	1.02E+00	4.08E-04
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	3.53E-10	1.03E-10	2.36E-13
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	7.07E-06	1.30E-06	2.46E-09
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.33E-05	2.17E-05	6.35E-08
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.17E-04	2.17E-05	4.21E-08

DRAFT

PADDYS RUN BASIN | CHEMICAL: ISOPHORONE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 20:59

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	6.30E-141	1.26E-136	7.06E+05	9.28E-01	5.84E-141
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.84E-141	1.26E-136	2.25E-140

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	2.79E-138	2.21E-140
Max:	2.79E-138	2.21E-140

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.00E-139
Avg. Conc. in GMR (ug/l)	4.20E-140
Max. Conc. in Paddys Run at GMR (ug/l)	2.33E-138
Max. Conc. in GMR (ug/l)	2.45E-139

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	##########	1.52E-141	1.54E-139
SSOD				49.2	##########	6.79E-140	2.49E-138
TOTAL					##########		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	4.43E-137	5.39E-142	2.66E-142
SSOD	1.98E-135	2.41E-140	1.19E-140
TOTAL	2.02E-135	2.46E-140	1.22E-140

CPC SCREENING | ISOPHORONE RISK CRITERIA : 9.00E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	6.30E-141	YES	##########	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: ISOPHORONE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.99E-140	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.95E-139	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.30E-138	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.30E-141	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.26E-136	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.15E-136	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.09E-135	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: N-NITROSO-DI-N-PROPYLAMINE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS:

Investigator DCW Date 5/23/94 21:01

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	6.04E-25	2.91E-21	1.70E+05	2.00E-01	1.21E-25
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	0.00E+00	0.00E+00	7.06E+05	9.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	6.04E-25	2.91E-21	3.04E-24
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.21E-22	6.07E-25
D-D	1.21E-22	6.07E-25
E-E	1.21E-22	6.07E-25
Max:	1.21E-22	6.07E-25

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	9.26E-24
Avg. Conc. in GMR (ug/l)	9.72E-25
Max. Conc. in Paddys Run at GMR (ug/l)	1.01E-22
Max. Conc. in GMR (ug/l)	1.06E-23

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			5.99E-22	6.57E-25	4.57E-23
D-E	7.5	11.3	13.9		2.18E-22	2.39E-25	2.04E-23
E-F	0.6	1.4	1.0	1.1	1.75E-23	1.91E-26	1.94E-24
SSOD				49.2	0.00E+00	0.00E+00	0.00E+00
TOTAL					8.35E-22		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	8.89E-20	1.08E-24	5.34E-25
D-E	3.24E-20	3.94E-25	1.94E-25
E-F	2.59E-21	3.15E-26	1.55E-26
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	1.24E-19	1.51E-24	7.44E-25

CPC SCREENING

N-NITROSO-DI-N-PROPYLAMINE RISK CRITERIA : 1.20E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	6.04E-25	YES	4.39E-23	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: N-NITROSO-DI-N-PROPYL Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.04E-24	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.84E-23	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.23E-21	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	6.04E-25	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	2.91E-21	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.26E-19	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	4.75E-20	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** N-NITROSODIPHENYLAMINE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 21:02

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	4.73E-117	9.46E-113	7.06E+05	9.28E-01	4.39E-117
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.13E-117	9.46E-113	4.56E-115

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	2.10E-114	4.49E-115
Max:	2.10E-114	4.49E-115

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	3.01E-115
Avg. Conc. in GMR (ug/l)	3.16E-116
Max. Conc. in Paddys Run at GMR (ug/l)	1.75E-114
Max. Conc. in GMR (ug/l)	1.84E-115

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	##########	1.14E-117	1.16E-115
SSOD				49.2	##########	5.10E-116	1.87E-114
TOTAL					##########		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	3.33E-113	4.05E-118	2.00E-118
SSOD	1.49E-111	1.81E-116	8.94E-117
TOTAL	1.52E-111	1.85E-116	9.14E-117

CPC SCREENING | **N-NITROSODIPHENYLAMINE RISK CRITERIA :** 1.70E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	4.73E-117	YES	##########	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: N-NITROSODIPHENYLAMI Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.01E-114	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	8.01E-114	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.64E-113	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.73E-117	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	9.46E-113	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	3.12E-112	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.57E-111	0.00E+00	0.00E+00

DRAFT 4-616

PADDYS RUN BASIN	CHEMICAL: TRIBUTYL PHOSPHATE	SCENARIO: WITHOUT STORMWATER CONTROLS Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 21:04

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	8.90E-06	4.28E-02	1.70E+05	2.00E-01	1.78E-06
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	5.11E-06	2.88E-02	1.99E+05	6.25E-01	3.19E-06
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.82E-04	3.64E+00	7.06E+05	9.28E-01	1.69E-04
Sub581	2.10E-05	2.67E-01	4.49E+05	4.17E-01	8.77E-06
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	8.90E-06	4.28E-02	1.44E-02
WPA & sub570	3.19E-06	2.88E-02	5.49E-03
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580.PDAR, 581 & 582	8.80E-05	3.90E+00	1.39E-01

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	3.19E-03	5.49E-03
D-D	3.19E-03	5.49E-03
E-E	8.67E-02	1.37E-01
Max:	8.67E-02	1.37E-01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.26E-02
Avg. Conc. in GMR (ug/l)	1.33E-03
Max. Conc. in Paddys Run at GMR (ug/l)	7.24E-02
Max. Conc. in GMR (ug/l)	7.61E-03

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.61E-02	1.76E-05	1.23E-03
D-E	7.5	11.3	13.9		6.47E-03	7.08E-06	6.04E-04
E-F	0.6	1.4	1.0	1.1	4.36E-02	4.78E-05	4.84E-03
SSOD				49.2	1.92E+00	2.10E-03	7.72E-02
TOTAL					1.99E+00		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.62E+00	1.97E-05	9.71E-06
D-E	6.15E-01	7.49E-06	3.69E-06
E-F	1.43E+00	1.74E-05	8.59E-06
SSOD	6.14E+01	7.48E-04	3.69E-04
TOTAL	6.51E+01	7.93E-04	3.91E-04

CPC SCREENING TRIBUTYL PHOSPHATE RISK CRITERIA : 1.80E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	8.90E-06	YES	1.18E-03	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.82E-04	YES	7.72E-02	YES
Sub570	5.11E-06	YES	1.18E-03	YES	Sub581	2.10E-05	YES	2.10E-02	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: TRIBUTYL PHOSPHATE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.44E-02	0.00E+00	8.79E-03	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.35E-01	0.00E+00	3.91E-02	0.00E+00
Annual adsorbed contaminant quantity (g):	5.83E+00	0.00E+00	3.51E-01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	8.90E-06	0.00E+00	5.11E-06	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	4.28E-02	0.00E+00	2.88E-02	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.85E+00	0.00E+00	2.59E-01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	7.00E-01	0.00E+00	4.83E-01	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.88E-01	3.16E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.28E+00	2.75E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	7.51E+00	4.57E+01	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.82E-04	2.10E-05	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.64E+00	2.67E-01	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.20E+01	4.44E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.03E+01	4.44E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: ALDRIN | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 21:38

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.61E-15	3.21E-11	7.06E+05	9.28E-01	1.49E-15
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	7.25E-16	3.21E-11	1.48E-11

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	7.14E-13	1.45E-11
Max:	7.14E-13	1.45E-11

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.02E-13
Avg. Conc. in GMR (ug/l)	1.07E-14
Max. Conc. in Paddys Run at GMR (ug/l)	5.96E-13
Max. Conc. in GMR (ug/l)	6.26E-14

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	3.54E-13	3.87E-16	3.93E-14
SSOD				49.2	1.58E-11	1.73E-14	6.35E-13
TOTAL					1.62E-11		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	1.13E-11	1.38E-16	6.79E-17
SSOD	5.06E-10	6.16E-15	3.04E-15
TOTAL	5.17E-10	6.29E-15	3.10E-15

CPC SCREENING | ALDRIN RISK CRITERIA : 5.00E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.61E-15	YES	6.36E-13	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: ALDRIN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	3.28E-11	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	2.60E-10	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	8.55E-10	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.61E-15	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	3.21E-11	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.06E-10	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	5.33E-10	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: ALPHA-CHLORDANE | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 21 39

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	7.77E-06	1.55E-01	7.06E+05	9.28E-01	7.21E-06
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	3.50E-06	1.55E-01	3.34E-04

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	3.45E-03	3.29E-04
Max:	3.45E-03	3.29E-04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.94E-04
Avg. Conc. in GMR (ug/l)	5.19E-05
Max. Conc. in Paddys Run at GMR (ug/l)	2.88E-03
Max. Conc. in GMR (ug/l)	3.02E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub580	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.71E-03	1.87E-06	1.90E-04
SSOD				49.2	7.64E-02	8.37E-05	3.07E-03
TOTAL					7.81E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	5.46E-02	6.65E-07	3.28E-07
SSOD	2.44E+00	2.98E-05	1.47E-05
TOTAL	2.50E+00	3.04E-05	1.50E-05

CPC SCREENING | ALPHA-CHLORDANE RISK CRITERIA : 6.60E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	7.77E-06	NO	3.07E-03	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: ALPHA-CHLORDANE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	7.41E-04	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	5.87E-03	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.93E-02	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	7.77E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.55E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	5.12E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.58E+00	0.00E+00	0.00E+00

PADDYS RUN BASIN | CHEMICAL: AROCLOR-1254 | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/23/94 21 41

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.14E-06	1.03E-02	1.70E+05	2.00E-01	4.29E-07
WPA	2.87E-07	9.76E-04	1.20E+05	5.09E-01	1.46E-07
Sub570	3.43E-07	1.93E-03	1.99E+05	6.25E-01	2.15E-07
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.24E-05	2.47E-01	7.06E+05	9.28E-01	1.15E-05
Sub581	1.04E-06	1.32E-02	4.49E+05	4.17E-01	4.33E-07
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.14E-06	1.03E-02	3.72E-01
WPA & sub570	3.22E-07	2.91E-03	5.81E-02
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	5.87E-06	2.60E-01	9.91E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.29E-04	7.43E-02
D-D	4.29E-04	7.43E-02
E-E	5.79E-03	9.78E-01
Max:	5.79E-03	9.78E-01

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of inf. vol. from Sub560	% of inf. vol. from WPA & Sub570	% of inf. vol. from Sub575	% of inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			2.86E-03	3.13E-06	2.18E-04
D-E	7.5	11.3	13.9		1.10E-03	1.21E-06	1.03E-04
E-F	0.6	1.4	1.0	1.1	2.97E-03	3.25E-06	3.30E-04
SSOD				49.2	1.28E-01	1.40E-04	5.15E-03
TOTAL					1.35E-01		

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	8.71E-04
Avg. Conc. in GMR (ug/l)	9.14E-05
Max. Conc. in Paddys Run at GMR (ug/l)	4.83E-03
Max. Conc. in GMR (ug/l)	5.08E-04

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.46E-01	4.22E-06	2.08E-06
D-E	1.29E-01	1.57E-06	7.73E-07
E-F	1.03E-01	1.25E-06	6.17E-07
SSOD	4.10E+00	4.99E-05	2.46E-05
TOTAL	4.68E+00	5.69E-05	2.81E-05

CPC SCREENING | AROCLOR-1254 RISK CRITERIA : 1.10E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.14E-06	NO	2.09E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	2.87E-07	YES	2.09E-04	YES	PDAR	1.24E-05	NO	5.15E-03	NO
Sub570	3.43E-07	YES	2.09E-04	YES	Sub581	1.04E-06	YES	1.04E-03	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

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CHEMICAL: AROCLOR-1254 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	3.72E-01	4.83E-02	6.40E-02	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	3.48E+00	2.04E-01	2.84E-01	0.00E+00
Annual adsorbed contaminant quantity (g):	1.51E+02	1.54E+00	2.55E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.14E-06	2.87E-07	3.43E-07	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.03E-02	9.76E-04	1.93E-03	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	4.46E-01	7.41E-03	1.74E-02	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.68E-01	1.63E-02	3.24E-02	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.09E+00	1.68E-01	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.66E+01	1.46E+01	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.46E+01	2.42E+02	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.24E-05	1.04E-06	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.47E-01	1.32E-02	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	8.14E-01	2.20E-01	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	4.10E+00	2.20E-01	0.00E+00

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investigator DCW

COC= AROCLOR-1254
Risk Criteria (ug/l) 1.10E-03

AREA	Kd (l/Kg)	Concentration (mg/kg)	comment Future
560A	6.07E+03	0	
560B	5.99E+03	2.1	
560C	6.07E+03	0.045	
SWL	5.93E+03	0	
560D	5.93E+03	0	
570A	6.09E+03	0	
570B	6.20E+03	0.12	
570C	5.93E+03	0.24	
570D	5.93E+03	0.24	
570E	6.20E+03	0	
575A	6.07E+03	0	
575B	6.20E+03	0	
SF	5.93E+03	0	
580A	6.07E+03	0	
581A	5.93E+03	0.2	
581B	5.93E+03	0.12	
581C	5.77E+03	0	
581D	5.93E+03	0	
582A	5.77E+03	0	
582B	5.93E+03	0	
AFP	5.93E+03	0	
PAA	5.93E+03	1.1	
PAB	5.93E+03	2.3	
PAC	5.93E+03	14	
PAD	5.93E+03	10	
PAE	5.93E+03	0.46	
PAF	5.93E+03	0.054	
PAG	5.93E+03	2.4	
PAH	5.93E+03	1.1	
PAI	5.93E+03	0	
LSP	5.93E+03	0	
WPAA	5.93E+03	0.12	
WPA.OU1	5.93E+03	0	
WPA.OU4	5.93E+03	0	

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PADDYS RUN BASIN | **CHEMICAL:** AROCLOR-1260 | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/23/94 21:43

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.74E-08	3.73E-04	1.70E+05	2.00E-01	1.55E-08
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	4.04E-06	8.07E-02	7.06E+05	9.28E-01	3.75E-06
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	7.74E-08	3.73E-04	1.64E-02
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	1.82E-06	8.07E-02	3.71E-01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.55E-05	3.28E-03
D-D	1.55E-05	3.28E-03
E-E	1.79E-03	3.66E-01
Max:	1.79E-03	3.66E-01

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	2.58E-04
Avg. Conc. in GMR (ug/l)	2.71E-05
Max. Conc. in Paddys Run at GMR (ug/l)	1.50E-03
Max. Conc. in GMR (ug/l)	1.57E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.68E-05	8.41E-08	5.85E-06
D-E	7.5	11.3	13.9		2.80E-05	3.06E-08	2.61E-06
E-F	0.6	1.4	1.0	1.1	8.90E-04	9.75E-07	9.88E-05
SSOD				49.2	3.97E-02	4.35E-05	1.60E-03
TOTAL					4.07E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.14E-02	1.39E-07	6.84E-08
D-E	4.15E-03	5.05E-08	2.49E-08
E-F	2.87E-02	3.50E-07	1.72E-07
SSOD	1.27E+00	1.55E-05	7.62E-06
TOTAL	1.31E+00	1.60E-05	7.89E-06

CPC SCREENING | **AROCLOR-1260 RISK CRITERIA :** 1.10E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.74E-08	YES	5.62E-06	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	4.04E-06	NO	1.60E-03	NO
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: AROCLOR-1260 Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.64E-02	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	1.54E-01	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	6.65E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.74E-08	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.73E-04	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.61E-02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	6.09E-03	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	8.24E-01	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	6.53E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.15E+01	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	4.04E-06	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	8.07E-02	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	2.66E-01	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	1.34E+00	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** BETA-BHC | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date. 5/23/94 21:45

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	2.05E-36	4.10E-32	7.06E+05	9.28E-01	1.90E-36
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	9.24E-37	4.10E-32	9.22E-34

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	9.10E-34	9.08E-34
Max:	9.10E-34	9.08E-34

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.30E-34
Avg. Conc. in GMR (ug/l)	1.37E-35
Max. Conc. in Paddys Run at GMR (ug/l)	7.60E-34
Max. Conc. in GMR (ug/l)	7.98E-35

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	4.51E-34	4.94E-37	5.01E-35
SSOD				49.2	2.02E-32	2.21E-35	8.10E-34
TOTAL					2.06E-32		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	1.44E-32	1.76E-37	8.66E-38
SSOD	6.45E-31	7.85E-36	3.87E-36
TOTAL	6.59E-31	8.03E-36	3.96E-36

CPC SCREENING | **BETA-BHC RISK CRITERIA :** 4.70E-03 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	2.05E-36	YES	8.10E-34	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: BETA-BHC *Future*

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	2.05E-33	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	1.62E-32	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	5.34E-32	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.05E-36	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.10E-32	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.35E-31	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	6.80E-31	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | CHEMICAL: DIELDRIN | SCENARIO: WITHOUT STORMWATER CONTROLS

Future

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date 5/23/94 21:47

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	2.41E-09	1.16E-05	1.70E+05	2.00E-01	4.81E-10
WPA	1.15E-09	3.91E-06	1.20E+05	5.09E-01	5.85E-10
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	2.19E-10	4.38E-06	7.06E+05	9.28E-01	2.04E-10
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	2.41E-09	1.16E-05	4.86E-06
WPA & sub570	4.33E-10	3.91E-06	8.37E-07
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	9.88E-11	4.38E-06	1.92E-07

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.81E-07	9.72E-07
D-D	4.81E-07	9.72E-07
E-E	4.81E-07	9.72E-07
Max:	4.81E-07	9.72E-07

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.32E-08
Avg. Conc. in GMR (ug/l)	6.64E-09
Max. Conc. in Paddys Run at GMR (ug/l)	4.02E-07
Max. Conc. in GMR (ug/l)	4.22E-08

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			3.37E-06	3.69E-09	2.57E-0[illegible]
D-E	7.5	11.3	13.9		1.31E-06	1.44E-09	1.22E-07
E-F	0.6	1.4	1.0	1.1	1.72E-07	1.89E-10	1.92E-08
SSOD				49.2	2.16E-06	2.36E-09	8.67E-08
TOTAL					7.01E-06		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.96E-04	4.82E-09	2.38E-09
D-E	1.48E-04	1.80E-09	8.86E-10
E-F	1.45E-05	1.76E-10	8.69E-11
SSOD	6.90E-05	8.40E-10	4.14E-10
TOTAL	6.27E-04	7.63E-09	3.76E-09

CPC SCREENING | DIELDRIN RISK CRITERIA : 5.30E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	2.41E-09	YES	2.47E-07	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	1.15E-09	YES	2.47E-07	YES	PDAR	2.19E-10	YES	8.67E-08	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: DIELDRIN Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.86E-06	2.23E-06	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	4.55E-05	9.37E-06	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.97E-03	7.11E-05	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	2.41E-09	1.15E-09	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	1.16E-05	3.91E-06	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	5.01E-04	2.97E-05	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	1.89E-04	6.52E-05	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.27E-07	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.38E-06	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.11E-05	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	2.19E-10	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	4.38E-06	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	1.44E-05	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	7.27E-05	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** HEPTACHLORODIBENZOFURANS | **SCENARIO: WITHOUT STORMWATER CONTROLS**

FUTURE

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 5/24/94 10:01

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	7.85E-80	3.78E-76	1.70E+05	2.00E-01	1.57E-80
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	1.06E-78	2.12E-74	7.06E+05	9.28E-01	9.85E-79
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	7.85E-80	3.78E-76	8.33E-75
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	4.78E-79	2.12E-74	5.00E-74

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	1.57E-77	1.67E-75
D-D	1.57E-77	1.67E-75
E-E	4.71E-76	4.93E-74
Max:	4.71E-76	4.93E-74

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	6.87E-77
Avg. Conc. in GMR (ug/l)	7.21E-78
Max. Conc. in Paddys Run at GMR (ug/l)	3.94E-76
Max. Conc. in GMR (ug/l)	4.13E-77

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			7.78E-77	8.53E-80	5.93E-7[illegible]
D-E	7.5	11.3	13.9		2.83E-77	3.10E-80	2.65E-78
E-F	0.6	1.4	1.0	1.1	2.36E-76	2.58E-79	2.62E-77
SSOD				49.2	1.04E-74	1.14E-77	4.19E-76
TOTAL					1.08E-74		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.15E-74	1.41E-79	6.93E-80
D-E	4.20E-75	5.12E-80	2.52E-80
E-F	7.80E-75	9.49E-80	4.68E-80
SSOD	3.34E-73	4.06E-78	2.00E-78
TOTAL	3.57E-73	4.35E-78	2.15E-78

CPC SCREENING **HEPTACHLORODIBENZOFURANS RISK CRITERIA :** 5.70E-06 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	7.85E-80	YES	5.70E-78	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	1.06E-78	YES	4.19E-76	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: HEPTACHLORODIBENZO FUTURE

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	8.33E-75	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	7.79E-74	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	3.37E-72	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	7.85E-80	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	3.78E-76	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.64E-74	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	6.17E-75	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	1.11E-73	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	8.79E-73	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	2.90E-72	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	1.06E-78	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	2.12E-74	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	6.99E-74	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	3.52E-73	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** HEPTACHLOR EPOXIDE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 21:48

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	0.00E+00	0.00E+00	1.70E+05	2.00E-01	0.00E+00
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	6.52E-13	1.30E-08	7.06E+05	9.28E-01	6.05E-13
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	0.00E+00	0.00E+00	0.00E+00
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	2.94E-13	1.30E-08	2.09E-11

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	0.00E+00	0.00E+00
D-D	0.00E+00	0.00E+00
E-E	2.90E-10	2.06E-11
Max:	2.90E-10	2.06E-11

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	4.15E-11
Avg. Conc. in GMR (ug/l)	4.36E-12
Max. Conc. in Paddys Run at GMR (ug/l)	2.42E-10
Max. Conc. in GMR (ug/l)	2.54E-11

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			0.00E+00	0.00E+00	0.00E+00
D-E	7.5	11.3	13.9		0.00E+00	0.00E+00	0.00E+00
E-F	0.6	1.4	1.0	1.1	1.43E-10	1.57E-13	1.59E-11
SSOD				49.2	6.42E-09	7.03E-12	2.58E-10
TOTAL					6.56E-09		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	0.00E+00	0.00E+00	0.00E+00
D-E	0.00E+00	0.00E+00	0.00E+00
E-F	4.59E-09	5.58E-14	2.75E-14
SSOD	2.05E-07	2.50E-12	1.23E-12
TOTAL	2.10E-07	2.55E-12	1.26E-12

CPC SCREENING **HEPTACHLOR EPOXIDE RISK CRITERIA :** 2.00E-04 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	0.00E+00	YES	0.00E+00	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	6.52E-13	YES	2.58E-10	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: HEPTACHLOR EPOXIDE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	4.64E-11	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	3.68E-10	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	1.21E-09	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	6.52E-13	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	1.30E-08	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	4.30E-08	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	2.16E-07	0.00E+00	0.00E+00

DRAFT

PADDYS RUN BASIN | **CHEMICAL:** ENDRIN ALDEHYDE | **SCENARIO: WITHOUT STORMWATER CONTROLS**

Future

SURFACE WATER MODEL INPUTS: Investigator: DCW Date 5/23/94 21:50

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.15E-05	5.52E-02	1.70E+05	2.00E-01	2.29E-06
WPA	0.00E+00	0.00E+00	1.20E+05	5.09E-01	0.00E+00
Sub570	0.00E+00	0.00E+00	1.99E+05	6.25E-01	0.00E+00
Sub575	0.00E+00	0.00E+00	1.23E+05	2.11E-01	0.00E+00
Sub580	0.00E+00	0.00E+00	4.34E+04	4.40E-02	0.00E+00
PDAR	0.00E+00	0.00E+00	7.06E+05	9.28E-01	0.00E+00
Sub581	0.00E+00	0.00E+00	4.49E+05	4.17E-01	0.00E+00
Sub582	0.00E+00	0.00E+00	3.68E+05	2.97E-01	0.00E+00

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.15E-05	5.52E-02	2.60E-03
WPA & sub570	0.00E+00	0.00E+00	0.00E+00
sub575	0.00E+00	0.00E+00	0.00E+00
Sub 580,PDAR, 581 & 582	0.00E+00	0.00E+00	0.00E+00

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.29E-03	5.20E-04
D-D	2.29E-03	5.20E-04
E-E	2.29E-03	5.20E-04
Max:	2.29E-03	5.20E-04

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	1.75E-04
Avg. Conc. in GMR (ug/l)	1.84E-05
Max. Conc. in Paddys Run at GMR (ug/l)	1.91E-03
Max. Conc. in GMR (ug/l)	2.01E-04

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.14E-02	1.24E-05	8.66E-0[illegible]
D-E	7.5	11.3	13.9		4.14E-03	4.53E-06	3.87E-04
E-F	0.6	1.4	1.0	1.1	3.31E-04	3.63E-07	3.68E-05
SSOD				49.2	0.00E+00	0.00E+00	0.00E+00
TOTAL					1.58E-02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	1.69E+00	2.05E-05	1.01E-05
D-E	6.14E-01	7.47E-06	3.68E-06
E-F	4.91E-02	5.98E-07	2.95E-07
SSOD	0.00E+00	0.00E+00	0.00E+00
TOTAL	2.35E+00	2.86E-05	1.41E-05

CPC SCREENING | **ENDRIN ALDEHYDE RISK CRITERIA :** 1.10E+00 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.15E-05	YES	8.32E-04	YES	Sub580	0.00E+00	YES	0.00E+00	YES
WPA	0.00E+00	YES	0.00E+00	YES	PDAR	0.00E+00	YES	0.00E+00	YES
Sub570	0.00E+00	YES	0.00E+00	YES	Sub581	0.00E+00	YES	0.00E+00	YES
Sub575	0.00E+00	YES	0.00E+00	YES	Sub582	0.00E+00	YES	0.00E+00	YES

DRAFT

CHEMICAL: ENDRIN ALDEHYDE Future

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	2.60E-03	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	2.43E-02	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	1.05E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.15E-05	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	5.52E-02	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.39E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	9.01E-01	0.00E+00	0.00E+00	0.00E+00

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm adsorbed contaminant quantity PXi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual adsorbed contaminant quantity (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Single storm dissolved contaminant quantity PQi (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on sediment yield)(g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Annual dis. conta. qt (based on runoff) (g):	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Attachment F.2.IV

Northeast Ditch Calculations

```
1*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*            MAY   1991             *
*         VERSION 4.0.1E            *
*                                   *
*  RUN DATE  05/30/94  TIME  16:32:16*
*                                   *
*************************************
```

```
*************************************
*                                   *
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*        609 SECOND STREET          *
*     DAVIS, CALIFORNIA 95616       *
*        (916) 551-1748             *
*                                   *
*************************************
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DRAFT

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID          NORTH EAST DITCH SIMULATION (5/30/94 DCW)
  2           ID          THE "NEW DITCH IN THE NE CORNER OF THE FEMP DRAINING TO THE GMR
              *DIAGRAM
  3           IT      10 01JAN93    1200     300
  4           IO       3       0
              *

  5           KK   SUBOS
  6           KM    RUNOFF FROM ONSITE ONLY
  7           KO       1
  8           BA   0.049
  9           PH                   0.333  0.625  1.100  1.400  1.480  1.800    2.1    2.5
 10           LS            59.7
 11           UK    150.    0.21     0.4    100
 12           RK     400    0.02   0.045   0.04   TRAP      0      1     NO
 13           RK    550.   0.036   0.045          TRAP      0      1
              *

 14           KK   SUBNE
 15           KM   RUNOFF FROM WHOLE SUBBASIN TO SAMPLING POINT
 16           BA   0.278
 17           LS            65.4
 18           UK     150   0.015     0.4    100
 19           RK    1300   0.150   0.045  0.278   TRAP      0      1
 20           RK   2800.   0.020   0.045          TRAP      5      1     NO
              *
 21           ZZ
```

1

```
        SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   5        SUBOS
                .
                .
  14            .        SUBNE

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```


```
1*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)*
*            MAY   1991             *
*         VERSION 4.0.1E            *
*                                   *
*  RUN DATE  05/30/94  TIME  16:32:16*
*                                   *
*************************************
```

```
*************************************
*                                   *
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*        609 SECOND STREET          *
*     DAVIS, CALIFORNIA 95616       *
*        (916) 551-1748             *
*                                   *
*************************************
```

DRAFT

```
                                NORTH EAST DITCH SIMULATION (5/30/94 DCW)
                                THE "NEW DITCH IN THE NE CORNER OF THE FEMP DRAINING TO THE GMR

 4 IO          OUTPUT CONTROL VARIABLES
                     IPRNT           3  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                      NMIN          10  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1JAN93  STARTING DATE
                     ITIME        1200  STARTING TIME
                        NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      3JAN93  ENDING DATE
                    NDTIME        1350  ENDING TIME
                     ICENT          19  CENTURY MARK

               COMPUTATION INTERVAL    0.17 HOURS
                    TOTAL TIME BASE   49.83 HOURS

        ENGLISH UNITS
             DRAINAGE AREA          SQUARE MILES
             PRECIPITATION DEPTH    INCHES
             LENGTH, ELEVATION      FEET
             FLOW                   CUBIC FEET PER SECOND
             STORAGE VOLUME         ACRE-FEET
             SURFACE AREA           ACRES
             TEMPERATURE            DEGREES FAHRENHEIT


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
 5 KK       *    SUBOS   *
            *            *
            **************
                        RUNOFF FROM ONSITE ONLY

 7 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           1  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

             SUBBASIN RUNOFF DATA

 8 BA          SUBBASIN CHARACTERISTICS
                     TAREA        0.05  SUBBASIN AREA

               PRECIPITATION DATA

 9 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
               ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
               5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
                0.33    0.63    1.10    1.40    1.48    1.80    2.10    2.50    0.00    0.00    0.00    0.00

                                                 STORM AREA =    0.05

10 LS          SCS LOSS RATE
                     STRTL        1.35  INITIAL ABSTRACTION
                    CRVNBR       59.70  CURVE NUMBER
                     RTIMP        0.00  PERCENT IMPERVIOUS AREA

               KINEMATIC WAVE
11 UK            OVERLAND-FLOW ELEMENT NO. 1
                         L         150.  OVERLAND FLOW LENGTH
                         S      0.2100  SLOPE
                         N       0.400  ROUGHNESS COEFFICIENT
                        PA       100.0  PERCENT OF SUBBASIN
                     DXMIN           5  MINIMUM NUMBER OF DX INTERVALS

               KINEMATIC WAVE
12 RK            COLLECTOR CHANNEL
                         L        400.  CHANNEL LENGTH
                         S      0.0200  SLOPE
                         N       0.045  CHANNEL ROUGHNESS COEFFICIENT
                        CA        0.04  CONTRIBUTING AREA
                     SHAPE        TRAP  CHANNEL SHAPE
                        WD        0.00  BOTTOM WIDTH OR DIAMETER
                         Z        1.00  SIDE SLOPE
                    NDXMIN           2  MINIMUM NUMBER OF DX INTERVALS
13 RK            MAIN CHANNEL
```

000852

DRAFT

L	550.	CHANNEL LENGTH
S	0.0360	SLOPE
N	0.045	CHANNEL ROUGHNESS COEFFICIENT
CA	0.05	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	0.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS
RUPSTQ	NO	ROUTE UPSTREAM HYDROGRAPH

***

COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
PLANE1	1.71	1.67	7.02	30.00	1.38	779.13	0.17	0.07
COLLECTOR1	2.34	1.33	0.83	133.33	1.34	778.32	0.17	2.78
MAIN	3.15	1.33	0.93	183.33	1.34	779.82	0.17	3.66

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.0000E+00 EXCESS=0.4373E+00 OUTFLOW=0.4355E+00 BASIN STORAGE=0.1985E-03 PERCENT ERROR= 0.4

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	3.15	1.33	10.00	1.34	780.00	0.17

****

HYDROGRAPH AT STATION SUBOS

****

DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
1	JAN	1200	1	0.00	0.00	0.00	0.	*	2	JAN	1300	151	0.00	0.00	0.00	0.
1	JAN	1210	2	0.00	0.00	0.00	0.	*	2	JAN	1310	152	0.00	0.00	0.00	0.
1	JAN	1220	3	0.00	0.00	0.00	0.	*	2	JAN	1320	153	0.00	0.00	0.00	0.
1	JAN	1230	4	0.00	0.00	0.00	0.	*	2	JAN	1330	154	0.00	0.00	0.00	0.
1	JAN	1240	5	0.00	0.00	0.00	0.	*	2	JAN	1340	155	0.00	0.00	0.00	0.
1	JAN	1250	6	0.00	0.00	0.00	0.	*	2	JAN	1350	156	0.00	0.00	0.00	0.
1	JAN	1300	7	0.00	0.00	0.00	0.	*	2	JAN	1400	157	0.00	0.00	0.00	0.
1	JAN	1310	8	0.00	0.00	0.00	0.	*	2	JAN	1410	158	0.00	0.00	0.00	0.
1	JAN	1320	9	0.00	0.00	0.00	0.	*	2	JAN	1420	159	0.00	0.00	0.00	0.
1	JAN	1330	10	0.00	0.00	0.00	0.	*	2	JAN	1430	160	0.00	0.00	0.00	0.
1	JAN	1340	11	0.00	0.00	0.00	0.	*	2	JAN	1440	161	0.00	0.00	0.00	0.
1	JAN	1350	12	0.00	0.00	0.00	0.	*	2	JAN	1450	162	0.00	0.00	0.00	0.
1	JAN	1400	13	0.00	0.00	0.00	0.	*	2	JAN	1500	163	0.00	0.00	0.00	0.
1	JAN	1410	14	0.01	0.01	0.00	0.	*	2	JAN	1510	164	0.00	0.00	0.00	0.
1	JAN	1420	15	0.01	0.01	0.00	0.	*	2	JAN	1520	165	0.00	0.00	0.00	0.
1	JAN	1430	16	0.01	0.01	0.00	0.	*	2	JAN	1530	166	0.00	0.00	0.00	0.
1	JAN	1440	17	0.01	0.01	0.00	0.	*	2	JAN	1540	167	0.00	0.00	0.00	0.
1	JAN	1450	18	0.01	0.01	0.00	0.	*	2	JAN	1550	168	0.00	0.00	0.00	0.
1	JAN	1500	19	0.01	0.01	0.00	0.	*	2	JAN	1600	169	0.00	0.00	0.00	0.
1	JAN	1510	20	0.01	0.01	0.00	0.	*	2	JAN	1610	170	0.00	0.00	0.00	0.
1	JAN	1520	21	0.01	0.01	0.00	0.	*	2	JAN	1620	171	0.00	0.00	0.00	0.
1	JAN	1530	22	0.01	0.01	0.00	0.	*	2	JAN	1630	172	0.00	0.00	0.00	0.
1	JAN	1540	23	0.01	0.01	0.00	0.	*	2	JAN	1640	173	0.00	0.00	0.00	0.
1	JAN	1550	24	0.01	0.01	0.00	0.	*	2	JAN	1650	174	0.00	0.00	0.00	0.
1	JAN	1600	25	0.01	0.01	0.00	0.	*	2	JAN	1700	175	0.00	0.00	0.00	0.
1	JAN	1610	26	0.01	0.01	0.00	0.	*	2	JAN	1710	176	0.00	0.00	0.00	0.
1	JAN	1620	27	0.01	0.01	0.00	0.	*	2	JAN	1720	177	0.00	0.00	0.00	0.
1	JAN	1630	28	0.01	0.01	0.00	0.	*	2	JAN	1730	178	0.00	0.00	0.00	0.
1	JAN	1640	29	0.01	0.01	0.00	0.	*	2	JAN	1740	179	0.00	0.00	0.00	0.
1	JAN	1650	30	0.01	0.01	0.00	0.	*	2	JAN	1750	180	0.00	0.00	0.00	0.
1	JAN	1700	31	0.01	0.01	0.00	0.	*	2	JAN	1800	181	0.00	0.00	0.00	0.
1	JAN	1710	32	0.01	0.01	0.00	0.	*	2	JAN	1810	182	0.00	0.00	0.00	0.
1	JAN	1720	33	0.01	0.01	0.00	0.	*	2	JAN	1820	183	0.00	0.00	0.00	0.
1	JAN	1730	34	0.01	0.01	0.00	0.	*	2	JAN	1830	184	0.00	0.00	0.00	0.
1	JAN	1740	35	0.01	0.01	0.00	0.	*	2	JAN	1840	185	0.00	0.00	0.00	0.
1	JAN	1750	36	0.01	0.01	0.00	0.	*	2	JAN	1850	186	0.00	0.00	0.00	0.
1	JAN	1800	37	0.01	0.01	0.00	0.	*	2	JAN	1900	187	0.00	0.00	0.00	0.
1	JAN	1810	38	0.01	0.01	0.00	0.	*	2	JAN	1910	188	0.00	0.00	0.00	0.
1	JAN	1820	39	0.01	0.01	0.00	0.	*	2	JAN	1920	189	0.00	0.00	0.00	0.
1	JAN	1830	40	0.01	0.01	0.00	0.	*	2	JAN	1930	190	0.00	0.00	0.00	0.
1	JAN	1840	41	0.01	0.01	0.00	0.	*	2	JAN	1940	191	0.00	0.00	0.00	0.
1	JAN	1850	42	0.01	0.01	0.00	0.	*	2	JAN	1950	192	0.00	0.00	0.00	0.
1	JAN	1900	43	0.01	0.01	0.00	0.	*	2	JAN	2000	193	0.00	0.00	0.00	0.
1	JAN	1910	44	0.01	0.01	0.00	0.	*	2	JAN	2010	194	0.00	0.00	0.00	0.
1	JAN	1920	45	0.01	0.01	0.00	0.	*	2	JAN	2020	195	0.00	0.00	0.00	0.
1	JAN	1930	46	0.01	0.01	0.00	0.	*	2	JAN	2030	196	0.00	0.00	0.00	0.
1	JAN	1940	47	0.01	0.01	0.00	0.	*	2	JAN	2040	197	0.00	0.00	0.00	0.
1	JAN	1950	48	0.01	0.01	0.00	0.	*	2	JAN	2050	198	0.00	0.00	0.00	0.

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1	JAN	2000	49	0.01	0.01	0.00	0.	*
1	JAN	2010	50	0.01	0.01	0.00	0.	*
1	JAN	2020	51	0.01	0.01	0.00	0.	*
1	JAN	2030	52	0.01	0.01	0.00	0.	*
1	JAN	2040	53	0.01	0.01	0.00	0.	*
1	JAN	2050	54	0.01	0.01	0.00	0.	*
1	JAN	2100	55	0.01	0.01	0.00	0.	*
1	JAN	2110	56	0.01	0.01	0.00	0.	*
1	JAN	2120	57	0.01	0.01	0.00	0.	*
1	JAN	2130	58	0.02	0.02	0.00	0.	*
1	JAN	2140	59	0.02	0.02	0.00	0.	*
1	JAN	2150	60	0.02	0.02	0.00	0.	*
1	JAN	2200	61	0.02	0.02	0.00	0.	*
1	JAN	2210	62	0.02	0.02	0.00	0.	*
1	JAN	2220	63	0.02	0.02	0.00	0.	*
1	JAN	2230	64	0.02	0.02	0.00	0.	*
1	JAN	2240	65	0.01	0.01	0.00	0.	*
1	JAN	2250	66	0.01	0.01	0.00	0.	*
1	JAN	2300	67	0.01	0.01	0.00	0.	*
1	JAN	2310	68	0.04	0.04	0.00	0.	*
1	JAN	2320	69	0.05	0.05	0.00	0.	*
1	JAN	2330	70	0.06	0.06	0.00	0.	*
1	JAN	2340	71	0.07	0.07	0.00	0.	*
1	JAN	2350	72	0.09	0.09	0.00	0.	*
2	JAN	0000	73	0.21	0.21	0.00	0.	*
2	JAN	0010	74	0.51	0.50	0.01	0.	*
2	JAN	0020	75	0.14	0.13	0.01	0.	*
2	JAN	0030	76	0.08	0.07	0.01	0.	*
2	JAN	0040	77	0.06	0.05	0.01	1.	*
2	JAN	0050	78	0.05	0.04	0.01	1.	*
2	JAN	0100	79	0.04	0.04	0.01	1.	*
2	JAN	0110	80	0.02	0.01	0.00	1.	*
2	JAN	0120	81	0.01	0.01	0.00	1.	*
2	JAN	0130	82	0.01	0.01	0.00	1.	*
2	JAN	0140	83	0.02	0.02	0.00	1.	*
2	JAN	0150	84	0.02	0.02	0.00	1.	*
2	JAN	0200	85	0.02	0.02	0.00	1.	*
2	JAN	0210	86	0.02	0.02	0.00	1.	*
2	JAN	0220	87	0.02	0.01	0.00	1.	*
2	JAN	0230	88	0.02	0.01	0.00	1.	*
2	JAN	0240	89	0.02	0.01	0.00	1.	*
2	JAN	0250	90	0.02	0.01	0.00	1.	*
2	JAN	0300	91	0.01	0.01	0.00	1.	*
2	JAN	0310	92	0.01	0.01	0.00	1.	*
2	JAN	0320	93	0.01	0.01	0.00	1.	*
2	JAN	0330	94	0.01	0.01	0.00	0.	*
2	JAN	0340	95	0.01	0.01	0.00	0.	*
2	JAN	0350	96	0.01	0.01	0.00	0.	*
2	JAN	0400	97	0.01	0.01	0.00	0.	*
2	JAN	0410	98	0.01	0.01	0.00	0.	*
2	JAN	0420	99	0.01	0.01	0.00	0.	*
2	JAN	0430	100	0.01	0.01	0.00	0.	*
2	JAN	0440	101	0.01	0.01	0.00	0.	*
2	JAN	0450	102	0.01	0.01	0.00	0.	*
2	JAN	0500	103	0.01	0.01	0.00	0.	*
2	JAN	0510	104	0.01	0.01	0.00	0.	*
2	JAN	0520	105	0.01	0.01	0.00	0.	*
2	JAN	0530	106	0.01	0.01	0.00	0.	*
2	JAN	0540	107	0.01	0.01	0.00	0.	*
2	JAN	0550	108	0.01	0.01	0.00	0.	*
2	JAN	0600	109	0.01	0.01	0.00	0.	*
2	JAN	0610	110	0.01	0.01	0.00	0.	*
2	JAN	0620	111	0.01	0.01	0.00	0.	*
2	JAN	0630	112	0.01	0.01	0.00	0.	*
2	JAN	0640	113	0.01	0.01	0.00	0.	*
2	JAN	0650	114	0.01	0.01	0.00	0.	*
2	JAN	0700	115	0.01	0.01	0.00	0.	*
2	JAN	0710	116	0.01	0.00	0.00	0.	*
2	JAN	0720	117	0.01	0.00	0.00	0.	*
2	JAN	0730	118	0.01	0.00	0.00	0.	*
2	JAN	0740	119	0.01	0.00	0.00	0.	*
2	JAN	0750	120	0.01	0.00	0.00	0.	*
2	JAN	0800	121	0.01	0.00	0.00	0.	*
2	JAN	0810	122	0.01	0.00	0.00	0.	*
2	JAN	0820	123	0.01	0.00	0.00	0.	*
2	JAN	0830	124	0.01	0.00	0.00	0.	*
2	JAN	0840	125	0.01	0.00	0.00	0.	*
2	JAN	0850	126	0.01	0.00	0.00	0.	*
2	JAN	0900	127	0.01	0.00	0.00	0.	*
2	JAN	0910	128	0.01	0.00	0.00	0.	*
2	JAN	0920	129	0.01	0.00	0.00	0.	*
2	JAN	0930	130	0.01	0.00	0.00	0.	*
2	JAN	0940	131	0.01	0.00	0.00	0.	*
2	JAN	0950	132	0.01	0.00	0.00	0.	*
2	JAN	1000	133	0.01	0.00	0.00	0.	*
2	JAN	1010	134	0.00	0.00	0.00	0.	*
2	JAN	1020	135	0.00	0.00	0.00	0.	*
2	JAN	1030	136	0.00	0.00	0.00	0.	*
2	JAN	2100	199	0.00	0.00	0.00	0.	
2	JAN	2110	200	0.00	0.00	0.00	0.	
2	JAN	2120	201	0.00	0.00	0.00	0.	
2	JAN	2130	202	0.00	0.00	0.00	0.	
2	JAN	2140	203	0.00	0.00	0.00	0.	
2	JAN	2150	204	0.00	0.00	0.00	0.	
2	JAN	2200	205	0.00	0.00	0.00	0.	
2	JAN	2210	206	0.00	0.00	0.00	0.	
2	JAN	2220	207	0.00	0.00	0.00	0.	
2	JAN	2230	208	0.00	0.00	0.00	0.	
2	JAN	2240	209	0.00	0.00	0.00	0.	
2	JAN	2250	210	0.00	0.00	0.00	0.	
2	JAN	2300	211	0.00	0.00	0.00	0.	
2	JAN	2310	212	0.00	0.00	0.00	0.	
2	JAN	2320	213	0.00	0.00	0.00	0.	
2	JAN	2330	214	0.00	0.00	0.00	0.	
2	JAN	2340	215	0.00	0.00	0.00	0.	
2	JAN	2350	216	0.00	0.00	0.00	0.	
3	JAN	0000	217	0.00	0.00	0.00	0.	
3	JAN	0010	218	0.00	0.00	0.00	0.	
3	JAN	0020	219	0.00	0.00	0.00	0.	
3	JAN	0030	220	0.00	0.00	0.00	0.	
3	JAN	0040	221	0.00	0.00	0.00	0.	
3	JAN	0050	222	0.00	0.00	0.00	0.	
3	JAN	0100	223	0.00	0.00	0.00	0.	
3	JAN	0110	224	0.00	0.00	0.00	0.	
3	JAN	0120	225	0.00	0.00	0.00	0.	
3	JAN	0130	226	0.00	0.00	0.00	0.	
3	JAN	0140	227	0.00	0.00	0.00	0.	
3	JAN	0150	228	0.00	0.00	0.00	0.	
3	JAN	0200	229	0.00	0.00	0.00	0.	
3	JAN	0210	230	0.00	0.00	0.00	0.	
3	JAN	0220	231	0.00	0.00	0.00	0.	
3	JAN	0230	232	0.00	0.00	0.00	0.	
3	JAN	0240	233	0.00	0.00	0.00	0.	
3	JAN	0250	234	0.00	0.00	0.00	0.	
3	JAN	0300	235	0.00	0.00	0.00	0.	
3	JAN	0310	236	0.00	0.00	0.00	0.	
3	JAN	0320	237	0.00	0.00	0.00	0.	
3	JAN	0330	238	0.00	0.00	0.00	0.	
3	JAN	0340	239	0.00	0.00	0.00	0.	
3	JAN	0350	240	0.00	0.00	0.00	0.	
3	JAN	0400	241	0.00	0.00	0.00	0.	
3	JAN	0410	242	0.00	0.00	0.00	0.	
3	JAN	0420	243	0.00	0.00	0.00	0.	
3	JAN	0430	244	0.00	0.00	0.00	0.	
3	JAN	0440	245	0.00	0.00	0.00	0.	
3	JAN	0450	246	0.00	0.00	0.00	0.	
3	JAN	0500	247	0.00	0.00	0.00	0.	
3	JAN	0510	248	0.00	0.00	0.00	0.	
3	JAN	0520	249	0.00	0.00	0.00	0.	
3	JAN	0530	250	0.00	0.00	0.00	0.	
3	JAN	0540	251	0.00	0.00	0.00	0.	
3	JAN	0550	252	0.00	0.00	0.00	0.	
3	JAN	0600	253	0.00	0.00	0.00	0.	
3	JAN	0610	254	0.00	0.00	0.00	0.	
3	JAN	0620	255	0.00	0.00	0.00	0.	
3	JAN	0630	256	0.00	0.00	0.00	0.	
3	JAN	0640	257	0.00	0.00	0.00	0.	
3	JAN	0650	258	0.00	0.00	0.00	0.	
3	JAN	0700	259	0.00	0.00	0.00	0.	
3	JAN	0710	260	0.00	0.00	0.00	0.	
3	JAN	0720	261	0.00	0.00	0.00	0.	
3	JAN	0730	262	0.00	0.00	0.00	0.	
3	JAN	0740	263	0.00	0.00	0.00	0.	
3	JAN	0750	264	0.00	0.00	0.00	0.	
3	JAN	0800	265	0.00	0.00	0.00	0.	
3	JAN	0810	266	0.00	0.00	0.00	0.	
3	JAN	0820	267	0.00	0.00	0.00	0.	
3	JAN	0830	268	0.00	0.00	0.00	0.	
3	JAN	0840	269	0.00	0.00	0.00	0.	
3	JAN	0850	270	0.00	0.00	0.00	0.	
3	JAN	0900	271	0.00	0.00	0.00	0.	
3	JAN	0910	272	0.00	0.00	0.00	0.	
3	JAN	0920	273	0.00	0.00	0.00	0.	
3	JAN	0930	274	0.00	0.00	0.00	0.	
3	JAN	0940	275	0.00	0.00	0.00	0.	
3	JAN	0950	276	0.00	0.00	0.00	0.	
3	JAN	1000	277	0.00	0.00	0.00	0.	
3	JAN	1010	278	0.00	0.00	0.00	0.	
3	JAN	1020	279	0.00	0.00	0.00	0.	
3	JAN	1030	280	0.00	0.00	0.00	0.	
3	JAN	1040	281	0.00	0.00	0.00	0.	
3	JAN	1050	282	0.00	0.00	0.00	0.	
3	JAN	1100	283	0.00	0.00	0.00	0.	
3	JAN	1110	284	0.00	0.00	0.00	0.	
3	JAN	1120	285	0.00	0.00	0.00	0.	
3	JAN	1130	286	0.00	0.00	0.00	0.	

2	JAN	1040	137	0.00	0.00	0.00	0.	*	3	JAN	1140	287	0.00	0.00	0.00	0.
2	JAN	1050	138	0.00	0.00	0.00	0.	*	3	JAN	1150	288	0.00	0.00	0.00	0.
2	JAN	1100	139	0.00	0.00	0.00	0.	*	3	JAN	1200	289	0.00	0.00	0.00	0.
2	JAN	1110	140	0.00	0.00	0.00	0.	*	3	JAN	1210	290	0.00	0.00	0.00	0.
2	JAN	1120	141	0.00	0.00	0.00	0.	*	3	JAN	1220	291	0.00	0.00	0.00	0.
2	JAN	1130	142	0.00	0.00	0.00	0.	*	3	JAN	1230	292	0.00	0.00	0.00	0.
2	JAN	1140	143	0.00	0.00	0.00	0.	*	3	JAN	1240	293	0.00	0.00	0.00	0.
2	JAN	1150	144	0.00	0.00	0.00	0.	*	3	JAN	1250	294	0.00	0.00	0.00	0.
2	JAN	1200	145	0.00	0.00	0.00	0.	*	3	JAN	1300	295	0.00	0.00	0.00	0.
2	JAN	1210	146	0.00	0.00	0.00	0.	*	3	JAN	1310	296	0.00	0.00	0.00	0.
2	JAN	1220	147	0.00	0.00	0.00	0.	*	3	JAN	1320	297	0.00	0.00	0.00	0.
2	JAN	1230	148	0.00	0.00	0.00	0.	*	3	JAN	1330	298	0.00	0.00	0.00	0.
2	JAN	1240	149	0.00	0.00	0.00	0.	*	3	JAN	1340	299	0.00	0.00	0.00	0.
2	JAN	1250	150	0.00	0.00	0.00	0.	*	3	JAN	1350	300	0.00	0.00	0.00	0.
								*								

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TOTAL RAINFALL = 2.50, TOTAL LOSS = 2.33, TOTAL EXCESS = 0.17

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	49.83-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1.	13.00		1.	0.	0.	0.
		(INCHES)	0.107	0.166	0.167	0.167
		(AC-FT)	0.	0.	0.	0.

CUMULATIVE AREA = 0.05 SQ MI

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              **************
              *            *
14 KK         *    SUBNE   *
              *            *
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RUNOFF FROM WHOLE SUBBASIN TO SAMPLING POINT

SUBBASIN RUNOFF DATA

16 BA SUBBASIN CHARACTERISTICS

TAREA	0.28	SUBBASIN AREA

PRECIPITATION DATA

9 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
0.33	0.63	1.10	1.40	1.48	1.80	2.10	2.50	0.00	0.00	0.00	0.00

STORM AREA = 0.28

17 LS SCS LOSS RATE

STRTL	1.06	INITIAL ABSTRACTION
CRVNBR	65.40	CURVE NUMBER
RTIMP	0.00	PERCENT IMPERVIOUS AREA

KINEMATIC WAVE

18 UK OVERLAND-FLOW ELEMENT NO. 1

L	150.	OVERLAND FLOW LENGTH
S	0.0150	SLOPE
N	0.400	ROUGHNESS COEFFICIENT
PA	100.0	PERCENT OF SUBBASIN
DXMIN	5	MINIMUM NUMBER OF DX INTERVALS

KINEMATIC WAVE

19 RK COLLECTOR CHANNEL

L	1300.	CHANNEL LENGTH
S	0.1500	SLOPE
N	0.045	CHANNEL ROUGHNESS COEFFICIENT
CA	0.28	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	0.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

RK MAIN CHANNEL

L	2800.	CHANNEL LENGTH
S	0.0200	SLOPE
N	0.045	CHANNEL ROUGHNESS COEFFICIENT
CA	0.28	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	5.00	BOTTOM WIDTH OR DIAMETER
Z	1.00	SIDE SLOPE
NDXMIN	2	MINIMUM NUMBER OF DX INTERVALS

RUPSTQ NO ROUTE UPSTREAM HYDROGRAPH

DRAFT

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COMPUTED KINEMATIC PARAMETERS
VARIABLE TIME STEP
(DT SHOWN IS A MINIMUM)

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
PLANE1	0.46	1.67	10.00	25.00	12.91	794.19	0.31	0.04
COLLECTOR1	6.42	1.33	0.82	433.33	12.56	790.20	0.31	11.01
MAIN	1.75	1.42	3.33	933.33	12.42	799.28	0.31	4.78

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.0000E+00 EXCESS=0.4573E+01 OUTFLOW=0.4536E+01 BASIN STORAGE=0.1015E-01 PERCENT ERROR= 0.6

4.573

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	1.75	1.42	10.00	12.41	800.00	0.31

*** *** *** *** ***

HYDROGRAPH AT STATION SUBNE

TOTAL RAINFALL = 2.50, TOTAL LOSS = 2.19, TOTAL EXCESS = 0.31

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	49.83-HR
		(CFS)	6.	2.	1.	1.
12.	13.33	(INCHES)	0.201	0.304	0.306	0.306
		(AC-FT)	3.	5.	5.	5.

CUMULATIVE AREA = 0.28 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SUBOS	1.	13.00	1.	0.	0.	0.05		
HYDROGRAPH AT	SUBNE	12.	13.33	6.	2.	1.	0.28		

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
SUBOS	MANE	0.93	1.34	779.82	0.17	10.00	1.34	780.00	0.17

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.0000E+00 EXCESS=0.4373E+00 OUTFLOW=0.4355E+00 BASIN STORAGE=0.1985E-03 PERCENT ERROR= 0.4

SUBNE	MANE	3.33	12.42	799.28	0.31	10.00	12.41	800.00	0.31

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.0000E+00 EXCESS=0.4573E+01 OUTFLOW=0.4536E+01 BASIN STORAGE=0.1015E-01 PERCENT ERROR= 0.6

*** NORMAL END OF HEC-1 ***

SUBBASIN NE ALL **CHEMICAL:** **ARSENIC** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:21

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	200	5.56	2.29E-01
NEb	200	6.1	4.90E-02

Area	Ss (g)	Ds (g)
NEa	4.778E+04	3.625E+01
NEb	1.122E+04	8.509E+00
Total	5.900E+04	4.476E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

ARSENIC in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	5.65E+00
Single storm adsorbed contaminant quantity PXi (g):	5.12E+00
Annual adsorbed contaminant quantity (g):	1.78E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	9.85E-04
Single storm dissolved contaminant quantity PQi (g):	5.55E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.93E+02
Annual dis. conta. qt (based on runoff) (g):	9.15E+01

DRAFT

NE ON-SITE | CHEMICAL: ARSENIC | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:21

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.00E+02	6.10E+00	4.90E-02

Area	Ss (g)	Ds (g)
NEb	1.122E+04	8.509E+00
Total	1.122E+04	8.509E+00

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

ARSENIC in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	6.10E+00
Single storm adsorbed contaminant quantity PXi (g):	1.56E+00
Annual adsorbed contaminant quantity (g):	1.42E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.06E-03
Single storm dissolved contaminant quantity PQi (g):	5.79E-01
Annual dis. conta. qt (based on sediment yield)(g):	5.26E+01
Annual dis. conta. qt (based on runoff) (g):	9.48E+00

DRAFT

SUBBASIN NE ALL **CHEMICAL:** **BERYLLIUM** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:22

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	1300	0.6	2.29E-01
NEb	1300	0.8	4.90E-02

Area	Ss (g)	Ds (g)
NEa	5.159E+03	6.022E-01
NEb	1.472E+03	1.718E-01
Total	6.631E+03	7.740E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

BERYLLIUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	6.35E-01
Single storm adsorbed contaminant quantity PXi (g):	5.75E-01
Annual adsorbed contaminant quantity (g):	2.00E+01

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.70E-05
Single storm dissolved contaminant quantity PQi (g):	9.60E-02
Annual dis. conta. qt (based on sediment yield)(g):	3.34E+00
Annual dis. conta. qt (based on runoff) (g):	1.58E+00

DRAFT

NE ON-SITE | CHEMICAL: BERYLLIUM | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:22

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	1.30E+03	8.00E-01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	1.472E+03	1.718E-01
Total	1.472E+03	1.718E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

BERYLLIUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	8.00E-01
Single storm adsorbed contaminant quantity PXi (g):	2.05E-01
Annual adsorbed contaminant quantity (g):	1.86E+01

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.13E-05
Single storm dissolved contaminant quantity PQi (g):	1.17E-02
Annual dis. conta. qt (based on sediment yield)(g):	1.06E+00
Annual dis. conta. qt (based on runoff) (g):	1.91E-01

DRAFT

000860

SUBBASIN NE ALL **CHEMICAL:** **HEX-CHROMIUM** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:22

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	37	1.16	2.29E-01
NEb	37	1.76	4.90E-02

Area	Ss (g)	Ds (g)
NEa	9.935E+03	4.074E+01
NEb	3.226E+03	1.323E+01
Total	1.316E+04	5.397E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

HEX-CHROMIUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.26E+00
Single storm adsorbed contaminant quantity PXi (g):	1.14E+00
Annual adsorbed contaminant quantity (g):	3.97E+01

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.19E-03
Single storm dissolved contaminant quantity PQi (g):	6.69E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.33E+02
Annual dis. conta. qt (based on runoff) (g):	1.10E+02

DRAFT

NE ON-SITE | CHEMICAL: HEX-CHROMIUM | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:22

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	3.70E+01	1.76E+00	4.90E-02

Area	Ss (g)	Ds (g)
NEb	3.226E+03	1.323E+01
Total	3.226E+03	1.323E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

HEX-CHROMIUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.75E+00
Single storm adsorbed contaminant quantity PXi (g):	4.50E-01
Annual adsorbed contaminant quantity (g):	4.08E+01

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.64E-03
Single storm dissolved contaminant quantity PQi (g):	8.99E-01
Annual dis. conta. qt (based on sediment yield)(g):	8.17E+01
Annual dis. conta. qt (based on runoff) (g):	1.47E+01

DRAFT

SUBBASIN NE ALL **CHEMICAL:** **COPPER** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:23

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	125	8.6	2.29E-01
NEb	125	27.7	4.90E-02

Area	Ss (g)	Ds (g)
NEa	7.387E+04	8.966E+01
NEb	5.091E+04	6.180E+01
Total	1.248E+05	1.515E+02

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

COPPER in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.20E+01
Single storm adsorbed contaminant quantity PXi (g):	1.08E+01
Annual adsorbed contaminant quantity (g):	3.76E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.33E-03
Single storm dissolved contaminant quantity PQi (g):	1.88E+01
Annual dis. conta. qt (based on sediment yield)(g):	6.53E+02
Annual dis. conta. qt (based on runoff) (g):	3.10E+02

DRAFT

NE ON-SITE	CHEMICAL: COPPER	Baseline	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:23

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	1.25E+02	2.77E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	5.091E+04	6.180E+01
Total	5.091E+04	6.180E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

COPPER in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.77E+01
Single storm adsorbed contaminant quantity PXi (g):	7.10E+00
Annual adsorbed contaminant quantity (g):	6.45E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	7.67E-03
Single storm dissolved contaminant quantity PQi (g):	4.20E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.82E+02
Annual dis. conta. qt (based on runoff) (g):	6.89E+01

DRAFT

SUBBASIN NE ALL **CHEMICAL:** **LEAD** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:23

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	3000	18.9	2.29E-01
NEb	3000	19.2	4.90E-02

Area	Ss (g)	Ds (g)
NEa	1.625E+05	8.220E+00
NEb	3.533E+04	1.787E+00
Total	1.979E+05	1.001E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

LEAD in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.90E+01
Single storm adsorbed contaminant quantity PXi (g):	1.72E+01
Annual adsorbed contaminant quantity (g):	5.97E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.20E-04
Single storm dissolved contaminant quantity PQi (g):	1.24E+00
Annual dis. conta. qt (based on sediment yield)(g):	4.31E+01
Annual dis. conta. qt (based on runoff) (g):	2.05E+01

DRAFT

NE ON-SITE | CHEMICAL: LEAD | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:23

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	3.00E+03	1.92E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	3.533E+04	1.787E+00
Total	3.533E+04	1.787E+00

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

LEAD in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.92E+01
Single storm adsorbed contaminant quantity PXi (g):	4.92E+00
Annual adsorbed contaminant quantity (g):	4.47E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.22E-04
Single storm dissolved contaminant quantity PQi (g):	1.22E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.10E+01
Annual dis. conta. qt (based on runoff) (g):	1.99E+00

DRAFT

SUBBASIN NE ALL **CHEMICAL:** **MAGNESIUM** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:24

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	4.5	1926	2.29E-01
NEb	4.5	2820	4.90E-02

Area	Ss (g)	Ds (g)
NEa	1.602E+07	5.403E+05
NEb	5.020E+06	1.693E+05
Total	2.104E+07	7.095E+05

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

MAGNESIUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.02E+03
Single storm adsorbed contaminant quantity PXi (g):	1.83E+03
Annual adsorbed contaminant quantity (g):	6.34E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.56E+01
Single storm dissolved contaminant quantity PQi (g):	8.80E+04
Annual dis. conta. qt (based on sediment yield)(g):	3.06E+06
Annual dis. conta. qt (based on runoff) (g):	1.45E+06

DRAFT

NE ON-SITE CHEMICAL: MAGNESIUM Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:24

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	4.50E+00	2.82E+03	4.90E-02

Area	Ss (g)	Ds (g)
NEb	5.020E+06	1.693E+05
Total	5.020E+06	1.693E+05

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

MAGNESIUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.73E+03
Single storm adsorbed contaminant quantity PXi (g):	7.00E+02
Annual adsorbed contaminant quantity (g):	6.36E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.10E+01
Single storm dissolved contaminant quantity PQi (g):	1.15E+04
Annual dis. conta. qt (based on sediment yield)(g):	1.05E+06
Annual dis. conta. qt (based on runoff) (g):	1.89E+05

DRAFT

000868

SUBBASIN NE ALL **CHEMICAL:** **MANGANESE** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:24

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	180	814	2.29E-01
NEb	180	1170	4.90E-02

Area	Ss (g)	Ds (g)
NEa	6.995E+06	5.896E+03
NEb	2.151E+06	1.813E+03
Total	9.146E+06	7.709E+03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

MANGANESE in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	8.76E+02
Single storm adsorbed contaminant quantity PXi (g):	7.93E+02
Annual adsorbed contaminant quantity (g):	2.76E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.70E-01
Single storm dissolved contaminant quantity PQi (g):	9.56E+02
Annual dis. conta. qt (based on sediment yield)(g):	3.32E+04
Annual dis. conta. qt (based on runoff) (g):	1.58E+04

DRAFT

NE ON-SITE CHEMICAL: MANGANESE Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:24

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	1.80E+02	1.17E+03	4.90E-02

Area	Ss (g)	Ds (g)
NEb	2.151E+06	1.813E+03
Total	2.151E+06	1.813E+03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

MANGANESE in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.17E+03
Single storm adsorbed contaminant quantity PXi (g):	3.00E+02
Annual adsorbed contaminant quantity (g):	2.72E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.25E-01
Single storm dissolved contaminant quantity PQi (g):	1.23E+02
Annual dis. conta. qt (based on sediment yield)(g):	1.12E+04
Annual dis. conta. qt (based on runoff) (g):	2.02E+03

DRAFT

000870

SUBBASIN NE ALL **CHEMICAL:** **MOLYBDENUM** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:25

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	90	2.7	2.29E-01
NEb	90	11.3	4.90E-02

Area	Ss (g)	Ds (g)
NEa	2.318E+04	3.908E+01
NEb	2.076E+04	3.500E+01
Total	4.394E+04	7.408E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

MOLYBDENUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.21E+00
Single storm adsorbed contaminant quantity PXi (g):	3.81E+00
Annual adsorbed contaminant quantity (g):	1.32E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.63E-03
Single storm dissolved contaminant quantity PQi (g):	9.19E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.19E+02
Annual dis. conta. qt (based on runoff) (g):	1.51E+02

DRAFT

NE ON-SITE | CHEMICAL: MOLYBDENUM | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:25

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	9.00E+01	1.13E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	2.076E+04	3.500E+01
Total	2.076E+04	3.500E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

MOLYBDENUM in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.13E+01
Single storm adsorbed contaminant quantity PXi (g):	2.89E+00
Annual adsorbed contaminant quantity (g):	2.63E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	4.34E-03
Single storm dissolved contaminant quantity PQi (g):	2.38E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.16E+02
Annual dis. conta. qt (based on runoff) (g):	3.90E+01

DRAFT

6161

SUBBASIN NE ALL **CHEMICAL:** Ce-137 Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:25

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	9038.054	5.1E-09	2.29E-01
NEb	9038.054	9.97688E-09	4.90E-02

Area	Ss (g)	Ds (g)
NEa	4.386E-05	7.363E-10
NEb	1.836E-05	3.082E-10
Total	6.222E-05	1.044E-09

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

Ce-137 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	5.96E-09
Single storm adsorbed contaminant quantity PXi (g):	5.40E-09
Annual adsorbed contaminant quantity (g):	1.88E-07

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.30E-14
Single storm dissolved contaminant quantity PQi (g):	1.30E-10
Annual dis. conta. qt (based on sediment yield)(g):	4.50E-09
Annual dis. conta. qt (based on runoff) (g):	2.14E-09

DRAFT

NE ON-SITE | CHEMICAL: Ce-137 | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:25

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	9.04E+03	9.98E-09	4.90E-02

Area	Ss (g)	Ds (g)
NEb	1.836E-05	3.082E-10
Total	1.836E-05	3.082E-10

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

Ce-137 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.98E-09
Single storm adsorbed contaminant quantity PXi (g):	2.56E-09
Annual adsorbed contaminant quantity (g):	2.32E-07

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.82E-14
Single storm dissolved contaminant quantity PQi (g):	2.10E-11
Annual dis. conta. qt (based on sediment yield)(g):	1.90E-09
Annual dis. conta. qt (based on runoff) (g):	3.43E-1[illegible]

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DRAFT

SUBBASIN NE ALL **CHEMICAL:** **SR-90** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:26

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	54.54931	0	2.29E-01
NEb	54.54931	2.62774E-08	4.90E-02

Area	Ss (g)	Ds (g)
NEa	0.000E+00	0.000E+00
NEb	4.822E-05	1.341E-07
Total	4.822E-05	1.341E-07

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

SR-90 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.62E-09
Single storm adsorbed contaminant quantity PXi (g):	4.18E-09
Annual adsorbed contaminant quantity (g):	1.45E-07

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.95E-12
Single storm dissolved contaminant quantity PQi (g):	1.66E-08
Annual dis. conta. qt (based on sediment yield)(g):	5.78E-07
Annual dis. conta. qt (based on runoff) (g):	2.74E-07

DRAFT

NE ON-SITE	CHEMICAL: SR-90	Baseline	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:26

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	5.45E+01	2.63E-08	4.90E-02

Area	Ss (g)	Ds (g)
NEb	4.822E-05	1.341E-07
Total	4.822E-05	1.341E-07

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

SR-90 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.62E-08
Single storm adsorbed contaminant quantity PXi (g):	6.72E-09
Annual adsorbed contaminant quantity (g):	6.11E-07

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.66E-11
Single storm dissolved contaminant quantity PQi (g):	9.12E-09
Annual dis. conta. qt (based on sediment yield)(g):	8.29E-07
Annual dis. conta. qt (based on runoff) (g):	1.49E-07

DRAFT

000876

SUBBASIN NE ALL **CHEMICAL:** **TH-232** Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:26

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	5800	9.82	2.29E-01
NEb	5800	10.37272727	4.90E-02

Area	Ss (g)	Ds (g)
NEa	8.445E+04	2.209E+00
NEb	1.909E+04	4.993E-01
Total	1.035E+05	2.708E+00

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

TH-232 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.92E+00
Single storm adsorbed contaminant quantity PXi (g):	8.98E+00
Annual adsorbed contaminant quantity (g):	3.12E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.96E-05
Single storm dissolved contaminant quantity PQi (g):	3.36E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.17E+01
Annual dis. conta. qt (based on runoff) (g):	5.54E+00

DRAFT

NE ON-SITE | CHEMICAL: TH-232 | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:26

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	5.80E+03	1.04E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	1.909E+04	4.993E-01
Total	1.909E+04	4.993E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

TH-232 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.04E+01
Single storm adsorbed contaminant quantity PXi (g):	2.66E+00
Annual adsorbed contaminant quantity (g):	2.42E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	6.20E-05
Single storm dissolved contaminant quantity PQi (g):	3.40E-02
Annual dis. conta. qt (based on sediment yield)(g):	3.08E+00
Annual dis. conta. qt (based on runoff) (g):	5.56E-01

DRAFT

SUBBASIN NE ALL **CHEMICAL:** U(TOTAL) Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:27

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222	3.24	2.29E-01
NEb	222	24.74	4.90E-02

Area	Ss (g)	Ds (g)
NEa	2.785E+04	1.903E+01
NEb	4.550E+04	3.109E+01
Total	7.334E+04	5.012E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U(TOTAL) in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	7.02E+00
Single storm adsorbed contaminant quantity PXi (g):	6.36E+00
Annual adsorbed contaminant quantity (g):	2.21E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.10E-03
Single storm dissolved contaminant quantity PQi (g):	6.22E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.16E+02
Annual dis. conta. qt (based on runoff) (g):	1.02E+02

DRAFT

NE ON-SITE	CHEMICAL: U(TOTAL)	Baseline	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:27

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	2.47E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	4.550E+04	3.109E+01
Total	4.550E+04	3.109E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U(TOTAL) in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.47E+01
Single storm adsorbed contaminant quantity PXi (g):	6.34E+00
Annual adsorbed contaminant quantity (g):	5.76E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.86E-03
Single storm dissolved contaminant quantity PQi (g):	2.11E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.92E+02
Annual dis. conta. qt (based on runoff) (g):	3.47E+01

DRAFT

000880

SUBBASIN NE ALL **CHEMICAL:** U-234 Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:27

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222.0441	0.000167	2.29E-01
NEb	222.0441	0.001302894	4.90E-02

Area	Ss (g)	Ds (g)
NEa	1.435E+00	9.807E-04
NEb	2.396E+00	1.637E-03
Total	3.831E+00	2.618E-03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U-234 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	3.67E-04
Single storm adsorbed contaminant quantity PXi (g):	3.32E-04
Annual adsorbed contaminant quantity (g):	1.16E-02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.76E-08
Single storm dissolved contaminant quantity PQi (g):	3.25E-04
Annual dis. conta. qt (based on sediment yield)(g):	1.13E-02
Annual dis. conta. qt (based on runoff) (g):	5.35E-03

DRAFT

NE ON-SITE	CHEMICAL: U-234	Baseline	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:27

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	1.30E-03	4.90E-02

Area	Ss (g)	Ds (g)
NEb	2.396E+00	1.637E-03
Total	2.396E+00	1.637E-03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U-234 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.30E-03
Single storm adsorbed contaminant quantity PXi (g):	3.34E-04
Annual adsorbed contaminant quantity (g):	3.03E-02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.03E-07
Single storm dissolved contaminant quantity PQi (g):	1.11E-04
Annual dis. conta. qt (based on sediment yield)(g):	1.01E-02
Annual dis. conta. qt (based on runoff) (g):	1.82E-03

DRAFT

000882

SUBBASIN NE ALL **CHEMICAL:** U-235/236 Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222	0.0411	2.29E-01
NEb	222	0.324074074	4.90E-02

Area	Ss (g)	Ds (g)
NEa	3.532E+02	2.414E-01
NEb	5.959E+02	4.073E-01
Total	9.492E+02	6.487E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U-235/236 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.09E-02
Single storm adsorbed contaminant quantity PXi (g):	8.23E-02
Annual adsorbed contaminant quantity (g):	2.86E+00

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.43E-05
Single storm dissolved contaminant quantity PQi (g):	8.04E-02
Annual dis. conta. qt (based on sediment yield)(g):	2.80E+00
Annual dis. conta. qt (based on runoff) (g):	1.33E+00

DRAFT

NE ON-SITE	CHEMICAL: U-235/236	Baseline	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	3.24E-01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	5.959E+02	4.073E-01
Total	5.959E+02	4.073E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U-235/236 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	3.24E-01
Single storm adsorbed contaminant quantity PXi (g):	8.31E-02
Annual adsorbed contaminant quantity (g):	7.55E+00

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.05E-05
Single storm dissolved contaminant quantity PQi (g):	2.77E-02
Annual dis. conta. qt (based on sediment yield)(g):	2.52E+00
Annual dis. conta. qt (based on runoff) (g):	4.54E-01

DRAFT

SUBBASIN NE ALL **CHEMICAL:** U-238 Baseline Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222	3.24	2.29E-01
NEb	222	24.59821429	4.90E-02

Area	Ss (g)	Ds (g)
NEa	2.785E+04	1.903E+01
NEb	4.523E+04	3.092E+01
Total	7.308E+04	4.995E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U-238 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	7.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.34E+00
Annual adsorbed contaminant quantity (g):	2.20E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.10E-03
Single storm dissolved contaminant quantity PQi (g):	6.19E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.15E+02
Annual dis. conta. qt (based on runoff) (g):	1.02E+02

DRAFT

NE ON-SITE | CHEMICAL: U-238 | Baseline | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	2.46E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	4.523E+04	3.092E+01
Total	4.523E+04	3.092E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U-238 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.46E+01
Single storm adsorbed contaminant quantity PXi (g):	6.31E+00
Annual adsorbed contaminant quantity (g):	5.73E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.84E-03
Single storm dissolved contaminant quantity PQi (g):	2.10E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.91E+02
Annual dis. conta. qt (based on runoff) (g):	3.45E+01

DRAFT

SUBBASIN NE ALL **CHEMICAL:** Ce-137 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:36

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	9038.054	5.1E-09	2.29E-01
NEb	9038.054	1.99801E-09	4.90E-02

Area	Ss (g)	Ds (g)
NEa	4.386E-05	7.363E-10
NEb	3.677E-06	6.172E-11
Total	4.754E-05	7.980E-10

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

Ce-137 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.55E-09
Single storm adsorbed contaminant quantity PXi (g):	4.12E-09
Annual adsorbed contaminant quantity (g):	1.43E-07

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.76E-14
Single storm dissolved contaminant quantity PQi (g):	9.90E-11
Annual dis. conta. qt (based on sediment yield)(g):	3.44E-09
Annual dis. conta. qt (based on runoff) (g):	1.63E-09

DRAFT

NE ON-SITE | CHEMICAL: Ce-137 | Future | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:36

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	9.04E+03	2.00E-09	4.90E-02

Area	Ss (g)	Ds (g)
NEb	3.677E-06	6.172E-11
Total	3.677E-06	6.172E-11

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

Ce-137 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.00E-09
Single storm adsorbed contaminant quantity PXi (g):	5.12E-10
Annual adsorbed contaminant quantity (g):	4.66E-08

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	7.66E-15
Single storm dissolved contaminant quantity PQi (g):	4.20E-12
Annual dis. conta. qt (based on sediment yield)(g):	3.81E-10
Annual dis. conta. qt (based on runoff) (g):	6.88E-11

DRAFT

SUBBASIN NE ALL **CHEMICAL:** SR-90 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:37

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	54.54931	0	2.29E-01
NEb	54.54931	4.81718E-09	4.90E-02

Area	Ss (g)	Ds (g)
NEa	0.000E+00	0.000E+00
NEb	8.840E-06	2.459E-08
Total	8.840E-06	2.459E-08

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

SR-90 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	8.47E-10
Single storm adsorbed contaminant quantity PXi (g):	7.67E-10
Annual adsorbed contaminant quantity (g):	2.67E-08

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.41E-13
Single storm dissolved contaminant quantity PQi (g):	3.05E-09
Annual dis. conta. qt (based on sediment yield)(g):	1.06E-07
Annual dis. conta. qt (based on runoff) (g):	5.03E-08

DRAFT

NE ON-SITE	CHEMICAL: SR-90	Future	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:37

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	5.45E+01	4.82E-09	4.90E-02

Area	Ss (g)	Ds (g)
NEb	8.840E-06	2.459E-08
Total	8.840E-06	2.459E-08

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

SR-90 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.80E-09
Single storm adsorbed contaminant quantity PXi (g):	1.23E-09
Annual adsorbed contaminant quantity (g):	1.12E-07

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.05E-12
Single storm dissolved contaminant quantity PQi (g):	1.67E-09
Annual dis. conta. qt (based on sediment yield)(g):	1.52E-07
Annual dis. conta. qt (based on runoff) (g):	2.74E-08

DRAFT

000890

SUBBASIN NE ALL **CHEMICAL:** TH-232 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:37

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	5800	9.82	2.29E-01
NEb	5800	10.37272724	4.90E-02

Area	Ss (g)	Ds (g)
NEa	8.445E+04	2.209E+00
NEb	1.909E+04	4.993E-01
Total	1.035E+05	2.708E+00

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

TH-232 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.92E+00
Single storm adsorbed contaminant quantity PXi (g):	8.98E+00
Annual adsorbed contaminant quantity (g):	3.12E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.96E-05
Single storm dissolved contaminant quantity PQi (g):	3.36E-01
Annual dis. conta. qt (based on sediment yield)(g):	1.17E+01
Annual dis. conta. qt (based on runoff) (g):	5.54E+00

DRAFT

NE ON-SITE CHEMICAL: TH-232 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:37

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	5.80E+03	1.04E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	1.909E+04	4.993E-01
Total	1.909E+04	4.993E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

TH-232 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.04E+01
Single storm adsorbed contaminant quantity PXi (g):	2.66E+00
Annual adsorbed contaminant quantity (g):	2.42E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	6.20E-05
Single storm dissolved contaminant quantity PQi (g):	3.40E-02
Annual dis. conta. qt (based on sediment yield)(g):	3.08E+00
Annual dis. conta. qt (based on runoff) (g):	5.56E-01

DRAFT

000892

SUBBASIN NE ALL **CHEMICAL:** U(TOTAL) Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:37

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222	3.24	2.29E-01
NEb	222	24.74	4.90E-02

Area	Ss (g)	Ds (g)
NEa	2.785E+04	1.903E+01
NEb	4.550E+04	3.109E+01
Total	7.334E+04	5.012E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U(TOTAL) in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	7.02E+00
Single storm adsorbed contaminant quantity PXi (g):	6.36E+00
Annual adsorbed contaminant quantity (g):	2.21E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.10E-03
Single storm dissolved contaminant quantity PQi (g):	6.22E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.16E+02
Annual dis. conta. qt (based on runoff) (g):	1.02E+02

DRAFT

NE ON-SITE	CHEMICAL: U(TOTAL)	Future	Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:37

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	2.47E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	4.550E+04	3.109E+01
Total	4.550E+04	3.109E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U(TOTAL) in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.47E+01
Single storm adsorbed contaminant quantity PXi (g):	6.34E+00
Annual adsorbed contaminant quantity (g):	5.76E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.86E-03
Single storm dissolved contaminant quantity PQi (g):	2.11E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.92E+02
Annual dis. conta. qt (based on runoff) (g):	3.47E+01

DRAFT

000894

SUBBASIN NE ALL **CHEMICAL:** U-234 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:38

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222.0441	0.000167	2.29E-01
NEb	222.0441	0.001302635	4.90E-02

Area	Ss (g)	Ds (g)
NEa	1.435E+00	9.807E-04
NEb	2.395E+00	1.637E-03
Total	3.831E+00	2.618E-03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U-234 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	3.67E-04
Single storm adsorbed contaminant quantity PXi (g):	3.32E-04
Annual adsorbed contaminant quantity (g):	1.15E-02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.76E-08
Single storm dissolved contaminant quantity PQi (g):	3.25E-04
Annual dis. conta. qt (based on sediment yield)(g):	1.13E-02
Annual dis. conta. qt (based on runoff) (g):	5.35E-03

DRAFT

NE ON-SITE | CHEMICAL: U-234 | Future | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:38

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	1.30E-03	4.90E-02

Area	Ss (g)	Ds (g)
NEb	2.395E+00	1.637E-03
Total	2.395E+00	1.637E-03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U-234 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.30E-03
Single storm adsorbed contaminant quantity PXi (g):	3.34E-04
Annual adsorbed contaminant quantity (g):	3.03E-02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.03E-07
Single storm dissolved contaminant quantity PQi (g):	1.11E-04
Annual dis. conta. qt (based on sediment yield)(g):	1.01E-02
Annual dis. conta. qt (based on runoff) (g):	1.82E-03

DRAFT

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SUBBASIN NE ALL **CHEMICAL:** U-235/236 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:38

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222	0.0411	2.29E-01
NEb	222	0.324074074	4.90E-02

Area	Ss (g)	Ds (g)
NEa	3.532E+02	2.414E-01
NEb	5.959E+02	4.073E-01
Total	9.492E+02	6.487E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U-235/236 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.09E-02
Single storm adsorbed contaminant quantity PXi (g):	8.23E-02
Annual adsorbed contaminant quantity (g):	2.86E+00

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.43E-05
Single storm dissolved contaminant quantity PQi (g):	8.04E-02
Annual dis. conta. qt (based on sediment yield)(g):	2.80E+00
Annual dis. conta. qt (based on runoff) (g):	1.33E+00

DRAFT

NE ON-SITE | CHEMICAL: U-235/236 | Future | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:38

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	3.24E-01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	5.959E+02	4.073E-01
Total	5.959E+02	4.073E-01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U-235/236 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	3.24E-01
Single storm adsorbed contaminant quantity PXi (g):	8.31E-02
Annual adsorbed contaminant quantity (g):	7.55E+00

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	5.05E-05
Single storm dissolved contaminant quantity PQi (g):	2.77E-02
Annual dis. conta. qt (based on sediment yield)(g):	2.52E+00
Annual dis. conta. qt (based on runoff) (g):	4.54E-01

DRAFT

SUBBASIN NE ALL **CHEMICAL:** U-238 Future Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 6/18/94 17:39

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.78E-01
SCS curve number:	65.4

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.31
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.01
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.08

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEa	222	3.24	2.29E-01
NEb	222	24.59821429	4.90E-02

Area	Ss (g)	Ds (g)
NEa	2.785E+04	1.903E+01
NEb	4.523E+04	3.092E+01
Total	7.308E+04	4.995E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (NE) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.06E-01
Annual sediment yield Y(S)a (tonne/yr):	7.87E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.28E+06

U-238 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	7.00E+00
Single storm adsorbed contaminant quantity PXi (g):	6.34E+00
Annual adsorbed contaminant quantity (g):	2.20E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.10E-03
Single storm dissolved contaminant quantity PQi (g):	6.19E+00
Annual dis. conta. qt (based on sediment yield)(g):	2.15E+02
Annual dis. conta. qt (based on runoff) (g):	1.02E+02

DRAFT

NE ON-SITE | CHEMICAL: U-238 | Future | Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS:

Date: 6/18/94 17:39

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.90E-02
SCS curve number:	59.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.94E+04
Total storm runoff Qr (in):	0.17
Peak flow rate qp (cfs):	1.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.300

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	2.79

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
NEb	2.22E+02	2.46E+01	4.90E-02

Area	Ss (g)	Ds (g)
NEb	4.523E+04	3.092E+01
Total	4.523E+04	3.092E+01

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.57E-01
Annual sediment yield Y(S)a (tonne/yr):	5.83E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.94E+04
Annual runoff volume (cf):	3.17E+05

U-238 in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	2.46E+01
Single storm adsorbed contaminant quantity PXi (g):	6.31E+00
Annual adsorbed contaminant quantity (g):	5.73E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.84E-03
Single storm dissolved contaminant quantity PQi (g):	2.10E+00
Annual dis. conta. qt (based on sediment yield)(g):	1.91E+02
Annual dis. conta. qt (based on runoff) (g):	3.45E+01

DRAFT

F.2.V Attachment

Attachment F.2.V

Surface Water Model Outputs
Current Conditions

PADDYS RUN BASIN | CHEMICAL: U-TOTAL W/O SAMPLES | SCENARIO: WITHOUT STORMWATER CONTROLS current

SURFACE WATER MODEL INPUTS: Investigator: DCW Date: 6/18/94 16:20

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.42E-02	6.86E+01	1.70E+05	2.00E-01	2.85E-03
WPA	1.18E+00	4.02E+03	1.20E+05	5.09E-01	6.02E-01
Sub570	2.35E-02	1.32E+02	1.99E+05	6.25E-01	1.47E-02
Sub575	3.13E-03	1.09E+01	1.23E+05	2.11E-01	6.61E-04
Sub580	1.91E-03	2.35E+00	4.34E+04	4.40E-02	8.41E-05
PDAR	6.33E-01	1.27E+04	7.06E+05	9.28E-01	5.88E-01
Sub581	4.39E-02	5.58E+02	4.49E+05	4.17E-01	1.83E-02
Sub582	1.60E-03	1.66E+01	3.68E+05	2.97E-01	4.74E-04

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.42E-02	6.86E+01	4.43E+01
WPA & sub570	4.59E-01	4.15E+03	2.75E+02
sub575	3.13E-03	1.09E+01	1.95E+01
Sub 580,PDAR, 581 & 582	2.98E-01	1.32E+04	1.93E+02

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.59E+02	2.75E+02
D-D	4.59E+02	2.75E+02
E-E	4.59E+02	2.75E+02
Max:	4.59E+02	2.75E+02

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	5.56E+01
Avg. Conc. in GMR (ug/l)	5.84E+00
Max. Conc. in Paddys Run at GMR (ug/l)	3.84E+02
Max. Conc. in GMR (ug/l)	4.03E+01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	2.30E+02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	2.41E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.06E+03	1.16E+00	8.08E+01
D-E	7.5	11.3	13.9		4.76E+02	5.21E-01	4.44E+01
E-F	0.6	1.4	1.0	1.1	2.04E+02	2.24E-01	2.27E+01
SSOD				49.2	6.51E+03	7.14E+00	2.62E+02
TOTAL					8.25E+03		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.64E+04	5.65E-01	2.79E-01
D-E	2.08E+04	2.53E-01	1.25E-01
E-F	7.53E+03	9.16E-02	4.52E-02
SSOD	2.08E+05	2.54E+00	1.25E+00
TOTAL	2.83E+05	3.45E+00	1.70E+00

CPC SCREENING U-TOTAL W/O SAMPLES RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.42E-02	NO	1.42E+01	NO	Sub580	1.91E-03	YES	1.91E+00	YES
WPA	1.18E+00	NO	7.77E+01	NO	PDAR	6.33E-01	NO	2.62E+02	NO
Sub570	2.35E-02	NO	2.35E+01	NO	Sub581	4.39E-02	NO	4.39E+01	NO
Sub575	3.13E-03	YES	3.13E+00	YES	Sub582	1.60E-03	YES	1.60E+00	YES

DRAFT

PADDYS RUN BASIN | CHEMICAL: U-TOTAL W/O SAMPLES | SCENARIO: WITH STORMWATER CONTROLS CURRENT

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/26/94 14:28

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.42E-02	6.86E+01	1.70E+05	2.00E-01	2.85E-03
Sub570	2.35E-02	1.32E+02	1.99E+05	9.68E-01	2.27E-02
Sub575	3.13E-03	1.09E+01	1.23E+05	2.62E-01	8.21E-04
Sub580	1.91E-03	2.35E+00	4.34E+04	1.28E-01	2.45E-04
Sub581	4.39E-02	5.58E+02	4.49E+05	9.06E-01	3.98E-02
Sub582	1.60E-03	1.66E+01	3.68E+05	4.35E-01	6.95E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.42E-02	6.86E+01	4.43E+01
Sub570	2.35E-02	1.32E+02	1.62E+02
sub575	3.13E-03	1.09E+01	1.95E+01
Sub 580, 581 & 582	2.37E-02	5.77E+02	4.45E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.28E+01	1.57E+02
D-D	2.28E+01	1.57E+02
E-E	2.35E+01	1.57E+02
Max:	2.35E+01	1.57E+02

Great Miami River

	ug/l
Avg. Conc. in Paddys Run at GMR	2.70E+00
Avg. Conc. in GMR	2.71E-01
Max. Conc. in Paddys Run at GMR	1.94E+01
Max. Conc. in GMR at Paddys Run	1.95E+00
Max. Conc. in GMR at Eff. Line (max week)	1.09E+00
Annual Conc. at Eff. Line	2.92E-01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.30E+02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.30E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta89	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug
C-D	20.6	25.2			4.75E+01	5.20E-02	3.87E+00
D-E	7.5	11.1	13.9		2.13E+01	2.34E-02	2.07E+00
E-F	0.7	1.6	1.1	1.5	1.14E+01	1.25E-02	1.29E+00
SSOD				56.6	3.27E+02	3.58E-01	1.94E+01
TOTAL					4.07E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.51E+03	4.27E-02	2.11E-02
D-E	1.55E+03	1.88E-02	9.28E-03
E-F	4.32E+02	5.25E-03	2.59E-03
SSOD	9.27E+03	1.13E-01	5.56E-02
TOTAL	1.48E+04	1.80E-01	8.86E-02

CPC SCREENING | U-TOTAL W/O SAMPLES RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.42E-02	NO	3.84E+00	YES	Sub580	1.91E-03	YES	1.91E+00	YES
Sub570	2.35E-02	NO	3.84E+00	YES	Sub581	4.39E-02	NO	1.94E+01	NO
Sub575	3.13E-03	YES	3.13E+00	YES	Sub582	1.60E-03	YES	1.60E+00	YES

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CHEMICAL: U-TOTAL W/O SAMPLES CURRENT

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.43E+01	4.64E+02	1.62E+02	1.95E+01
Single storm adsorbed contaminant quantity PXi (g):	4.15E+02	1.95E+03	7.19E+02	4.32E+01
Annual adsorbed contaminant quantity (g):	1.79E+04	1.48E+04	6.46E+03	7.22E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.42E-02	1.18E+00	2.35E-02	3.13E-03
Single storm dissolved contaminant quantity PQi (g):	6.86E+01	4.02E+03	1.32E+02	1.09E+01
Annual dis. conta. qt (based on sediment yield)(g):	2.97E+03	3.05E+04	1.19E+03	1.82E+02
Annual dis. conta. qt (based on runoff) (g):	1.12E+03	6.70E+04	2.22E+03	1.82E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.34E+01	3.73E+02	7.61E+01	9.47E+00
Single storm adsorbed contaminant quantity PXi (g):	6.85E+01	2.96E+03	6.62E+03	9.06E+01
Annual adsorbed contaminant quantity (g):	1.07E+03	9.75E+03	1.10E+05	2.34E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.91E-03	6.33E-01	4.39E-02	1.60E-03
Single storm dissolved contaminant quantity PQi (g):	2.35E+00	1.27E+04	5.58E+02	1.66E+01
Annual dis. conta. qt (based on sediment yield)(g):	3.66E+01	4.17E+04	9.29E+03	4.30E+02
Annual dis. conta. qt (based on runoff) (g):	3.86E+01	2.10E+05	9.28E+03	2.85E+02

investigator DCW

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CPC= U-TOTAL W/O SAMPLES
Risk Criteria (ug/l) 11

AREA	Kd (l/Kg)	Concentration (mg/kg)	comment CURRENT
560A	2.22E+02	1.35E+01	
560B	2.22E+02	1.52E+02	
560C	1.50E+01	2.58E+02	
SWL	7.50E+01	2.30E+02	
560D	2.22E+02	1.74E+02	
570A	2.22E+02	8.84E+01	
570B	2.22E+02	1.10E+02	
570C	2.22E+02	3.50E+01	
570D	2.22E+02	5.89E+02	
570E	2.22E+02	4.75E+01	
575A	2.22E+02	1.43E+01	
575B	2.22E+02	5.88E+01	
SF	1.77E+02	2.74E+01	
580A	2.22E+02	1.35E+01	
581A	2.22E+02	1.83E+01	
581B	2.22E+02	2.17E+02	
581C	2.22E+02	4.00E+01	
581D	1.50E+01	1.26E+03	
582A	2.22E+02	8.59E+00	
582B	2.22E+02	9.39E+01	
AFP	3.75E+01	1.07E+01	
PAA	1.50E+01	1.23E+03	
PAB	1.50E+01	7.23E+02	
PAC	1.50E+01	3.72E+02	
PAD	1.50E+01	1.25E+02	
PAE	1.50E+01	2.64E+02	
PAF	2.22E+02	1.68E+02	
PAG	2.22E+02	2.13E+03	
PAH	2.22E+02	4.47E+01	
PAI	2.22E+02	2.41E+01	
LSP	2.65E+03	1.98E+02	
WPAA	2.22E+02	1.61E+02	
WPA.OU1	1.20E+01	728	
WPA.OU4	1.20E+01	357	

000905

SUBBASIN 560 **CHEMICAL:** U-TOTAL W/O SAMPLE CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	3.17E-01
SCS curve number:	62.6

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.70E+05
Total storm runoff Qr (in):	0.23
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.43
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.900

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	3.77

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
560a	2.22E+02	1.35E+01	2.51E-01
560b	2.22E+02	1.52E+02	5.60E-02
560c	1.50E+01	2.58E+02	4.00E-03
560d	2.22E+02	1.74E+02	4.00E-03
SWL	7.50E+01	2.30E+02	2.00E-03

Area	Ss (g)	Ds (g)
560a	1.268E+05	8.665E+01
560b	3.186E+05	2.178E+02
560c	3.837E+04	3.881E+02
560d	2.619E+04	1.790E+01
SWL	1.724E+04	3.488E+01
Total	5.272E+05	7.453E+02

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

Concentration from areas 560b, 560c, and SWL (ug/l)	60.45
Sediment Conc. areas 560b, 560c, and SWL (mg/kg)	162

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.36E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.70E+05
Annual runoff volume (cf):	2.78E+06

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.43E+01
Single storm adsorbed contaminant quantity PXi (g):	4.15E+02
Annual adsorbed contaminant quantity (g):	1.79E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.42E-02
Single storm dissolved contaminant quantity PQi (g):	6.86E+01
Annual dis. conta. qt (based on sediment yield)(g):	2.97E+03
Annual dis. conta. qt (based on runoff) (g):	1.12E+03

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000506

SUBBASIN WPA **CHEMICAL:** U-TOTAL W/O SAMPLE CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	7.20E-02
SCS curve number:	76.85

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.20E+05
Total storm runoff Qr (in):	0.73
Peak flow rate qp (cfs):	2.70E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.280

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.29

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	11.97

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.48
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
WPAa	2.22E+02	1.61E+02	2.90E-02
WPAou1	1.20E+01	7.28E+02	3.70E-02
WPAou4	1.20E+01	3.57E+02	6.00E-03

Area	Ss (g)	Ds (g)
WPAa	1.785E+05	1.195E+02
WPAou1	1.020E+06	1.263E+04
WPAou4	8.110E+04	1.005E+03
Total	1.279E+06	1.376E+04

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (WPA) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	4.21E+00
Annual sediment yield Y(S)a (tonne/yr):	9.11E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.20E+05
Annual runoff volume (cf):	2.00E+06

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.64E+02
Single storm adsorbed contaminant quantity PXi (g):	1.95E+03
Annual adsorbed contaminant quantity (g):	1.48E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.18E+00
Single storm dissolved contaminant quantity PQi (g):	4.02E+03
Annual dis. conta. qt (based on sediment yield)(g):	3.05E+04
Annual dis. conta. qt (based on runoff) (g):	6.70E+04

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0009008

```
ROC Step3
PARAMETER whichdbf

SELECT (whichdbf)
INDEX ON para+boring+DTOC(sampdate) TAG DateBore
GO TOP
m.cnt           =   0
m.rec           =   RECCOUNT()
m.bestRec   = RECNO()
m.Borepara= boring+para
m.result  = ''
m.qual      = ''
m.sampdate= sampdate

SET DELETED OFF

? "Determining which UNF non93/task result to use."
DO WHILE ! EOF()

    WAIT WIND NOWAIT "Combining 93/task data with other
    data..."+STR(m.cnt)+" out of:"+STR(m.rec)
    DELETE
    DO CASE
        CASE boring+para==m.borePara
            DO eval_qual
        CASE boring+para<>m.borePara
            m.lastRec   = RECNO()
            GOTO m.BestRec
            RECALL
            REPLACE FinalMax WITH result
            GOTO m.lastRec
            m.BorePara = boring+para
            m.bestrec = RECNO()
            m.result    = result
            m.sampdate= sampdate
            m.qual      = qual
        OTHERWISE
            WAIT WIND "Boring-Para mismatch. Error in Step4. Call
            programmer."
            SUSP
    ENDCASE
    SKIP

    m.cnt=m.cnt+1
    IF EOF()
        GOTO m.BestRec
        RECALL
        EXIT
    ENDIF

ENDDO

SET DELETED ON

ROC Eval_Qual

*** take anything over nothing
IF EMPTY(qual) AND result>m.result
    m.BestRec [illegible] ECNO()
    m.sampdate [illegible] ampdate
```

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```
    m.result        = result
    m.qual          = qual
ENDIF

*** take anything with a qual over and RZ
IF ALLTRIM(m.qual)$"RZ" AND NOT ALLTRIM(qual)$"RZ"
    m.BestRec   = RECNO()
    m.sampdate  = sampdate
    m.result        = result
    m.qual          = qual
ENDIF

*** take anything over an NV except RZ
IF "NV"$m.qual AND sampdate>m.sampdate AND NOT ALLTRIM(qual)$'RZ'
    m.BestRec   = RECNO()
    m.sampdate  = sampdate
    m.result        = result
    m.qual          = qual
ENDIF

*** take most recent nonsnapshot, validated over any qualifier
IF NOT EMPTY(qual) AND NOT "NV"$qual AND sampdate>m.sampdate AND NOT
ALLTRIM(qual)$'RZ'
    m.BestRec   = RECNO()
    m.sampdate  = sampdate
    m.result        = result
    m.qual          = qual
ENDIF
```

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6161

SUBBASIN 570 **CHEMICAL:** U-TOTAL W/O SAMPLE CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	1.20E-01
SCS curve number:	76.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.73
Peak flow rate qp (cfs):	3.00E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.53
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.190

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.27

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	11.97

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.20
Soil bulk density(g/cm^3):	1.33
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
570a	2.22E+02	8.84E+01	5.80E-02
570b	2.22E+02	1.10E+02	1.80E-02
570c	2.22E+02	3.50E+01	4.00E-03
570d	2.22E+02	5.89E+02	1.90E-02
570e	2.22E+02	4.75E+01	2.10E-02

Area	Ss (g)	Ds (g)
570a	1.765E+05	1.196E+02
570b	6.828E+04	4.625E+01
570c	4.819E+03	3.264E+00
570d	3.850E+05	2.608E+02
570e	3.434E+04	2.326E+01
Total	6.690E+05	4.532E+02

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (570) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	4.44E+00
Annual sediment yield Y(S)a (tonne/yr):	1.07E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.34E+06

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.62E+02
Single storm adsorbed contaminant quantity PXi (g):	7.19E+02
Annual adsorbed contaminant quantity (g):	6.46E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.35E-02
Single storm dissolved contaminant quantity PQi (g):	1.32E+02
Annual dis. conta. qt (based on sediment yield)(g):	1.19E+03
Annual dis. conta. qt (based on runoff) (g):	2.22E+03

DRAFT 000910

SUBBASIN 575 **CHEMICAL:** **U-TOTAL W/O SAMPLE CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	1.20E-01
SCS curve number:	69.82

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.23E+05
Total storm runoff Qr (in):	0.45
Peak flow rate qp (cfs):	1.60E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.52
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.180

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.30

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	7.38

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.21
Soil bulk density(g/cm^3):	1.36
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
575a	2.22E+02	1.43E+01	9.20E-02
575b	2.22E+02	5.88E+01	8.00E-03
SF	1.77E+02	2.74E+01	2.00E-02

Area	Ss (g)	Ds (g)
575a	4.644E+04	3.230E+01
575b	1.656E+04	1.152E+01
SF	1.929E+04	1.682E+01
Total	8.228E+04	6.064E+01

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (575) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.11E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.23E+05
Annual runoff volume (cf):	2.06E+06

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.95E+01
Single storm adsorbed contaminant quantity PXi (g):	4.32E+01
Annual adsorbed contaminant quantity (g):	7.22E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.13E-03
Single storm dissolved contaminant quantity PQi (g):	1.09E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.82E+02
Annual dis. conta. qt (based on runoff) (g):	1.82E+02

000911

DRAFT

SUBBASIN 580 **CHEMICAL:** U-TOTAL W/O SAMPLE CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	3.60E-02
SCS curve number:	71.95

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	4.34E+04
Total storm runoff Qr (in):	0.52
Peak flow rate qp (cfs):	6.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonne/ha/Rr):	0.56
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	1.200

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.29

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	8.53

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.20
Soil bulk density(g/cm^3):	1.36
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
580a	2.22E+02	1.35E+01	3.60E-02

Area	Ss (g)	Ds (g)
580a	1.704E+04	1.129E+01
Total	1.704E+04	1.129E+01

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (580) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	5.10E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	4.34E+04
Annual runoff volume (cf):	7.13E+05

U-TOTAL W/O SAMPLES in the Runoff:

ABSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.34E+01
Single storm adsorbed contaminant quantity PXi (g):	6.85E+01
Annual adsorbed contaminant quantity (g):	1.07E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.91E-03
Single storm dissolved contaminant quantity PQi (g):	2.35E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.66E+01
Annual dis. conta. qt (based on runoff) (g):	3.86E+01

DRAFT

SUBBASIN PDAR **CHEMICAL:** **U-TOTAL W/O SAMPL CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.44E-01
SCS curve number:	86.2

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	7.06E+05
Total storm runoff Qr (in):	1.26
Peak flow rate qp (cfs):	1.80E+02
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	0.50
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.135

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr):	303.60
Sediment delivery ratio Sd:	0.45

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	20.66

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.40
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
PAa	1.50E+01	1.23E+03	1.90E-02
PAb	1.50E+01	7.23E+02	4.10E-02
PAc	1.50E+01	3.72E+02	1.40E-02
PAd	1.50E+01	1.25E+02	8.00E-03
PAe	1.50E+01	2.64E+02	2.20E-02
PAf	2.22E+02	1.68E+02	1.60E-02
PAg	2.22E+02	2.13E+03	9.00E-03
PAh	2.22E+02	4.47E+01	7.90E-02
PAi	2.22E+02	2.41E+01	3.30E-02
LSP	2.65E+03	1.98E+02	3.00E-03

Area	Ss (g)	Ds (g)
PAa	8.395E+05	8.794E+03
PAb	1.064E+06	1.114E+04
PAc	1.869E+05	1.958E+03
PAd	3.586E+04	3.756E+02
PAe	2.081E+05	2.180E+03
PAf	9.748E+04	6.900E+01
PAg	6.943E+05	4.914E+02
PAh	1.280E+05	9.057E+01
PAi	2.885E+04	2.042E+01
LSP	2.154E+04	1.277E+00
Total	3.304E+06	2.512E+04

Concentration excluding area PAI (ug/l)

7.32E+02

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (PDAR) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	7.92E+00
Annual sediment yield Y(S)a (tonne/yr):	1.17E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	7.06E+05
Annual runoff volume (cf):	1.17E+07

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	3.73E+02
Single storm adsorbed contaminant quantity PXi (g):	2.96E+03
Annual adsorbed contaminant quantity (g):	9.75E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	6.33E-01
Single storm dissolved contaminant quantity PQi (g):	1.27E+04
Annual dis. conta. qt (based on sediment yield)(g):	4.17E+04
Annual dis. conta. qt (based on runoff) (g):	2.10E+05

SUBBASIN 581 **CHEMICAL:** U-TOTAL W/O SAMPLE CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:28

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.56E-01
SCS curve number:	69.43

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	4.49E+05
Total storm runoff Qr (in):	0.43
Peak flow rate qp (cfs):	4.80E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	2.000

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.23

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	7.05

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.23
Soil bulk density(g/cm^3):	1.48
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
581a	2.22E+02	1.83E+01	3.23E-01
581b	2.22E+02	2.17E+02	9.90E-02
581c	2.22E+02	4.00E+01	2.90E-02
581d	1.50E+01	1.26E+03	5.00E-03

Area	Ss (g)	Ds (g)
581a	2.258E+05	1.581E+02
581b	8.212E+05	5.749E+02
581c	4.442E+04	3.110E+01
581d	2.396E+05	2.482E+03
Total	1.331E+06	3.246E+03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

Concentration from areas 581b, 581c, and 581d (ug/l)	143.22
Sediment Conc. areas 560b, 560c, and SWL (mg/kg)	217

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (581) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	8.69E+01
Annual sediment yield Y(S)a (tonne/yr):	3.33E+02

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	4.49E+05
Annual runoff volume (cf):	7.47E+06

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	7.61E+01
Single storm adsorbed contaminant quantity PXi (g):	6.62E+03
Annual adsorbed contaminant quantity (g):	1.10E+05

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	4.39E-02
Single storm dissolved contaminant quantity PQi (g):	5.58E+02
Annual dis. conta. qt (based on sediment yield)(g):	9.29E+03
Annual dis. conta. qt (based on runoff) (g):	9.28E+03

DRAFT

SUBBASIN 582 **CHEMICAL:** **U-TOTAL W/O SAMPLE CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.87E-01
SCS curve number:	66.53

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	3.68E+05
Total storm runoff Qr (in):	0.34
Peak flow rate qp (cfs):	3.00E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.320

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr):	303.60
Sediment delivery ratio Sd:	0.21

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.58

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.41
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
582a	2.22E+02	8.59E+00	4.79E-01
582b	2.22E+02	9.39E+01	5.00E-03
AFP	3.75E+01	1.07E+01	3.00E-03

Area	Ss (g)	Ds (g)
582a	1.501E+05	1.055E+02
582b	1.713E+04	1.204E+01
AFP	1.167E+03	4.857E+00
Total	1.684E+05	1.224E+02

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

Concentration from areas 582b, and AFP (ug/l)

13.42

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (582) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	5.19E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	3.68E+05
Annual runoff volume (cf):	6.31E+06

U-TOTAL W/O SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.47E+00
Single storm adsorbed contaminant quantity PXi (g):	9.06E+01
Annual adsorbed contaminant quantity (g):	2.34E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.60E-03
Single storm dissolved contaminant quantity PQi (g):	1.66E+01
Annual dis. conta. qt (based on sediment yield)(g):	4.30E+
Annual dis. conta. qt (based on runoff) (g):	2.85E+02

000915

DRAFT

PADDYS RUN BASIN | CHEMICAL: U-TOTAL W/SAMPLES | SCENARIO: WITHOUT STORMWATER CONTROLS current

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 6/18/94 16:22

Subbasin	Ce Dissolved Conc. (mg/l)	PQI Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.42E-02	6.86E+01	1.70E+05	2.00E-01	2.85E-03
WPA	1.18E+00	4.02E+03	1.20E+05	5.09E-01	6.02E-01
Sub570	2.35E-02	1.32E+02	1.99E+05	6.25E-01	1.47E-02
Sub575	3.13E-03	1.09E+01	1.23E+05	2.11E-01	6.61E-04
Sub580	1.91E-03	2.35E+00	4.34E+04	4.40E-02	8.41E-05
PDAR	9.14E-01	1.83E+04	7.06E+05	9.28E-01	8.48E-01
Sub581	4.39E-02	5.58E+02	4.49E+05	4.17E-01	1.83E-02
Sub582	1.60E-03	1.66E+01	3.68E+05	2.97E-01	4.74E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	0.0	qp(Rout25)	416.0
qp70CT	53.0	QSTA130(Rout25)	454.0
QSTA70(570-WPA)	53.0		
QROUT1	31.0	qp(Rout27)	370.0
qp575	16.0	QSTA100(Rout27)	378.0
QSTA75(575)	76.0		
QROUT2	3.0	qp(Rout3)	378.0
qpSTA80	196.0	QSTA120(Rout3)	406.0
QSTAEE(SSOD1)	199.0		
qpPADDY	406.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.11E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.42E-02	6.86E+01	4.43E+01
WPA & sub570	4.59E-01	4.15E+03	2.75E+02
sub575	3.13E-03	1.09E+01	1.95E+01
Sub 580,PDAR, 581 & 582	4.25E-01	1.88E+04	2.76E+02

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations — Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	4.59E+02	2.75E+02
D-D	4.59E+02	2.75E+02
E-E	4.59E+02	2.76E+02
Max	4.59E+02	2.76E+02

Loading to the Great Miami Aquifer — Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from WPA & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sta80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			1.06E+03	1.16E+00	8.08E+01
D-E	7.5	11.3	13.9		4.76E+02	5.21E-01	4.44E+01
E-F	0.6	1.4	1.0	1.1	2.66E+02	2.91E-01	2.95E+01
SSOD				49.2	9.27E+03	1.02E+01	3.73E+02
TOTAL					1.11E+04		

Great Miami River

Avg. Conc. in Paddys Run at GMR (ug/l)	7.34E+01
Avg. Conc. in GMR (ug/l)	7.71E+00
Max. Conc. in Paddys Run at GMR (ug/l)	3.84E+02
Max. Conc. in GMR (ug/l)	4.03E+01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	2.31E+02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	2.42E+01

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	4.64E+04	5.65E-01	2.79E-01
D-E	2.08E+04	2.53E-01	1.25E-01
E-F	9.50E+03	1.16E-01	5.70E-02
SSOD	2.97E+05	3.61E+00	1.78E+00
TOTAL	3.73E+05	4.55E+00	2.24E+00

CPC SCREENING | U-TOTAL W/SAMPLES RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.42E-02	NO	1.42E+01	NO	Sub580	1.91E-03	YES	1.91E+00	YES
WPA	1.18E+00	NO	7.77E+01	NO	PDAR	9.14E-01	NO	3.73E+02	NO
Sub570	2.35E-02	NO	2.35E+01	NO	Sub581	4.39E-02	NO	4.39E+01	NO
Sub575	3.13E-03	YES	3.13E+00	YES	Sub582	1.60E-03	YES	1.60E+00	YES

DRAFT

PADDYS RUN BASIN | CHEMICAL: U-TOTAL W/SAMPLES | SCENARIO: WITH STORMWATER CONTROLS CURRENT

SURFACE WATER MODEL INPUTS: | Investigator: DCW | Date: 5/26/94 14:34

Subbasin	Ce Dissolved Conc. (mg/l)	PQi Dissolved Mass(g)	Vr Total Volume of Runoff (cf)	DF Dilution Factor	Paddys Run Conc. due to subbasin (mg/l)
Sub560	1.42E-02	6.86E+01	1.70E+05	2.00E-01	2.85E-03
Sub570	2.35E-02	1.32E+02	1.99E+05	9.68E-01	2.27E-02
Sub575	3.13E-03	1.09E+01	1.23E+05	2.62E-01	8.21E-04
Sub580	1.91E-03	2.35E+00	4.34E+04	1.28E-01	2.45E-04
Sub581	4.39E-02	5.58E+02	4.49E+05	9.06E-01	3.98E-02
Sub582	1.60E-03	1.66E+01	3.68E+05	4.35E-01	6.95E-04

Station	Discharge (cfs)	Station	Discharge (cfs)
QROUT0	1.0	qp(Rout25)	390.0
qp70CT	30.0	QSTA130(Rout25)	428.0
QSTA70(570-WPA)	31.0		
QROUT1	16.0	qp(Rout27)	349.0
qp575	16.0	QSTA100(Rout27)	358.0
QSTA75(575)	61.0		
QROUT2	57.0	qp(Rout3)	357.0
qpSTA80	78.0	QSTA120(Rout3)	384.0
QSTAEE(SSOD1)	134.0		
qpPADDY	386.0	Total Volume of Runoff Paddys Run Drainage Basin (cf)	1.03E+07
QGMA(AVG)	3460.0		

Combined Subbasin Loadings	Volume Weighted Dis. Conc. (mg/l)	Total Dissolved Mass (g)	Volume Weighted ads. Conc. (mg/kg)
Sub 560	1.42E-02	6.86E+01	4.43E+01
Sub570	2.35E-02	1.32E+02	1.62E+02
sub575	3.13E-03	1.09E+01	1.95E+01
Sub 580, 581 & 582	2.37E-02	5.77E+02	4.45E+01

SURFACE WATER MODEL RESULTS:

Surface Water Concentrations

Paddys Run

Cross section	Max. total dis. conc. in Paddys run(ug/l)	Max. total ads. conc. in Paddys run(mg/kg)
C-C	2.28E+01	1.57E+02
D-D	2.28E+01	1.57E+02
E-E	2.35E+01	1.57E+02
Max:	2.35E+01	1.57E+02

Great Miami River — ug/l

Avg. Conc. in Paddys Run at GMR	2.70E+00
Avg. Conc. in GMR	2.71E-01
Max. Conc. in Paddys Run at GMR	1.94E+01
Max. Conc. in GMR at Paddys Run	1.95E+00
Max. Conc. in GMR at Eff. Line (max week)	1.45E+00
Annual Conc. at Eff. Line	3.87E-01
Max. Sed. Conc. in P.R. at GMR (mg/kg)	1.30E+02
Max. Sed. Conc. in GMR at P.R. (mg/kg)	1.30E+01

Loading to the Great Miami Aquifer

Total Mass Loading Per Storm Event (2 days)

Cross Section	% of Inf. vol. from Sub560	% of Inf. vol. from & Sub570	% of Inf. vol. from Sub575	% of Inf. vol from Sub80	Mass loading (g)	Max. daily mass loading (lb/day)	Cgma per cell (ug/l)
C-D	20.6	25.2			4.75E+01	5.20E-02	3.87E+00
D-E	7.5	11.1	13.9		2.13E+01	2.34E-02	2.07E+00
E-F	0.7	1.6	1.1	1.5	1.14E+01	1.25E-02	1.29E+00
SSOD				56.6	3.27E+02	3.58E-01	1.94E+01
TOTAL					4.07E+02		

Total Mass Loading Per Year

Cross Section	Total Mass Loading (g)	Total Mass Distributed in 6 Months (lb/day)	Total Mass Distributed in 1 Year (lb/day)
C-D	3.51E+03	4.27E-02	2.11E-02
D-E	1.55E+03	1.88E-02	9.28E-03
E-F	4.32E+02	5.25E-03	2.59E-03
SSOD	9.27E+03	1.13E-01	5.56E-02
TOTAL	1.48E+04	1.80E-01	8.86E-02

CPC SCREENING | U-TOTAL W/SAMPLES RISK CRITERIA : 1.10E+01 (ug/l)

Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out	Subbasin	Dissolved Conc. (mg/l)	Screened Out	Conc. in in GMA (ug/l)	Screened Out
Sub560	1.42E-02	NO	3.84E+00	YES	Sub580	1.91E-03	YES	1.91E+00	YES
Sub570	2.35E-02	NO	3.84E+00	YES	Sub581	4.39E-02	NO	1.94E+01	NO
Sub575	3.13E-03	YES	3.13E+00	YES	Sub582	1.60E-03	YES	1.60E+00	YES

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CHEMICAL: U-TOTAL W/SAMPLES CURRENT

	SUBBASIN 560	SUBBASIN WPA	SUBBASIN 570	SUBBASIN 575
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	9.36E+00	4.21E+00	4.44E+00	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02	9.11E+00	1.07E+01	1.11E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	4.43E+01	4.64E+02	1.62E+02	1.95E+01
Single storm adsorbed contaminant quantity PXi (g):	4.15E+02	1.95E+03	7.19E+02	4.32E+01
Annual adsorbed contaminant quantity (g):	1.79E+04	1.48E+04	6.46E+03	7.22E+02
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	1.70E+05	1.20E+05	1.99E+05	1.23E+05
Annual runoff volume (cf):	2.78E+06	2.00E+06	3.34E+06	2.06E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.42E-02	1.18E+00	2.35E-02	3.13E-03
Single storm dissolved contaminant quantity PQi (g):	6.86E+01	4.02E+03	1.32E+02	1.09E+01
Annual dis. conta. qt (based on sediment yield)(g):	2.97E+03	3.05E+04	1.19E+03	1.82E+02
Annual dis. conta. qt (based on runoff) (g):	1.12E+03	6.70E+04	2.22E+03	1.82E+02

	SUBBASIN 580	SUBBASIN PDAR	SUBBASIN 581	SUBBASIN 582
SEDIMENT IN THE RUNOFF:				
Single storm event sediment yield Y(S)e (tonne):	5.10E+00	7.92E+00	8.69E+01	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01	1.17E+01	3.33E+02	5.19E+01
ADSORBED:				
Single storm adsorbed contaminant conc. Cs(mg/kg):	1.34E+01	5.58E+02	7.61E+01	9.47E+00
Single storm adsorbed contaminant quantity PXi (g):	6.85E+01	4.42E+03	6.62E+03	9.06E+01
Annual adsorbed contaminant quantity (g):	1.07E+03	1.46E+04	1.10E+05	2.34E+03
SURFACE WATER RUNOFF:				
Single storm runoff volume (cf):	4.34E+04	7.06E+05	4.49E+05	3.68E+05
Annual runoff volume (cf):	7.13E+05	1.17E+07	7.47E+06	6.31E+06
DISSOLVED :				
Single storm dissolved contaminant conc.Ce (mg/l):	1.91E-03	9.14E-01	4.39E-02	1.60E-03
Single storm dissolved contaminant quantity PQi (g):	2.35E+00	1.83E+04	5.58E+02	1.66E+01
Annual dis. conta. qt (based on sediment yield)(g):	3.66E+01	6.02E+04	9.29E+03	4.30E+02
Annual dis. conta. qt (based on runoff) (g):	3.86E+01	3.03E+05	9.28E+03	2.85E+02

investigator DCW

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CPC= U-TOTAL W/SAMPLES
Risk Criteria (ug/l) 11

AREA	Kd (l/Kg)	Concentration (mg/kg)	comment CURRENT
560A	2.22E+02	1.35E+01	
560B	2.22E+02	1.52E+02	
560C	1.50E+01	2.58E+02	
SWL	7.50E+01	2.30E+02	
560D	2.22E+02	1.74E+02	
570A	2.22E+02	8.84E+01	
570B	2.22E+02	1.10E+02	
570C	2.22E+02	3.50E+01	
570D	2.22E+02	5.89E+02	
570E	2.22E+02	4.75E+01	
575A	2.22E+02	1.43E+01	
575B	2.22E+02	5.88E+01	
SF	1.77E+02	2.74E+01	
580A	2.22E+02	1.35E+01	
581A	2.22E+02	1.83E+01	
581B	2.22E+02	2.17E+02	
581C	2.22E+02	4.00E+01	
581D	1.50E+01	1.26E+03	
582A	2.22E+02	8.59E+00	
582B	2.22E+02	9.39E+01	
AFP	3.75E+01	1.07E+01	
PAA	1.50E+01	1.23E+03	
PAB	1.50E+01	7.23E+02	
PAC	1.50E+01	2.92E+02	
PAD	1.50E+01	1.92E+02	
PAE	1.50E+01	1.58E+03	
PAF	2.22E+02	1.68E+02	
PAG	2.22E+02	3.95E+03	
PAH	2.22E+02	5.18E+01	
PAI	2.22E+02	2.41E+01	
LSP	2.65E+03	1.98E+02	
WPAA	2.22E+02	1.61E+02	
WPA.OU1	1.20E+01	728	
WPA.OU4	1.20E+01	357	

SUBBASIN 560 **CHEMICAL:** **U-TOTAL W/SAMPLES CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	3.17E-01
SCS curve number:	62.6

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.70E+05
Total storm runoff Qr (in):	0.23
Peak flow rate qp (cfs):	1.20E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.43
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.900

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.25

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	3.77

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.45
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
560a	2.22E+02	1.35E+01	2.51E-01
560b	2.22E+02	1.52E+02	5.60E-02
560c	1.50E+01	2.58E+02	4.00E-03
560d	2.22E+02	1.74E+02	4.00E-03
SWL	7.50E+01	2.30E+02	2.00E-03

Area	Ss (g)	Ds (g)
560a	1.268E+05	8.665E+01
560b	3.186E+05	2.178E+02
560c	3.837E+04	3.881E+02
560d	2.619E+04	1.790E+01
SWL	1.724E+04	3.488E+01
Total	5.272E+05	7.453E+02

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

Concentration from areas 560b, 560c, and SWL (ug/l)	60.45
Sediment Conc. areas 560b, 560c, and SWL (mg/kg)	162

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (560) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.36E+00
Annual sediment yield Y(S)a (tonne/yr):	1.01E+02

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.70E+05
Annual runoff volume (cf):	2.78E+06

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.43E+01
Single storm adsorbed contaminant quantity PXi (g):	4.15E+02
Annual adsorbed contaminant quantity (g):	1.79E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.42E-02
Single storm dissolved contaminant quantity PQi (g):	6.86E+01
Annual dis. conta. qt (based on sediment yield)(g):	2.97E+03
Annual dis. conta. qt (based on runoff) (g):	1.12E+03

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SUBBASIN WPA **CHEMICAL:** **U-TOTAL W/SAMPLES CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	7.20E-02
SCS curve number:	76.85

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.20E+05
Total storm runoff Qr (in):	0.73
Peak flow rate qp (cfs):	2.70E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.280

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.29

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	11.97

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.48
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
WPAa	2.22E+02	1.61E+02	2.90E-02
WPAou1	1.20E+01	7.28E+02	3.70E-02
WPAou4	1.20E+01	3.57E+02	6.00E-03

Area	Ss (g)	Ds (g)
WPAa	1.785E+05	1.195E+02
WPAou1	1.020E+06	1.263E+04
WPAou4	8.110E+04	1.005E+03
Total	1.279E+06	1.376E+04

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (WPA) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	4.21E+00
Annual sediment yield Y(S)a (tonne/yr):	9.11E+00

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.20E+05
Annual runoff volume (cf):	2.00E+06

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	4.64E+02
Single storm adsorbed contaminant quantity PXi (g):	1.95E+03
Annual adsorbed contaminant quantity (g):	1.48E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.18E+00
Single storm dissolved contaminant quantity PQi (g):	4.02E+03
Annual dis. conta. qt (based on sediment yield)(g):	3.05E+04
Annual dis. conta. qt (based on runoff) (g):	6.70E+04

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SUBBASIN 570 **CHEMICAL:** **U-TOTAL W/SAMPLES CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	1.20E-01
SCS curve number:	76.7

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.99E+05
Total storm runoff Qr (in):	0.73
Peak flow rate qp (cfs):	3.00E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.53
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.190

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.27

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	11.97

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.20
Soil bulk density(g/cm^3):	1.33
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
570a	2.22E+02	8.84E+01	5.80E-02
570b	2.22E+02	1.10E+02	1.80E-02
570c	2.22E+02	3.50E+01	4.00E-03
570d	2.22E+02	5.89E+02	1.90E-02
570e	2.22E+02	4.75E+01	2.10E-02

Area	Ss (g)	Ds (g)
570a	1.765E+05	1.196E+02
570b	6.828E+04	4.625E+01
570c	4.819E+03	3.264E+00
570d	3.850E+05	2.608E+02
570e	3.434E+04	2.326E+01
Total	6.690E+05	4.532E+02

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (570) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	4.44E+00
Annual sediment yield Y(S)a (tonne/yr):	1.07E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.99E+05
Annual runoff volume (cf):	3.34E+06

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.62E+02
Single storm adsorbed contaminant quantity PXi (g):	7.19E+02
Annual adsorbed contaminant quantity (g):	6.46E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	2.35E-02
Single storm dissolved contaminant quantity PQi (g):	1.32E+02
Annual dis. conta. qt (based on sediment yield)(g):	1.19E+03
Annual dis. conta. qt (based on runoff) (g):	2.22E+03

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SUBBASIN 575 **CHEMICAL:** **U-TOTAL W/SAMPLES CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	1.20E-01
SCS curve number:	69.82

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	1.23E+05
Total storm runoff Qr (in):	0.45
Peak flow rate qp (cfs):	1.60E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.52
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.180

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.30

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	7.38

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.21
Soil bulk density(g/cm^3):	1.36
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
575a	2.22E+02	1.43E+01	9.20E-02
575b	2.22E+02	5.88E+01	8.00E-03
SF	1.77E+02	2.74E+01	2.00E-02

Area	Ss (g)	Ds (g)
575a	4.644E+04	3.230E+01
575b	1.656E+04	1.152E+01
SF	1.929E+04	1.682E+01
Total	8.228E+04	6.064E+01

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (575) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	2.22E+00
Annual sediment yield Y(S)a (tonne/yr):	1.11E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	1.23E+05
Annual runoff volume (cf):	2.06E+06

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.95E+01
Single storm adsorbed contaminant quantity PXi (g):	4.32E+01
Annual adsorbed contaminant quantity (g):	7.22E+02

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	3.13E-03
Single storm dissolved contaminant quantity PQi (g):	1.09E+01
Annual dis. conta. qt (based on sediment yield)(g):	1.82E+02
Annual dis. conta. qt (based on runoff) (g):	1.82E+02

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SUBBASIN 580 **CHEMICAL:** **U-TOTAL W/SAMPLES CURRENT** Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	3.60E-02
SCS curve number:	71.95

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	4.34E+04
Total storm runoff Qr (in):	0.52
Peak flow rate qp (cfs):	6.00E+00
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonne/ha/Rr):	0.56
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	1.200

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.29

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	8.53

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.20
Soil bulk density(g/cm^3):	1.36
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
580a	2.22E+02	1.35E+01	3.60E-02

Area	Ss (g)	Ds (g)
580a	1.704E+04	1.129E+01
Total	1.704E+04	1.129E+01

Notes:
Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (580) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	5.10E+00
Annual sediment yield Y(S)a (tonne/yr):	2.26E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	4.34E+04
Annual runoff volume (cf):	7.13E+05

U-TOTAL W/SAMPLES in the Runoff:

ABSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	1.34E+01
Single storm adsorbed contaminant quantity PXi (g):	6.85E+01
Annual adsorbed contaminant quantity (g):	1.07E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.91E-03
Single storm dissolved contaminant quantity PQi (g):	2.35E+00
Annual dis. conta. qt (based on sediment yield)(g):	3.66E+01
Annual dis. conta. qt (based on runoff) (g):	3.86E+01

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SUBBASIN PDAR **CHEMICAL:** U-TOTAL W/SAMPLES CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	2.44E-01
SCS curve number:	86.2

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	7.06E+05
Total storm runoff Qr (in):	1.26
Peak flow rate qp (cfs):	1.80E+02
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	0.50
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.135

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr):	303.60
Sediment delivery ratio Sd:	0.45

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	20.66

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.40
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
PAa	1.50E+01	1.23E+03	1.90E-02
PAb	1.50E+01	7.23E+02	4.10E-02
PAc	1.50E+01	2.92E+02	1.40E-02
PAd	1.50E+01	1.92E+02	8.00E-03
PAe	1.50E+01	1.58E+03	2.20E-02
PAf	2.22E+02	1.68E+02	1.60E-02
PAg	2.22E+02	3.95E+03	9.00E-03
PAh	2.22E+02	5.18E+01	7.90E-02
PAi	2.22E+02	2.41E+01	3.30E-02
LSP	2.65E+03	1.98E+02	3.00E-03

Area	Ss (g)	Ds (g)
PAa	8.395E+05	8.794E+03
PAb	1.064E+06	1.114E+04
PAc	1.467E+05	1.536E+03
PAd	5.499E+04	5.761E+02
PAe	1.250E+06	1.309E+04
PAf	9.748E+04	6.900E+01
PAg	1.289E+06	9.125E+02
PAh	1.482E+05	1.049E+02
PAi	2.885E+04	2.042E+01
LSP	2.154E+04	1.277E+00
Total	4.940E+06	3.625E+04

Concentration excluding area PAI (ug/l)

1.06E+03

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (PDAR) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	7.92E+00
Annual sediment yield Y(S)a (tonne/yr):	1.17E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	7.06E+05
Annual runoff volume (cf):	1.17E+07

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	5.58E+02
Single storm adsorbed contaminant quantity PXi (g):	4.42E+03
Annual adsorbed contaminant quantity (g):	1.46E+04

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	9.14E-01
Single storm dissolved contaminant quantity PQI (g):	1.83E+04
Annual dis. conta. qt (based on sediment yield)(g):	6.02E+04
Annual dis. conta. qt (based on runoff) (g):	3.03E+05

SUBBASIN 581 **CHEMICAL:** U-TOTAL W/SAMPLES CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:34

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.56E-01
SCS curve number:	69.43

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	4.49E+05
Total storm runoff Qr (in):	0.43
Peak flow rate qp (cfs):	4.80E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	2.000

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr)	303.60
Sediment delivery ratio Sd:	0.23

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	7.05

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.23
Soil bulk density(g/cm^3):	1.48
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
581a	2.22E+02	1.83E+01	3.23E-01
581b	2.22E+02	2.17E+02	9.90E-02
581c	2.22E+02	4.00E+01	2.90E-02
581d	1.50E+01	1.26E+03	5.00E-03

Area	Ss (g)	Ds (g)
581a	2.258E+05	1.581E+02
581b	8.212E+05	5.749E+02
581c	4.442E+04	3.110E+01
581d	2.396E+05	2.482E+03
Total	1.331E+06	3.246E+03

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

Concentration from areas 581b, 581c, and 581d (ug/l)	143.22
Sediment Conc. areas 560b, 560c, and SWL (mg/kg)	217

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (581) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	8.69E+01
Annual sediment yield Y(S)a (tonne/yr):	3.33E+02

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	4.49E+05
Annual runoff volume (cf):	7.47E+06

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	7.61E+01
Single storm adsorbed contaminant quantity PXi (g):	6.62E+03
Annual adsorbed contaminant quantity (g):	1.10E+05

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	4.39E-02
Single storm dissolved contaminant quantity PQi (g):	5.58E+02
Annual dis. conta. qt (based on sediment yield)(g):	9.29E+03
Annual dis. conta. qt (based on runoff) (g):	9.28E+03

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SUBBASIN 582 **CHEMICAL:** **U-TOTAL W/SAMPLES** CURRENT Investigator: DCW

STEP 1 SURFACE WATER MODEL INPUTS: Date: 5/26/94 14:3

Subbasin Specific Inputs:

Total subbasin area (mile^2):	4.87E-01
SCS curve number:	66.53

HEC-1: (Storm-Event Runoff)

Volume of storm runoff Vr (cf):	3.68E+05
Total storm runoff Qr (in):	0.34
Peak flow rate qp (cfs):	3.00E+01
Total storm rainfall (in):	2.5

MUSLE: (Storm-Event Sediment Loading)

Conversion constant :	11.80
Erosion control practice factor P:	1.00
Soil erodibility factor K (tonnes/ha/Rr):	0.48
Cover factor C:	0.04
Product of slope length factor and slope steepness factor LS:	0.320

USLE: (Annual Sediment Loading)

Rainfall/runoff factor Rr (10^2 m-tonne-cm/ha-hr):	303.60
Sediment delivery ratio Sd:	0.21

HEC-1 Runoff/Rainfall Ratio (Annual Runoff)

Annual rainfall (in):	41.00
Annual runoff (in):	5.58

Contaminant Specific Inputs:

PARTITION EQUATIONS: (Contaminant Concentrations)

Available water capacity:	0.22
Soil bulk density(g/cm^3):	1.41
Conversion constant ((kg/mg)(cm^2/ha)):	100.00

Area	Kd(l/kg)	Conc.(mg/kg)	Area (mile^2)
582a	2.22E+02	8.59E+00	4.79E-01
582b	2.22E+02	9.39E+01	5.00E-03
AFP	3.75E+01	1.07E+01	3.00E-03

Area	Ss (g)	Ds (g)
582a	1.501E+05	1.055E+02
582b	1.713E+04	1.204E+01
AFP	1.167E+03	4.857E+00
Total	1.684E+05	1.224E+02

Notes: Ss = Adsorbed substance quantity
Ds = Dissolved substance quantity

Concentration from areas 582b, and AFP (ug/l)

13.42

STEP 1 SURFACE WATER MODEL RESULTS:

Subbasin (582) Specific Results:

SEDIMENT IN THE RUNOFF:

Single storm event sediment yield Y(S)e (tonne):	9.56E+00
Annual sediment yield Y(S)a (tonne/yr):	5.19E+01

SURFACE WATER RUNOFF:

Single storm runoff volume (cf):	3.68E+05
Annual runoff volume (cf):	6.31E+06

U-TOTAL W/SAMPLES in the Runoff:

ADSORBED:

Single storm adsorbed contaminant conc. Cs(mg/kg):	9.47E+00
Single storm adsorbed contaminant quantity PXi (g):	9.06E+01
Annual adsorbed contaminant quantity (g):	2.34E+03

DISSOLVED :

Single storm dissolved contaminant conc.Ce (mg/l):	1.60E-03
Single storm dissolved contaminant quantity PQi (g):	1.66E+01
Annual dis. conta. qt (based on sediment yield)(g):	4.30E+0
Annual dis. conta. qt (based on runoff) (g):	2.85E+02

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F.2.VI Attachment

Attachment F.2.VI

Selection of Predominant Carcinogenic and Noncarcinogenic Constituents of Concern COCs Based on Relative Contributions to Total Risk Level and Hazard Index Over OU1, OU2, and OU4 Surface Water Pathway

TABLE F.2-VI-1
SELECTION OF PREDOMINANT CARCINOGENIC AND NONCARCINOGENIC CONSTITUENTS OF CONCERN (COCs)
FOR FATE AND TRANSPORT MODELING [1]
BASED ON RELATIVE CONTRIBUTIONS TO TOTAL RISK LEVEL AND HAZARD INDEX OVER OU1, OU2 AND OU4 - COMBINED
SURFACE WATER PATHWAYS

	ICLRs for OU1, OU2 and OU4					HQs for OU1, OU2 and OU4				
	Sum of ICLRs Across Pathways [3]			Sum of ICLRs Across Operable Units	% Contribution to Total ICLR for All Operable Units	Sum of HQs Across Pathways [3]			Sum of HQs Across Operable Units	% Contribution to HI for All Operable Units
Constituent of Concern [2]	OU1	OU2	OU4			OU1	OU2	OU4		
Radionuclides										
Actinium-227+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137+1D	7.9E-05	NA	NA	7.9E-05	29.26	NA	NA	NA	NA	NA
Lead-210+2D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-238	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Protactinium-231	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+6D	4.6E-07	NA	NA	4.6E-07	0.17	NA	NA	NA	NA	NA
Radium-228+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radon-222+4D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90+1D	1.5E-05	NA	NA	1.5E-05	5.56	NA	NA	NA	NA	NA
Technetium-99	7.4E-05	NA	NA	7.4E-05	27.41	NA	NA	NA	NA	NA
Thorium-228+7D	NA	1.7E-06	NA	1.7E-06	0.63	NA	NA	NA	NA	NA
Thorium-230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	1.7E-05	NA	NA	1.7E-05	6.30	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+2D	7.1E-05	NA	NA	7.1E-05	26.30	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	1.6E-07	1.6E-07	0.06	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics										
Arsenic	6.20E-06	NA	NA	6.2E-06	2.30	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	2.0E-01	NA	NA	2.0E-01	26.99
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	NA	NA	3.6E-01	3.6E-01	52.17

	OU1	OU2	OU4
Total ICLR for each OU [4]:	2.68E-04	1.6E-06	2.3E-07

Total ICLR over all OUs [5]: 2.7E-04

	OU1	OU2	OU4
Total HI for each OU [4]:	3.3E-01	0.0E+00	3.6E-01

Total HI over all OUs [5]: 6.9E-01

Notes:
[1] Predominant COCs selected for fate and transport modeling are shaded.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway in at least one operable unit.
[3] Surface water exposure pathways evaluated include ingestion of surface water, dermal contact with surface water, ingestion of meat and ingestion of milk.
[4] Total risk levels/hazard indices presented for each OU were obtained from respective baseline human health risk assessments and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
[5] Represents the sum of all risk levels/hazard indices over all COCs, exposure pathways and operable units.
NA - Not applicable.

TABLE F.2-VI-2
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
SURFACE WATER - FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER
OU1 FEMP

Constituent of Concern [2]	OU1 ICLRs				OU1 HQs			
	Ingestion of Meat	Ingestion of Milk	Sum of Risks Across Pathways	% Contribution to Total Risk	Ingestion of Meat	Ingestion of Milk Products	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides								
Cesium-137+1D	3.3E-05	4.60E-05	7.9E-05	29.48	NA	NA	NA	NA
Radium-226+8D	NA	4.60E-07	4.6E-07	0.17	NA	NA	NA	NA
Strontium-90	6.7E-07	1.40E-05	1.5E-05	5.47	NA	NA	NA	NA
Technetium-99	1.3E-05	6.10E-05	7.4E-05	27.61	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	1.3E-06	1.60E-05	1.7E-05	6.46	NA	NA	NA	NA
Uranium-238+2D	5.4E-06	6.60E-05	7.1E-05	26.64	NA	NA	NA	NA
Semivolatile Organic Compounds								
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics								
Arsenic	5.5E-06	6.6E-07	6.2E-06	2.30	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	2.0E-01	2.0E-01	60.06
Uranium, Total	NA	NA	NA	NA	NA	NA	NA	NA

Total ICLR for Pathway [3]:	5.6E-05	2.1E-04	**Total HI for Pathway [3]:**	9.3E-02	2.4E-01
Total ICLR for OU1:		2.68E-04	**Total HI for OU1:**		3.33E-01

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those than a risk level of 1E-07 for carcinogens, and those less tha a hazard quotient of 1E-01 for toxicants).
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.

TABLE F.2-VI-3
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
SURFACE WATER PATHWAY - FUTURE EXPANDED TRESPASSER, OU2- WIDE
OU2 FEMP

Constituent of Concern [2]	OU2 ICLRs					OU2 HQs			
	Ingestion of Surface Water	Dermal Contact with Surface Water		Sum of Risks Across Pathways	%Contribution to Total Risk	Ingestion of Surface Water	Dermal Contact with Surface Water	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides									
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-228+7D	1.7E-06	NA	NA	1.7E-06	94.44	NA	NA	NA	NA
Uranium-234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+2D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds									
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	NA	NA	NA	NA

Total ICLR for Pathway [3]:	1.6E-06	0.0E+00	**Total HI for Pathway [3]:**	0.0E+00	0.0E+00
Total ICLR for OU2:		1.60E-06	**Total HI for OU2:**		0.0E+00

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard index(ices) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less tha a hazard quotient of 1E-01 for toxicants).
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.

TABLE F.2-VI-4
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
SURFACE WATER PATHWAYS-CURRENT LAND USE
TRESPASSING CHILD WITHOUT ACCESS CONTROLS SILOS INTACT
OU4 FEMP

Constituent of Concern [2]	OU4 ICLRs				OU4 HQs			
	Ingestion of Surface Water	Dermal Exposure while Swimming	Sum of Risks Across Pathways	% Contribution to Total Risk	Ingestion of Surface Water	Dermal Exposure while Swimming	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides								
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+2D	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds								
Benzo(a)pyrene	3.39E-11	1.57E-07	1.57E-07	69.16	NA	NA	NA	NA
Inorganics								
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	5.84E-04	3.54E-01	3.55E-01	100.00

Total ICLR for Pathway [3]:	1.2E-08	2.15E-07	Total HI for Pathway [3]:	6.18E-04	3.54E-01
Total ICLR for OU4:		2.27E-07	Total HI for OU4:		3.55E-01

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.

F.3 Groundwater Modeling

F.3.0 GROUNDWATER FATE AND TRANSPORT MODELING

F.3.1 INTRODUCTION

Groundwater fate and transport models, which are required to support the baseline risk assessment, were developed and applied to predict contaminant movement from the Operable Unit 5 contaminant source areas to potential human or ecological receptors via a number of potential migration pathways through the environmental media over a 1000-year time frame. The results of the fate and transport modeling in groundwater pathways were used together with measured current contaminant conditions in the Operable Unit 5 baseline risk assessment (Section 6.0 and Appendix A) to estimate potential risks to human health and the environment.

Section 5.0 of this report presents the fate and transport modeling approach and key results for all of the migration pathways. This appendix provides additional detail on the modeling performed for the groundwater pathways. This appendix includes:

- Descriptions of the general hydrogeologic conditions and the conceptual models
- The technical approach, the modeling framework, and descriptions of the specific groundwater fate and transport models
- Definition of contaminant loading from soil, perched groundwater and surface water including geochemical parameters used to help estimate source loadings
- The modeling process used to simulate the vadose zone to Great Miami Aquifer pathway
- The modeling process used to simulate the perched groundwater to surface water pathway
- The modeling results
- An evaluation of the model's performance.

F.3.1.1 Modeling Domain

The environmental media described in Section 3, and contaminants within, to be evaluated in the Operable Unit 5 RI groundwater fate and transport modeling include:

- The Great Miami Aquifer underlying and downgradient of the FEMP
- Surface water and sediment in the vicinity of the FEMP
- Surface and subsurface soils outside of Operable Units 1, 2, and 4 areas

- Uncapped surface soil in the Operable Units 1, 2, and 4 areas
- Perched groundwater outside of Operable Units 1, 2, and 4 areas

Figure F.3.1-1 shows the Operable Unit 5 groundwater fate and transport modeling domain. This area covers these environmental media and an overall area large enough to cover all major potential contaminant receptor locations identified in the baseline risk assessment. Superimposed on this domain is the model grid used to simulate contaminant transport. This grid consists of 120 by 112 cells with each cell 125 by 125 feet. Figure F.3.1-2 shows the overall surface source area considered in the groundwater modeling. Figure F.3.1-3 depicts the Operable Unit 5 risk assessment zones for the FEMP and the potential receptors in the groundwater pathway.

F.3.2 HYDROGEOLOGIC CONDITIONS AND CONCEPTUAL MODEL FOR THE GROUNDWATER PATHWAYS

Natural systems are much too heterogeneous to represent completely with mathematical models. Therefore, fate and transport modeling requires an implication of the system being modeled in the form of a conceptual model. The conceptual model is based upon an understanding of the real system so that the appropriate elements can be represented and the mathematical models can effectively represent the real system.

The following sections summarize the hydrogeology and define the conceptual model and contaminant pathways.

F.3.2.1 General Groundwater Hydrogeological Conditions

General conditions of the hydrogeological environment to be simulated in the groundwater pathway of Operable Unit 5 contaminant fate and transport modeling are described in Section 3.6. The modeling domain (Figure F.3.1-1) was selected based on hydrogeological conditions as well as the sources of groundwater contamination, the potential receptor locations, and the needs of future groundwater remedial design.

Two major hydrogeological units in the groundwater modeling domain include the glacial overburden and the Great Miami Aquifer. The "vadose zone" beneath the FEMP extends from the ground surface to the water table of the Great Miami Aquifer, which consists of up to 20 to 50 feet of glacial overburden material overlying approximately 3 to 45 feet of unsaturated sand and gravel outwash. The hydraulic conductivity of the glacial overburden is much lower than the hydraulic conductivity of

the Great Miami Aquifer. The highest hydraulic conductivity calculated for the glacial overburden is 3 orders of magnitude lower than the hydraulic conductivity calculated for the sand and gravel of the Great Miami Aquifer. In general, flow rate is relatively slow and to the west in the glacial overburden and high and to the east and south in the Great Miami Aquifer.

Description of the Glacial Overburden

Glacial overburden sediment lies between the FEMP facility and the underlying Great Miami Aquifer. The glacial overburden is very heterogeneous and contains clay, silt, sand, and gravel and is saturated beginning at approximately 3 to 5 feet below ground surface (Section 3.6.1). Gray clay located at the base of the overburden deposits serves to limit the downward movement of fluids and create a perched groundwater system within the overburden sediment. Perched water table maps made using an average of several years of elevation data indicate that the general potential for fluid movement within the glacial overburden is to the west towards Paddys Run or the storm sewer outfall ditch (SSOD).

The low hydraulic conductivity of the clay contained within the glacial overburden makes direct vertical migration a very lengthy process (i.e., over 40 years). The possibility exists though, that fluids could "short circuit" the protective nature of the clay and find a route through or out of the glacial overburden that would require less travel time. Examples of "short circuit" routes include interconnected coarse-grained sediment or fractures. The density of fractures in the overburden is believed to dissipate with depth. Most fractures appear to be near-surface features and do not appear to be a major problem at depth.

The possibility of a coarse-grained interconnection through the clay is greatest beneath the western portion of the FEMP. A basin deposit is present where much of the coarser grained material within the overburden is located. Evidently there are channels leading into this basin from the north, the north being the most likely source of sediment for this area. Drilling just east of the waste pit area has revealed that channels as small as 20 feet wide exist. The possibility that similar small channels exist elsewhere cannot be overlooked.

Description of the Great Miami Aquifer

The Great Miami Aquifer is a textbook example of a glaciofluvial buried valley aquifer (Section 3.6.2). It is a sand and gravel water table system consisting of approximately 150 feet of

glacio-fluvial outwash deposits. The outwash deposits are divided by a 15-foot clay interbed which serves as an aquitard and are capped by approximately 20 to 50 feet of glacial overburden sediment which consists predominately of glacial till and contains perched groundwater. No evidence of fracturing has been reported in the sand and gravel of the Great Miami Aquifer. Groundwater in the aquifer enters the FEMP area via buried channels on the west, north, and east and exits to the south and southeast. The Great Miami Aquifer has been designated as a sole-source aquifer pursuant to federal Safe Drinking Water Act regulations.

302 In order for fluids to get from the FEMP down into the Great Miami Aquifer they either have to travel across the overburden sediment to a location where they can infiltrate into the aquifer or move through the sediment. If fluids move through the overburden sediment they could either leak out through the bottom of the overburden or seep out onto the land surface. The pathway of least resistance is across the overburden sediment. Several surface features (i.e., portions of Paddys Run and the SSOD) have eroded through the glacial overburden exposing the underlying Great Miami Aquifer. Fluids that can reach these erosional areas have direct access to the Great Miami Aquifer. Surface water runoff traveling overland can reach the end of the glacial overburden and infiltrate to the Great Miami Aquifer before reaching either Paddys Run or the SSOD (e.g., in the Operable Unit 2 area). This overland infiltration is accounted for in the loading terms for the SSOD and Paddys Run. As indicated in Figure 5-27, approximately 96 percent of the contaminated runoff is assumed to directly infiltrate through the unsaturated sand and gravel. Any surface water runoff that infiltrates before reaching the streambed is still accounted for in the surface water loading terms used in the groundwater model. The size of the groundwater model grid (i.e., 125 feet by 125 feet) also makes the distance between the edge of glacial overburden in the Operable Unit 2 area and the SSOD streambed insignificant. Historically, surface water loading appears to be the pathway that allowed the most contamination to enter the Great Miami Aquifer. Once fluids enter the Great Miami Aquifer they are transported either to the east or south depending upon the point of entry.

F.3.2.2 Conceptual Model

Figure F.3.2-1 shows the conceptual model for contaminant transport for Operable Unit 5 at the FEMP. Contaminated soil is situated above a water-bearing glacial overburden which contains numerous perched water zones. Rainfall can either run off carrying suspended and dissolved contaminants or form leachate by infiltrating vertically through the contaminated soil and through the glacial overburden to the Great Miami Aquifer. The Great Miami Aquifer, which serves as a

principal source of domestic, municipal, and industrial water throughout the region, is considered the primary pathway by which contaminants released from Operable Unit 5 could be transported to a human receptor.

The extent to which contaminants may migrate through the vadose zone to the Great Miami Aquifer depends both on physical site characteristics and the physical and chemical properties of the contaminants (Section 3.6.3). The migration of water and dissolved contaminants from the contaminant source to the receptor involves flow through both unsaturated (vadose zone) and saturated zones (regional aquifer and perched water zones). Flow and contaminant transport in these zones is affected by the permeability of the media, the driving gradient, and the saturation conditions. Other factors that affect solute transport include dispersion, attenuation and retardation.

As shown in Figure F.3.2-1 groundwater contaminant transport from Operable Unit 5 sources may follow several routes:

- Leaching of contaminants from the contaminated soil through the vadose zone to the underlying Great Miami Aquifer
- Infiltration of contaminated perched water vertically through the vadose zone to the underlying Great Miami Aquifer
- Movement of contaminated perched water laterally along a continuous sand lens to a surface water body
- Infiltration of contaminated surface water from Paddys Run and the SSOD to the Great Miami Aquifer
- Natural and induced flow of groundwater in the Great Miami Aquifer which can carry dissolved contaminants and, potentially, contaminants adsorbed to colloidal particles.

For groundwater fate and transport modeling, three primary pathways are defined that reflect movement from contaminated surface soil to a surface water or Great Miami Aquifer receptor (see Figure F.3.2-1). First, migration from the contaminated soil vertically through the vadose zone to the aquifer is designated the vadose zone to Great Miami Aquifer pathway. Second, migration of contaminants from the surface soil in surface runoff to the SSOD/Paddys Run and from there to the Great Miami Aquifer is designated the surface water to Great Miami Aquifer pathway. Finally, migration from the contaminated soil to perched water and laterally to seeps along the surface water courses is designated the perched water to surface water pathway.

F.3.2.3 Conceptual Model for Infiltration Rate Calculation and Screening

Because of the heterogeneity of the vadose zone beneath the waste areas and the need for simplification for screening, five separate zones were developed for the overall domain covering the waste areas in Operable Unit 5. Superimposed on these conceptual model zones are 27 source areas. These source areas are discussed above in Section F.3.4.

304 Figure F.3.2-2 shows the areal definition of the five infiltration zones for Operable Unit 5 while Figure F.3.2-3 shows the generalized cross sections for these zones. These infiltration zones are used for defining the layer properties for calculating seepage velocities and for conducting travel time screening. These generalized cross sections are based upon inspection of several cross sections developed over the area and are delineated based upon the similarity of the vertical sequence of stratigraphic units over each zone. For contaminant screening and for modeling vadose zone transport, the top brown clay layer is ignored; i.e., transport is simulated to begin at the top of the layer below the brown clay. In general, the two principle layers for transport in the five zones are the gray clay (varying in thickness from 10 to 30 feet) and the unsaturated Great Miami Aquifer sand (varying in thickness from 20 to 35 feet). As shown in Figure F.3.2-3, Zone I contains a 15-foot-thick sand lens on top of the gray clay. Zone V represents a relatively small area where the gray clay has been degraded due to chemical releases in the vicinity of Plant 6. These releases have resulted in increased hydraulic conductivity of the gray clay by an estimated 3 orders of magnitude.

303 Hydraulic conductivity values for the different units are also tabulated in Figure F.3.2-3. These values were derived from recent glacial overburden characterization efforts (DOE 1994a), from the glacial overburden model development process (DOE 1994b), and from the Sandia Waste Isolation Flow and Transport (SWIFT) Great Miami Aquifer model calibration (DOE 1994e). Because vertical fractures exist in the oxidized layers (brown clay and brown clay/sand), K_v and K_h in these layers are assumed to be similar and are represented by the slug test results. Fractures in the brown/gray sand layer are less likely to occur due to the coarse nature of sand; K_v is commonly determined to be the slug test result (K_h) divided by 10. In addition to the gray clay layer the weathered glacial overburden (i.e., brown clay, brown clay/sand, and brown/gray sand) is included in the HELP modeling for determining the surface infiltration and recharge rates to the Great Miami Aquifer through the overburden. The weathered overburden functions like a reservoir in the HELP model and results in a higher infiltration rate. However, the weathered layers are not included when simulating contaminant transport through the overburden. Therefore, no slowdown of contaminant migration

000938

due to retardation or adsorption through weathered layers are considered in modeling. The objective was to ensure that the overall modeling approach is conservative in estimating infiltration rate and contaminant migration.

F.3.3 TECHNICAL APPROACH

F.3.3.1 Groundwater Fate and Transport Modeling Approach

Groundwater fate and transport models were developed and used to predict the transport of contaminants within various media and to estimate the concentrations of contaminants that potential receptors may be exposed to in the future. The groundwater fate and transport modeling processes involve many specific technical steps in order to satisfy all the requirements of the Operable Unit 5 baseline risk assessment. The approach taken was to ensure that all the required information for supporting the risk assessment could be generated with reasonable amounts of time and efforts. For example, as part of the initial modeling process, screening of constituents of potential concern (CPCs) was performed to narrow down the list of compounds to be carried through the later detailed modeling process.

To aid the discussion, the following acronyms are used to refer to constituents in different stages of the constituent screening, fate and transport modeling, and risk assessment:

- DC Detected constituent with at least one positive hit reported in the analytical database
- COPC Constituent of preliminary concern is a DC with a concentration higher than the background concentration and toxicity screening level concentration
- CPC Constituent of potential concern is a COPC that passes the travel time, decay, and vadose zone transport screening
- COC Constituent of concern is a CPC that has been predicted to pose unacceptable impacts to human and/or environmental receptors.

CPCs are the constituents that require complete, detailed contaminant fate and transport modeling. The modeling results for CPCs were then used in the risk assessment to identify the COCs.

The selection, development and application of analytical and numerical models to simulate contaminant transport through the groundwater pathway is ultimately based upon the conceptual model of the site (see Section F.3.2 and Figure F.3.2-1). In summary, Operable Unit 5 consists of contaminated shallow soil, deep soil, perched groundwater (outside of the other operable units) and contaminated Great Miami Aquifer groundwater. Operable Unit 5 contaminants (either dissolved as leachate or as suspended particles in liquid) move vertically through the vadose zone pathway as contaminated runoff through the surface water pathway or laterally from perched groundwater to the surface water. Perched groundwater also contributes additional mass loading for vertical transport. The Great Miami Aquifer receives contaminant loading from both the vadose zone model and the surface water model. Existing contamination is also present in the Great Miami Aquifer based upon both monitoring data from wells in the Great Miami Aquifer and model simulations from other operable units.

The approach to the groundwater fate and transport modeling can be summarized as the following steps:

- Definition of Waste Areas - Surface soil sampling data for uranium (less than 1.5 feet deep) was reviewed to determine waste areas consisting of similar contaminant levels. Solid block modeling was performed for the deep soil sampling data (greater than 1.5 feet deep) to define deep waste areas, again with similar contaminant characteristics.

- Definition of Major Constituents - Other operable unit baseline risk assessments were reviewed to define COCs that accounted for the majority of the risk from releases from these other operable units. By classifying constituents in this manner, more detailed modeling is performed on major CPCs and screening models are selectively used on other CPCs.

- Definition of the Conceptual Model - Conceptual transport models were defined for the groundwater pathways based on a reasonable and conservative depiction of the current and future environmental settings.

- Definition of Glacial Overburden Zones - Zones were created to simplify the heterogeneous surface and subsurface properties of the glacial overburden by separating the site into areas with reasonably similar properties. These zones were used for defining the layer properties for calculating seepage velocities and for conducting travel time screening.

- Definition of Chemical and Geochemical Properties of Constituents - Partition coefficients, retardation factors, decay coefficients, and 10^{-7} or hazard quotient (HQ) = 0.1 screening levels were established for each CPC from site and general literature.

- Performance of Screening to Reduce CPCs - Screening steps were undertaken to eliminate constituents that pose little or no risk to allow the analysis to focus on the constituents that cause the highest percentage of the risk.

- Definition of Surface Water Loading Terms - Runoff and surface water modeling was performed to define aquifer contaminant loading from the SSOD and Paddys Run (see Appendix F.2).

- Definition of Initial Great Miami Aquifer and Perched Groundwater Conditions - Initial conditions were defined for the Great Miami Aquifer model with 1994 established as simulation time zero. Initial conditions were delineated as the highest concentration for a particular block from 40-year model runs with loading from Operable Units 1, 2, and 4 and contoured monitoring data for Type 2, Type 3 and Type 4 monitoring wells. Contamination zones were established for perched groundwater based on monitoring data in the Type 1 wells.

- Calculating Transport through the Vadose Zone - Models were used to calculate vertical transport through the glacial overburden. Location-specific layer thicknesses were defined. Hydraulic properties were estimated for each layer based on lithology of material.

- Calculating Lateral Transport through the Perched Water System - Models were used to calculate contaminant transport laterally through the perched water system. Layer configuration and hydraulic properties were defined based upon stratigraphic correlations.

- Calculating Transport through the Saturated Great Miami Aquifer - Models were used to calculate contaminant transport through the Great Miami Aquifer. Hydraulic properties were estimated for the model based on the lithology of aquifer material and model calibration.

F.3.3.2 Modeling Framework

Figure F.3.3-1 summarizes the conceptual model of how analytical and numerical models were used to represent the contaminant transport processes. Models are used to define infiltration rate (Hydraulic Evaluation of Landfill Performance [HELP]), simulate runoff to surface water, simulate 1-dimensional vertical transport (One-Dimensional Analytical Solute Transport [ODAST]/ SWIFTLOAD), simulate perched water and Great Miami Aquifer 1-dimensional lateral transport (ECTran), and simulate 3-dimensional Great Miami Aquifer transport (SWIFT). In addition, a 3-dimensional flow and contaminant transport model of the glacial overburden (the Glacial Overburden/Upper Great Miami Aquifer System [GO/UGMAS] model) is used to confirm the pathways in the glacial overburden.

Figure F.3.3-2 shows, in a flowchart form, the data sets and models used to simulate contaminant transport through the different pathways. Figure F.3.3-2 also presents the overall modeling

framework and procedure employed in the Operable Unit 5 groundwater fate and transport modeling, showing the process of generating model predictions at exposure point concentrations from the initial RI/FS database. This figure shows the relationships between the data sets and the models, defines the location of different screening steps, and summarizes essential output from the different models.

Not all the CPCs need to be modeled using the main fate and transport model (i.e., ODAST/SWIFT model) due to differences in toxicity, chemical persistence, and extent of contamination. All the COPCs which failed the mobility and toxicity screening were modeled with ODAST/SWIFTLOAD to determine their mass loading rates through the overburden into the Great Miami Aquifer. Two models were then used to simulate contaminant migration in the Aquifer. Most of the common predominant COCs identified in Section 5.2.1.3 and additional Operable Unit 5 CPCs, which were more persistent or had a larger extent of contamination, were simulated and evaluated by using the main groundwater transport model (i.e., SWIFT Great Miami Aquifer model). The constituents simulated by using the SWIFT aquifer model are designated as the primary constituents for modeling in the groundwater pathway. A supplemental model (i.e., ECTran) was used to provide estimates of exposure point concentrations of other secondary CPCs vertically through the overburden, Paddys Run, and SSOD. The ECTran model was also used to screen and simulate lateral migration of more mobile constituents in the perched groundwater zones in the glacial overburden.

As previously mentioned, the upper surface of the glacial overburden contains secondary porosity features (fractures and bioturbations). The density of these secondary porosity features decreases with depth and essentially controls the depth of active infiltration (Section 3.6.1). The contaminant migration pathway, for the purpose of modeling, begins beneath the highly fractured surface layer. No credit was taken for contaminant attenuation by this fractured zone. This provides the simulated effect that contaminants which infiltrate the ground surface would instantaneously move through the near-surface fractured zone.

Five representative cross sections of the vadose zone and the layer distributions throughout the Operable Unit 5 area were created for infiltration modeling with HELP and travel time and decay screening. The thickness and layer structure of the vadose zone was then defined in more detail with a 125- by 125-foot grid in the SWIFT/ODAST model and the three-dimensional GO/UGMAS model for determining the contaminant loading through the vadose zone.

The saturated portion of the Great Miami Aquifer was represented by six model layers in the SWIFT model. These model layers were designed to coincide with the depth of Type 1, Type 2, Type 3 and Type 4 monitoring wells, the clay interbed, and the top-of-bedrock contours. Higher surface recharge rates through surface water bodies (i.e., Paddys Run, SSOD, and Great Miami River) were incorporated in the model.

F.3.3.3 Groundwater Fate and Transport Model Descriptions

A description of each of the models used in the groundwater fate and transport modeling is contained in the following sections.

F.3.3.3.1 HELP Model Description

The HELP model is used in the Operable Unit 5 analysis to define infiltration rates (seepage velocities) for use in travel time screening and in vadose zone modeling with ODAST.

The HELP model (EPA 1984) is a quasi two-dimensional hydrologic model of water movement across, into, through, and out of a waste area. The model accepts climatologic, soil, and design data and simulates a number of hydraulic processes including surface storage, runoff, infiltration, percolation, evapotranspiration, soil moisture storage, and lateral drainage. The systems that can be modeled by HELP include various combinations of vegetation, cover soil, waste cells, special drainage layers, and relatively impermeable barrier soil.

The HELP model is designed to perform water-budget calculations for a system having as many as nine layers by modeling each of the hydrologic processes that occur. Each layer must be identified as either a vertical percolation, lateral drainage, waste, or barrier soil layer. The identification of each layer used in the model is critical because the program models water flow through the various types of layers in different ways. Runoff is computed using the Soil Conservation Service (SCS) runoff curve number method by considering daily precipitation totals. Percolation and vertical water routing are modeled using Darcy's Law for saturated flow with modifications for unsaturated conditions. Evapotranspiration is estimated by a modified Penman method adjusted for limiting soil moisture conditions.

The HELP model output consists of input data echo, simulation results, and a summary. The input data echo includes all the information used for input including the values chosen from the model's

built-in data base and any data input manually. Following the input data echo, the program produces a table of the daily results, monthly totals, and annual totals for each year if the options for detailed output are used. Following these outputs, the summary output is given. The summary includes average monthly totals, average annual totals, and peak daily values for the simulation variables. The average monthly totals report precipitation, runoff, evapotranspiration, percolation through the base of each layer, and lateral drainage through each layer for a particular month for all the years of a simulation. The average annual total reports the values on an annual basis. The summary of peak daily values represents the maximum values that occurred on any day during the simulation period.

F.3.3.3.2 ODAST/SWIFTLOAD Model Description

The ODAST/SWIFTLOAD model is used in the Operable Unit 5 analysis to define vertical contaminant transport from contaminated soil or perched water to the Great Miami Aquifer. ODAST, which is a subroutine of SWIFTLOAD, evaluates the basic 1-dimensional analytical solute transport equation as a function of seepage velocity, dispersion coefficient, source decay, retardation factor, depletion time, and source rate. SWIFTLOAD has been developed as a data processing program to create an appropriate input file for the SWIFT model and runs ODAST as a subroutine on a cell-by-cell basis (SWIFTLOAD used the same 120 by 112 grid as the SWIFT Great Miami Aquifer model). SWIFTLOAD reads an external file defining the layer thickness for each model cell and hydraulic and transport properties for each block.

The ODAST computer code is based on the solution originally developed by Ogata and Banks (1961) and calculates the normalized concentrations of a given constituent in a uniform flow field from a source having a constant or varying concentration in the initial layer. ODAST has been extensively verified against STRIP1B (Batu 1989).

The ODAST model implements an analytical solution to the partial differential equation

$$D\frac{\partial^2 C}{\partial x^2} - V\frac{\partial C}{\partial x} - \lambda RC = R\frac{\partial C}{\partial t}$$

where

C = solute concentration (mass/volume)
and with the constant coefficients
D = dispersion coefficient (length^2/time)
V = seepage velocity (length/time)

000944

R = retardation factor (dimensionless)
λ = solute decay factor (time^{-1})

The solution must satisfy the initial and boundary conditions

$$C(x,0) = 0$$

$$-D\frac{\partial C}{\partial x} + VC\,|_{x=0} = \begin{cases} VC_O\, e,^{-\alpha t} & 0 \le t \le \tau_O \\ 0, & t > \tau_O \end{cases}$$

$$\frac{\partial C}{\partial x}|_{x\to\infty} = 0$$

where the constants

C_o = initial source concentration (mass/vol)
α = source depletion factor (time^{-1})
τ_o = source depletion time (time)

The solution is obtained using a Laplace transform technique and involves products of exponential and complementary error functions (Javandel et al. 1984). The solution for C is divided by C_0 to yield normalized concentrations.

Because the coefficients in the governing equation are constant and the solution must satisfy a zero concentration gradient condition as x approaches infinity, ODAST is only strictly applicable to one-dimensional transport in homogeneous, semiinfinite media. However, the present application of ODAST is intended only to provide conservative estimates of aquifer mass loading histories.

ODAST model runs can be executed for only one constituent at a time, and the solution may be applied over any arbitrary segment of a waste area that is judged to contain an unchanging subsurface. A superposition technique is used to combine calculations for the two homogeneous layers comprising the vadose zone conceptual model. The ODAST solution at the bottom of Layer 1 is divided into 1000 small time steps and a Layer 2 run is performed for each of these steps. Each of these Layer 2 runs assumes no source decay, a recharge period 1/1000 of the total modeling time, and a source concentration equal to the averaged Layer 1 solution for that time period. The solution at the bottom of Layer 2 is obtained by summing the results of the 1000 Layer 2 runs at specified time steps. For

RI/FS modeling, concentrations are calculated up to 1000 years, typically in steps of 20 years. Constituents that migrate quickly, such as organics, require smaller time steps for accurate representation of loading curves.

Input parameters for ODAST are the dispersion coefficient, seepage velocity, retardation factor, source depletion time, solute decay factor, and source depletion factor. These are discussed below:

- Seepage velocity and the dispersion coefficient depend upon the characteristics of the waste area and the vadose zone medium. Seepage velocity is calculated as an empirical function of the percolation rate obtained from the HELP model, saturated hydraulic conductivity, and porosity (EPA 1988). The dispersion coefficient is obtained as an empirical function of seepage velocity (Biggar and Nielsen 1976).

- The retardation factor accounts for transport delays due to reversible reactions between the chemical constituent and the vadose zone solid matrix. It is thus dependent on both solute and medium characteristics, and is calculated as a function of the constituent's partitioning coefficient and the vadose zone bulk density and moisture content (Walton 1984 and Mills et al. 1985).

- The solute decay factor is constituent dependent. This parameter accounts for biodegradation in organics and radioactive decay in radionuclides and is zero for stable inorganics.

- Source depletion time and factor control the mass flux history of the constituent at the top of the modeled layer. Based on the upstream boundary condition, source mass flux decays exponentially. To calculate depletion time and factor for the waste at the top of Layer 1, the time-dependent expression for mass flow from the source is integrated from zero to the source depletion time. This integral is equated to the depleted mass of the constituent to provide a single equation in two unknowns. A second equation is obtained by arbitrarily specifying a mass depletion fraction. This is the level (very close to, but less than one) at which the source is declared depleted; technically, the source is depleted only as time approaches infinity. As stated previously, depletion factor is zero and depletion time is 1/1000 of the total modeling time for the Layer 2 runs.

F.3.3.3.3 GO/UGMAS Model Description

The GO/UGMAS model is used to assess the relative significance of potential transport pathways of the glacial overburden. There are multiple potential pathways from any near-surface waste source downward to the Great Miami Aquifer (Section 3.6.3). These pathways include:

- Vertical infiltration through the clay layers to the unsaturated Great Miami Aquifer

- Vertical infiltration through the clay layers to a sand lens and laterally along the sand lens which connects to the Great Miami Aquifer

- Vertical infiltration through the clay layers to a sand lens, laterally along the sand lens which connects to Paddys Run or the SSOD, and from either stream to the Great Miami Aquifer.

The GO/UGMAS model is a finite difference model representing the glacial overburden and the upper Great Miami Aquifer system which was recently created using the SWIFT code (DOE 1994b). A general discussion of SWIFT follows in F.3.3.3.4.

The modeled area in GO/UGMAS is approximately 2000 acres including the FEMP and immediate environs. The model's domain extends from the glacial overburden margin to the east, bedrock outcrop to the north, Paddys Run to the west and the glacial overburden margin and bedrock outcrop to the south.

The model was built on the same grid as the SWIFT Great Miami Aquifer model (120 x 112 grid blocks). The model domain is divided vertically into six layers. From the ground surface down, these six layers consist in general of: (1) a brown (fractured and oxidized) till layer, (2) a gray (unweathered) till layer, (3) a deltaic sand/lacustrine silt layer, (4) another gray till layer, (5) an upper Great Miami Aquifer sand layer, and (6) another upper Great Miami Aquifer sand layer, two feet in thickness, to provide greater accuracy in representation of water and solute exit fluxes at the bottom of the model. The thicknesses, lithology distribution, and lithology hydraulic properties were obtained from measured data in the Environmental Resources Management and Analysis Systems' (ERMA) geographical information system (GIS) database and from recent till characterization studies (DOE 1994a). Use of field data produced limited variations in the above general layer distribution. For example, in a few locations the weathering horizon dips down into Layers 2 and 3 and the deltaic sand/lacustrine silt in Layer 3 is of limited areal extent but vertically may appear in Layers 2 and 4. Because of the detailed information available in the ERMA GIS database, variations in thicknesses, elevations and lithologies on a block-by-block basis were included in the model.

Partially saturated regions (most notably the upper Great Miami Aquifer) are contained within the GO/UGMAS domain. Because SWIFT is designed for fully saturated media, simplifying assumptions were necessary to approximate flow and transport in a conservative manner. Likewise, simplifying assumptions were made to account for the effect of fractures and the transient nature of flow and transport in the glacial overburden. The primary assumptions of the GO/UGMAS Model include:

- The upper Great Miami Aquifer sands are assumed to be fully saturated with only vertical transport. Since saturated transport is faster than unsaturated transport under similar conditions, this assumption is a conservative representation of flow and contaminant transport throughout the unsaturated zone. In essence, this layer represents a time delay between the overburden and the saturated Great Miami Aquifer which can effectively be simulated with saturated conditions.

- The upper oxidized zone (Layer 1) was used to allow a free water surface in the model. Layer 1 may be highly fractured and will not provide an effective barrier to transport. Therefore, values of Layer 1 vertical hydraulic conductivity used in the model were raised to account for this. Again, this is a conservative representation of the system since the model assumed no attenuation in this layer.

- An equivalent porous medium approach was used to account for potential fractures through the glacial overburden. This approach was adopted because it is impractical to attempt to adequately characterize a fractured medium and to calibrate a fracture flow model. The modeling objectives were on a large enough scale that simulation of contaminant migration through an equivalent porous medium could effectively meet the modeling objectives.

- Steady state flow conditions were considered adequate to represent flow conditions in the GO/UGMAS. The modeling objectives were on a large enough time scale that simulation of contaminants moving under steady state flow conditions could effectively meet the modeling objectives.

Boundary conditions in the GO/UGMAS model consist of specified pressure conditions at the sides and bottom of the physical domain and specified net recharge at ground surface. Major drainage features at the FEMP are simulated as discharges internal to the model.

F.3.3.3.4 SWIFT Great Miami Aquifer Model Description

The SWIFT Great Miami Aquifer model is used for simulating 3-dimensional contaminant transport in the Great Miami Aquifer. The SWIFT code is a fully coupled, transient, 3-dimensional finite-difference model for groundwater flow and transport through both porous and fractured media. The mass transport equations solved include terms for convection, dispersion, retardation by sorption, and decay or degradation of the contaminant. The SWIFT code, originally developed by Sandia National Laboratory in the late 1970s for the high level waste program, has been revised several times to increase its capability and to change computer platforms. These revisions include the addition of fractured media, a free water surface, extended boundary conditions, conversion to Fortran 77, extended options for matrix solutions and postprocessing. Geotrans (1991) has converted SWIFT for use on 386 and 486 personal computers and made additional changes to improve user friendliness and input and output control, the most recent version being SWIFT 2.52 (Geotrans 1992).

SWIFT was selected from among several codes for use in developing a flow and transport model of the Great Miami Aquifer in the vicinity of the FEMP. Subsequent to selection of the code, SWIFT code was specifically verified for use at the FEMP (IT 1990). A model of the Great Miami Aquifer (using SWIFT) was originally developed and calibrated from 1988 through 1990 (DOE 1993a). This model building effort consisted of:

- Development and calibration of 2-dimensional and 3-dimensional regional flow models
- Development and calibration on a telescoped and more refined grid of a 3-dimensional flow model of the FEMP and its adjacent areas
- Development and calibration of 2-dimensional and 3-dimensional solute transport models on the more refined grid.

The original model consisted of five layers. The two uppermost layers represent the upper and lower parts of the upper Great Miami Aquifer, the middle layer includes a clay interbed that is present beneath the FEMP site, and the lower two layers represent the lower Great Miami Aquifer. The layers extended laterally into bedrock at the edges of the buried valley that contains the aquifer. This original FEMP steady-state flow model was calibrated to 1986 water elevation data.

Since that time, additional data have been collected, new wells have been installed, and a large-scale pumping test (South Plume pumping test) has been conducted. Based on these factors and agency comments, a model improvement program was initiated (DOE 1993b). The essential elements of this model improvement program were completed in March 1994 (DOE 1994e). The Operable Unit 5 RI modeling makes use of this "improved" model.

The model improvement program consisted of:

- The model grid for steady-state flow and solute transport was expanded. The previous solute transport grid of 78 cells by 102 cells was enlarged by adding a band approximately 5250 feet wide along the eastern side and a band approximately 1250 feet wide along the northern side. The new grid contains 120 by 112 cells, each 125 feet square. The layering of the model also has been refined. The five layers of the original model have been replaced with six layers to better match existing well screen elevations. This allowed field data to be more accurately depicted and provided better vertical control over contaminant dispersion.
- Geostatistical analysis has been conducted to understand and correlate the spatial distribution of key data sets. These data sets include the water elevation data and the

uranium analytical data from the Type 2, Type 3 and Type 4 monitoring wells. Calculations included the sample semivariogram, and kriging and cokriging estimators along with their estimation variance. This analysis was used to help determine calibration criteria and to identify areas of the site where lower confidence exists in the analyzed data sets.

- A transient flow calibration was performed using the South Plume pumping test results. Parameter values for porosity and rock compressibility were developed from this calibration. Because of the scale and orientation of the pumping test wells, a telescoped grid (25-foot cell size) was created in the south plume area to effectively simulate the results of the pumping test.

- A steady-state flow calibration was conducted using the expanded and reconstructed steady-state grid. Steady-state heads were matched to the established calibration criteria. This recalibrated steady-state model is the primary model used for flow and solute transport simulations.

- The solute transport model was recalibrated to determine reasonable values of K_d (for uranium) and dispersivity for a representative source loading. The range of acceptable uranium K_d values has been established by reviewing site data related to K_d and by reviewing sensitivity runs of previously used K_d values corresponding to retardation factors of 9 and 12.

- The historical source loading terms were decoupled from the model and monitoring data are used to define initial conditions of uranium concentrations. Results from the glacial overburden and Paddys Run models are used to define future loading terms.

- Sensitivity analysis was performed on horizontal hydraulic conductivity (K_h), ratio between horizontal hydraulic conductivity and vertical hydraulic conductivity (K_h/K_v), porosity, uranium distribution coefficient (K_d), and dispersivity (α) in order to understand the effect of variation of these parameters on the maximum concentration and transport of a normalized plume.

- Quality assurance/quality control procedures for modeling were defined to control and confirm the quality of the modeling effort.

New data sets have been used in the construction and calibration of the model. In summary, new data sets include:

- Monitoring data from the 1990 to 1993 time period
- Monitoring data from new wells installed since original calibration
- Results of additional aquifer analysis to define K_d
- Geostatistical analysis of data sets
- Results from the South Plume pumping test

- Results from construction and operation of the South Plume recovery well system
- Output from additional models (glacial overburden, surface water) to define hydraulic and solute loading terms.

Model simulations of the improved site SWIFT model were performed using SWIFT/386 on a Powerbox microcomputer or SWIFT III on a Silicon Graphics Computer (Unix based). Simulation execution times for 1000-year solute transport runs varied between 24 and 60 hours. These 1000-year simulations generated extremely large output files and require peripheral hardware. Output was written to files from which relevant data was extracted using data manipulation programs written for that purpose. Contour plots were made using SURFER for selected constituents at different simulation times. Report graphics were imported into Intergraph Work Stations for preparation of final graphics.

F.3.3.3.5 ECTran Model Description

The ECTran model is used for simulating 1-dimensional lateral perched water transport, 1-dimensional vertical vadose zone transport, 1-dimensional vertical surface water loading, and 1-dimensional lateral transport in the Great Miami Aquifer. The model is an efficient and robust groundwater contaminant fate and transport model implemented in Excel 4.0 which was developed to support the RI/FS processes at the FEMP. The Crystal Ball 3.0 add-on module for Excel can be used with the ECTran model to perform Monte Carlo simulations. The ECTran model is a screening-level model that can be used to supplement other more complex fate and transport models during parameter estimation, risk assessment, cleanup goal development, alternate concentration limit (ACL) determination, and stochastical sensitivity analysis. The model is based on straight-forward mass-balances and advection/dispersion analytical equations, but can be used to simulate a variety of complex conditions. The complete summary of the ECTran model's capabilities, development processes, and the proposed applications of the screening-level spreadsheet-based groundwater contaminant fate and transport model are presented in DOE 1993c.

Highlights of the ECTran model's capabilities include the following:

- Uses analytical 1-dimensional in each flow and transport model without dispersion in the vadose zone
- Uses analytical 1-dimensional in each flow and transport model with 2-dimensional dispersion in the saturated zone

- Accepts zone- and layer-specific contaminant initial concentrations, decay rates and distribution coefficients
- Model can be separately and flexibly applied in any localized source area
- Age of source can be considered to estimate the current downgradient concentrations
- Has the capability of including an additional/secondary source loading from the glacial overburden into the lower unsaturated layer
- Can be used to consider impacts of pumping and/or containment in the source area on the exposure point concentrations
- Uses any specified groundwater flow conditions directly
- Considers contaminated or clean upgradient groundwater recharge
- Uses the mixing depth concept in the saturated zone instead of the thickness of the entire saturated zone in the aquifer
- Calculates layer- and zone-specific contaminant concentrations vs. time
- Presents the output statistically and graphically without the need for postprocessing
- Calculates concentrations at the projected centerline of the contaminant plume
- Requires minimal run time so that many scenarios can be investigated.

ECTran model inputs include site-specific hydrogeologic and chemical information as well as physical information about the site. Hydrogeologic information such as vertical and horizontal hydraulic conductivity, hydraulic gradient, porosity, vertical and horizontal groundwater velocities, percent saturation, soil density, fraction of organic content, dispersion coefficient and infiltration rate, all necessary model inputs. The typical chemical information for model input varies depending on the type of chemical to be modeled (i.e., radionuclide, organic, or inorganic). For the Operable Unit 5 RI the typical chemical input includes K_d, half-life, and current source concentrations. Necessary physical information about the site which would be used as model input includes the areal dimensions of the source, detailed description of the underlying geology, the source area orientation with respect to groundwater flow, and its distance from the selected exposure point.

F.3.4 CONTAMINANT LOADING DETERMINATION

The first step in modeling any groundwater pathway is the delineation of source areas, solid-phase concentrations of these source areas, constituent masses for each source area, geochemical parameters

for each COPC, and initial concentrations for each COPC at each source area. In addition, initial concentrations of perched water and Great Miami Aquifer groundwater are needed to properly simulate future plume conditions. Finally, surface water bodies which receive contaminated surface runoff and perched groundwater seepage also load contaminants to the Great Miami Aquifer and these loadings need to be defined. Each of these contaminant and media conditions are described in the following subsections.

F.3.4.1 Primary and Secondary COPCs

Table F.3.4-1 lists the 129 detected constituents in the Operable Unit 5 source areas. The contaminants in Operable Unit 5 originated from other Operable Units at the FEMP. Therefore, constituents of concern identified through the other operable unit risk assessments as causing the major portion of the risk may be expected to also cause a large portion of the risk at Operable Unit 5 receptors. These potentially higher-risk-generating constituents are designated primary COPCs. The remaining constituents with soil concentrations detected above background within the Operable Unit 5 media are designated secondary COPCs except those constituents which have a larger extent of contamination. Constituents are categorized so that resources may be appropriately focused on constituents that generate the large majority of the risk. For example, the SWIFT Great Miami Aquifer model, with its long run times and detailed output, is used first for the primary COPCs while the simpler and faster ECTran model is used for secondary COPCs.

F.3.4.2 Surface Soil Contamination Source Areas, Concentrations, and Inventories

301 Figure F.3.4-1 shows the general delineation of Operable Unit 5 contaminant source areas developed by considering the distribution of uranium contamination in the environmental media. Two-dimensional contouring and 3-dimensional solid block modeling of uranium concentrations in the soil were both used in this process. In general the area west of Paddys Run is relatively clean and does not contain significant amounts of contaminants that can create long-term cross-media impacts. Therefore, this area is not included in the fate and transport modeling domain. However, this area was evaluated for direct contact and exposure scenarios in the baseline risk assessment. It was assumed that the surface concentrations for other contaminants would generally follow the same pattern of contamination as the uranium. The uranium concentrations were plotted on a map of the FEMP and then contoured. Based on the uranium contours, the contaminant source areas were roughly broken into low, medium, and high levels.

The low range included values from background to 10 pCi/g of uranium, the medium from 10 pCi/g to 50 pCi/g, and the high range of 50 pCi/g or higher. The 10 and 50 pCi/g limits were chosen for convenience. The contours levels used to determine the ranges should not significantly affect the results because every area within each source area was assigned a source concentration in the modeling. No valid surface soil sampling results are excluded from the calculation of the source concentrations because of the source area delineation. The source areas were only used to group the data so that the concentration with each source area would be more uniform and more closely match the model assumptions of uniform concentration within an area. Within the production area, the delineation of the source areas did not strictly follow uranium concentration contours but also took into account locations of buildings and the historical use and purpose of various facilities within the production area.

Table F.3.4-2 summarizes the general physical and chemical conditions in these conceptual Operable Unit 5 primary contaminant source areas. The contaminants in the Operable Unit 5 area, as indicated by thicknesses in Table F.3.4-2, are generally confined in the surface soil (less than 1.5 feet) except in localized areas in the production area. Twenty-seven Operable Unit 5 shallow contaminant source areas were defined based on the contouring of total uranium shallow soil sampling data (less than 1.5 feet deep) and the boundaries of surface water drainage basins (see Figure F.3.4-1). Five additional deeper source areas of contamination were defined based upon three-dimensional solid block modeling of uranium in the glacial overburden.

306 Based on available soil data, 1.5 feet is a conservative estimate of the average thickness of contaminated soil outside of the former production area and other operable units which become the source of future Operable Unit 5 contamination. Additional field data outside the production area collected to support the Operable Unit 5 FS show that at 30-inch depths most of the soil samples contain uranium concentrations close to background level and have K_d values close to 1000 L/kg (i.e., contain very insignificant amounts of leachable uranium). The low K_d environment (i.e., not favoring adsorption) in the deeper soil described in F.3.1 actually kept most of the contaminant in the leachate when uranium migrated through the overburden in the past. Therefore, the deeper soil is relatively clean when compared to the surface soil and does not contain significant amounts of contaminant mass that can affect the modeling results for future conditions. Therefore, soil below 1.5 feet outside of the production area and other operable units was not treated as a future contaminant source.

311 Constituent mass in each source area was calculated from the representative concentration, usually the 95 percent upper confidence limit (UCL) determined by statistical analysis, and the mass of soil within the source area. Soil mass is derived from the volume of each source area and the bulk density of the soil within the area. Table F.3.4-3 summarizes the range of representative source concentrations and contaminant inventories for each COPC. Detailed source area delineation and source-area-specific representative concentrations of CPCs for the groundwater pathway are included in Attachment F.3.III.

F.3.4.3 Determination of Geochemical Parameters and Source Leachate of Contaminated Soil

This subsection discusses the general approach for determining constituent-specific zonation and values of the major geochemical parameters. Because uranium is the predominant groundwater contaminant at the FEMP and is the focus of the solute transport model recalibration task, Attachment F.3.I summarizes the available site-specific information on geochemical parameters for uranium. Results of a screening model confirmation process for these parameter values of uranium is also presented in Attachment F.3.II.

Major Parameters

Major constituent-specific geochemical parameters required in the groundwater fate and transport modeling include percent of extractable contaminant (K_e) in the sources, leaching coefficient (K_l) in the sources, solid-liquid partition coefficient (K_d) in the sources and the migration media, and retardation factor (R_d) in the migration media. The distinction between the parameters K_l and K_d is based on the type of contaminant solid that is present in the soil. For K_l, the contaminant may be present as particulate and adsorbed forms and the leaching coefficient measures contaminant mobilization due to both dissolution and desorption. The K_d is a measurement of solely adsorption/desorption equilibrium between soil and water and solid contaminant in excess of background is present only as adsorbed form. These parameters have significant impacts on the estimates of contaminant mass, concentrations, and loading and migration rates; therefore it is important that parameter values are properly assigned.

Source Leaching Coefficient (K_l)

309 In the Operable Unit 5 fate and transport model describing uranium migration in the glacial
310 overburden, K_l was used to define the initial aqueous loading of uranium. Uranium K_l was determined either by using laboratory tests or calculations of field data. The laboratory method used

batch tests that mixed waste or contaminated soil with a distilled water solution adjusted to a pH of 5.6 with sulfuric acid. The K_l was calculated by dividing the uranium concentration on the solid (only uranium in excess of background) by the uranium concentration in solution. For the second method, the in situ leaching coefficient was determined by dividing the uranium concentration for the contaminated soil (only uranium in excess of background) by the uranium concentration in perched groundwater contacting the soil. Figure F.3.2-2 shows the zones of uranium K_l or K_d values for the FEMP. Distribution of site-specific values of uranium K_l and K_d is discussed in Attachments F.3.I and F.3.II. K_l values obtained from soil and perched groundwater data are in very good agreement with the K_l determined by using batch tests. In general, K_l for contaminated soil with soluble uranium are between 5 and 30 (see Table F.3.II-6) when a geometric mean of K_l^{calc} equals 14 (see Table F.3.II-2). K_l for contaminated soil with nonsoluble uranium are between 147 and 1870 (see Table F.3.II-6) when a geometric mean of K_l^{calc} equals 325 (see Table F.3.II-2).

For other contaminants, K_d values in the media were used to approximate source K_l values. This is a very conservative approach for modeling to support the baseline risk assessment because, for any contaminant, K_l is at least as high as and usually higher than K_d by definition. Using the lower K_d value instead of K_l for a given source solid concentration, a higher source leachate concentration can be generated in the fate and transport model. As a result, a higher receptor concentration will be predicted.

Solid-Liquid Partition Coefficient (K_d)

Solid-liquid partition coefficients are used in fate and transport modeling to simulate the reversible adsorption/desorption processes of contaminants. K_d is commonly defined as the constant ratio between solid-phase and dissolved-phase concentrations of a chemical at equilibrium in fate and transport models (i.e., a linear isotherm). Therefore, chemicals with higher K_d values are more likely to be adsorbed onto soil materials and thus have less potential to migrate in the subsurface. K_d for radionuclide and inorganic constituents is dependent on the medium types and conditions. K_d for an organic constituent is usually calculated using the constituent-specific octanol/water partition coefficient (KOW) and area-specific fraction of organic content (FOC) as shown in Appendix F.2.3.2.

Percent of Extractable Contaminant in the Waste Materials (K_e)

Although the adsorption/desorption process is usually considered to be reversible in fate and transport modeling, generally the longer a contaminant remains adsorbed to the surface of a solid the more

likely it is to be incorporated into the solid by surface reactions where it is no longer available for desorption under environmental conditions. Therefore, an estimate of the percent of extractable contaminant in the sources, which are usually solid-phase waste or soil, is required to determine the contaminant mass available for transport and leachate concentration. Although site-specific information has been collected for the K_e of uranium, to be conservative, K_e was not applied for any constituent (i.e., assumed as 100 percent) in the Operable Unit 5 RI modeling. If K_e was applied in the modeling K_e and K_d would only have been determined for the extractable portion.

Retardation Factor (R_d)

The contaminant travel time from a source area to the exposure points is one of the major concerns of risk assessment. For determining the contaminant travel time, the retardation factor is defined as the ratio between the groundwater flow velocity and chemical migration velocity through the soil matrix. Because most contaminants have higher tendencies to adsorb to soil than remain dissolved in water, they usually migrate slower than water in the subsurface environment. Therefore, R_d is usually greater than 1. In fate and transport modeling R_d is estimated by considering both the contaminant characteristics (i.e., K_d) and the soil properties such as dry bulk density and moisture content of the soil.

Zonation of Values of Parameters

In reality, none of the geochemical parameters discussed here are spatially invariant. However, because of the complexity of the soil matrix, simplifications of the natural systems are necessary in fate and transport modeling. The first simplification process is to determine the zonation of each major geochemical parameter. Zonation of geochemical parameters consists of dividing the modeling domain into manageable zones of different geochemical conditions and assigning values of model parameters based on available chemical and geological information. Zonation for geochemical parameters (i.e., K_d and R_d) is chemical-specific and usually assumed temporally constant in fate and transport models.

For the simulation of contaminant migration, parameter values are assigned to each geological unit separately (i.e., glacial overburden, unsaturated Great Miami Aquifer, and saturated Great Miami Aquifer). However, uniform contaminant-specific values of K_d and R_d in a geological unit will be used for all the contaminants except uranium. Further zonation of parameter values for a contaminant

will only be considered when field data shows significant parameter variations of the parameter in a geological unit (i.e., order of magnitude differences).

After zones are identified, zone-specific values of each geochemical parameter are assigned for every COC. Values are obtained from field tests, laboratory experiments, model calibrations, previous studies with similar conditions, or literature searches. In order to ensure that the fate and transport modeling results are acceptable for risk assessment, important guidelines to be followed in assigning the values and zonation of contaminant-specific geochemical parameters are:

- Use site-specific values when available.
- Select the most conservative assumption/estimate based on performance measures such as contaminant exposure point concentrations or travel times to exposure points when evaluating parameter/zonation choices.
- Verify modeling results by comparing with available measured conditions.

Based on the types and amount of available site-specific data and the extent of contamination, different approaches will be used to assign contaminant-specific values of geochemical parameters.

Contaminant loadings from other operable units which can impact the Great Miami Aquifer are included in the Operable Unit 5 RI fate and transport modeling. Contaminant-specific mass inventories, leachate concentrations, and loading rates used in previous modeling for the Operable Units 1, 2, and 4 RIs are directly imported into the Operable Unit 5 RI supplemental modeling characterization task (see Section 5.1.1). Therefore, geochemical parameters (i.e., K_l and K_d) will remain the same as previously assigned for these source areas. However, batch test results obtained for uranium in contaminated soil from Operable Unit 4 areas will be used instead of the K_l value (i.e., 1.8 L/kg) assumed in the previous Operable Unit 4 RI modeling. These batch test results became available after the Operable Unit 4 RI Report was completed.

Table F.3.4-4 shows the partition coefficient (K_d), the retardation factor (R_d), the decay factor, and the screening level for the Operable Unit 5 COPCs. Because of their dependence on media properties, K_d and R_d are reported for both vadose zone Layers 1 and 2 (i.e., glacial overburden and unsaturated sand and gravel). The screening level is shown in this table for convenience and will be used in the screening process (see discussion in Section F.3.5.2). As discussed above, uranium

parameters were based upon site-specific studies. The remaining constituent values are derived based upon literature values and site-specific physical and chemical properties (see Table F.3.4-5).

Source Leachate Concentration of Contaminated Soil

Unlike Operable Units 1, 2, and 4, however, it was not necessary to perform EQ3/6 geochemical modeling because Operable Unit 5 contaminants originated from waste storage and disposal areas in other operable units and are already in the environmental media. There is no significant change of chemical conditions to be quantified, such as between the interfaces of waste storage units and the glacial overburden occurring when contaminants were first released from their original sources. Also, the concentrations of contaminants already in the Operable Unit 5 environmental media can be expected to be much lower than their solubility limits. Therefore, no theoretical solubility limits determined by EQ3/6 modeling were used to constrain the contaminant concentrations in Operable Unit 5 fate and transport modeling. The revised process for determining the source leachate in the Operable Unit 5 baseline fate and transport modeling is shown in Figure F.3.4-3.

Initial leachate concentrations for contaminant source areas defined in Operable Unit 5 are determined following the procedure shown in Figure F.3.4-3. Contaminant concentrations in both groundwater and soil media were used to define zonation and values of K_l, K_d and R_d. Values and zonation of intermediate parameters such as FOC used in calculating K_d for organic contaminants, and soil porosity and moisture content used in calculating R_d are also determined in the process. Considerations of the various chemical forms/species in contaminant sources may result in different values of geochemical parameters for the same contaminant in different areas. When no site-specific or literature information is available for determining K_d for contaminants, conservative assumptions (e.g., 70-year rule) will be made for estimating the source leachate concentration and mass loading rates. When the 70-year rule is applied, the total mass of a contaminant in the source area will be released into the media in 70 years.

F.3.4.4 Surface Water Loadings

Surface water contaminant loading concentrations were determined from the results of the surface water flow and infiltration modeling described in Appendix F.2. Mass loading rates from the surface water runoff modeling were summarized for the Paddys Run reaches (i.e., C-D, D-E, and E-F in Section 5, Figure 5-28) and the SSOD which have streambeds which lie directly on unsaturated sand and gravel.

292 Contaminant loading through Paddys Run and the SSOD by surface water infiltration is assumed to not be retarded. Because groundwater flow is slower and contaminant migration in the Great Miami Aquifer is retarded, contaminant concentrations in the groundwater can become higher than the surface water concentrations due to accumulation of contaminant mass until a balance is reached between the inflow and outflow of contaminant mass in the Great Miami Aquifer in the vicinity of the SSOD. Before the balanced condition is reached, accumulated mass in the Great Miami Aquifer is distributed between aqueous and solid phases to maintain a constant ratio between the solid and aqueous concentrations (e.g., uranium K_d value of 1.78 L/kg). Therefore, both the solid and aqueous concentrations will increase before the balanced condition is reached. This phenomena is more significant during the simulation of the future condition in which highly contaminated runoff from the former production area can directly flow into the SSOD and recharge the Great Miami Aquifer.

Surface Water Loading in SWIFT Great Miami Aquifer Model

Table F.3.4-6 shows the surface water loadings to the Great Miami Aquifer model. Surface water contaminant loadings (see Appendix F.2) were defined for cases with the surface water retention basins (years 0 through 80) and without the surface water retention basins (years 81 through 1000). For the primary CPCs, constant surface water loadings (for the two time periods above) were directly input to the SWIFT model Layer 1 as mass loadings over time in model cells corresponding to the defined stream reaches. SWIFTLOAD was used to properly format these loading terms for the SWIFT model input file.

Surface Water Loading to Great Miami Aquifer in ECTran Model

312 The maximum CPC concentration at potential receptors due to surface water loading through channel streambeds is necessary to evaluate the risk to exposure at these receptors. Several reaches of surface water bodies (i.e., Paddys Run and the SSOD) at the FEMP load surface water and subsequently CPCs to the Great Miami Aquifer and these CPCs have the potential to eventually migrate to receptors. Reaches CD and DE of Paddys Run and the lower reach of the SSOD are the reaches where the maximum loadings occur because in these reaches the streams flow directly on the unsaturated zone of Great Miami Aquifer and the unsaturated zone has a significant thickness.

Contaminant loading does occur in reach EF of Paddys Run and has been included in the SWIFT Great Miami Aquifer model with the other reaches for primary CPCs, as summarized in Table F.3.4-6. ECTran modeling for other contaminants only estimated the maximum impacts due to

surface water contaminant loading to specific off-property receptor locations, as shown in Figure F.3.4-4. ECTran simulation of the surface water pathway does not include contaminant loading terms from reach EF of Paddys Run because they are usually smaller and already downstream from the preselected receptors along the southern fenceline.

To determine the maximum CPC concentration at a receptor, the maximum surface water mass loading rate was determined for each CPC at each reach and used to determine the maximum loading concentration. The maximum annual surface water contaminant loading rate occurred at either reach CD, Reach DE or the SSOD, depending on the CPC. However, a majority of the CPCs maximum mass loading rates occurred due to loading from the SSOD. In addition to determining the maximum loading rate, travel distance was also used to screen CPCs to determine the maximum potential concentration at the receptor. This screening was conducted because some CPCs with lower mass loading rates actually created higher concentrations at certain receptors, because the source was much closer to the receptor than the source with the highest mass loading rate.

The annual mass loading rates were combined with the annual infiltration rates through the total length of streambed to determine the average loading concentrations. The infiltration rates were taken from the calibrated SWIFT Great Miami Aquifer model. Table F.3.4-7 summarizes the maximum surface water contaminant loading rates used in the ECTran modeling. Three representative source areas from the SSOD and two source areas from both of the Paddys Run reaches (i.e., CD and DE) were selected for modeling the migration of contaminants according to the locations of three nearby off-property receptor wells. Figure F.3.4-4 shows the nearest potential receptors (i.e., the Knollman wells) of the CPCs due to surface water loading and the corresponding source areas along the SSOD and Paddys Run. The figure also shows typical migration pathways from the sources to the potential receptors. The dimensions of SSOD sources are 10 by 125 feet (width by length) and the Paddys Run sources are 25 by 125 feet. The 10-foot and 25-foot widths for the surface water bodies are the approximate widths of each surface water body, respectively. The 125-foot length is a representative length of the SSOD and Paddys Run selected for modeling.

F.3.4.5 Current Contamination in Perched Groundwater

Contamination in the perched groundwater zone was also evaluated to define the source terms for additional mass loading due to potential lateral migration to selected surface water exposure points. Perched water contaminant plumes were drawn to determine the source locations, dimensions, and

volumes. Maximum perched water concentrations for each of the plumes were then selected and used as the initial source leachate concentrations directly.

Perched groundwater source areas and concentrations for particular contaminants were determined by (1) plotting all well-specific maximum contaminant concentrations at the representative wells within the Operable Unit 5 area, (2) contouring the concentrations to determine the contaminant plumes, (3) selecting a representative area which encompasses each contaminant plume, and (4) determining the maximum of the well-specific concentrations within the plume.

ODAST/SWIFT-Specific Perched Groundwater Sources

Perched water source terms for the primary CPCs were located based upon concentration plots and the conceptual model. Perched water source terms were only located within infiltration Zone I, which has the 15-foot-thick brown/gray sand above the gray clay (see Figures F.3.2-2 and F.3.2-3). Contaminant masses of perched water (liquid and solid phase) for each SWIFTLOAD cell were determined based upon source volume of perched water, porosity, bulk density and partition coefficient (K_d). Because perched water is located above the gray clay (see Figure F.3.2-3), simulated perched water effectively added mass at the same location as the surface soil sources in the corresponding model cells.

F.3.4.6 Current Contamination in the Great Miami Aquifer

For the primary CPCs, initial conditions were defined for the Great Miami Aquifer model and modeling runs used a defined time equal to 0 as 1994. Field data and supplemental modeling characterization were used in determining these initial conditions (i.e., the conditions at 1994). Forty-year model runs were performed for the primary CPCs with the applicable loading from Operable Units 1, 2 and 4 to define present-day modeled conditions. In addition, monitoring well data for each primary CPC were contoured for Type 2, Type 3 and Type 4 wells. These monitoring well plume data were superimposed on the model grid and concentrations were assigned for each appropriate grid block. Because these three well levels correspond to revised SWIFT model Layers 1, 3 and 6, averaged values between these layer values were assigned for the intervening layers. As the final step, initial conditions were delineated in the SWIFT Great Miami Aquifer model as the highest concentration for a particular block from the 40-year model runs with loading from Operable Units 1, 2, and 4 and the gridded monitoring data.

For example, initial concentrations of uranium in the Great Miami Aquifer at the beginning of the modeled period were developed from the four sources listed below which are conservative and consistent with previous studies and activities.

- Source 1: Field results of total uranium (filtered and unfiltered) in Types 2, 3, and 4 wells in the Great Miami Aquifer from the 1993 data set
- Source 2: Uranium concentrations developed through geostatistical analysis of field data as presented in the SWIFT Great Miami Aquifer Model - Summary of Improvements Report (DOE 1994)
- Source 3: Results of groundwater fate and transport modeling for the Operable Unit 2 Remedial Investigation Report (DOE 1994d)
- Source 4: Results of groundwater fate and transport modeling from Operable Unit 1 Remedial Investigation Report (DOE 1994e).

Figure F.3.4-5 shows the general process used to develop the initial Great Miami Aquifer uranium concentrations. The 1993 data set for filtered and unfiltered groundwater samples from Type 2, Type 3 and Type 4 monitoring wells (Source 1) were combined into a single conservative depiction of the plume by taking the highest value at each location. Because Type 2 wells are screened at depths corresponding to Layer 1 of the SWIFT Great Miami Aquifer model and Type 3 wells are screened at depths corresponding to Layer 3 of the model, well monitoring data could be directly translated to their respective layers. There is no significant (> 10 parts per billion [ppb]) contamination detected in wells screened at depths corresponding to model Layers 4, 5, or 6. Grid files (on the 120 by 112 SWIFT Great Miami Aquifer model grid) were available from Sources 2, 3, and 4 because both the geostatistical analysis and fate and transport modeling used this grid. Grid files from Sources 2, 3, and 4 were electronically combined such that the highest value for each cell was retained. One area to the southeast of the site (generally east of State Route 128) and an area west of Paddys Run, which was identified by the geostatistical analysis of the 1993 data set as having elevated uranium concentrations, were disregarded due to a lack of corroborating well data. "Combined" files for Layers 1 and 3 were compared to contour maps from Source 1 for Type 2 and Type 3/4 wells. "Final combined" contour maps for Layers 1 and 3 were generated to conservatively present all the data from all four sources. The adjusted contours were then electronically converted back to individual grid (cell by cell) values. Layer 2 initial concentrations were generated by averaging the final combined concentrations for Layers 1 and 3. Final contour plots of initial uranium concentrations in model Layers 1, 2, and 3 are shown in Figures F.3.4-6, F.3.4-7, and F.3.4-8,

respectively. Because data Sources 2, 3, and 4 do not contain significant values of uranium concentration in the lower Great Miami Aquifer, these layers (i.e., Layers 4, 5, and 6) were entered without an initial concentration and contour plots are not presented.

Table F.3.4-8 summarizes the initial conditions, including total mass and maximum concentration of each primary CPC, specified in the SWIFT Great Miami Aquifer model. Figures F.3.4-9 through F.3.4-14 show the initial plumes for the primary CPCs. These plots only show the Great Miami Aquifer model Layer 1 initial concentrations; however, initial conditions were input for all six model layers using the process described above. These plots represent the primary CPCs that had initial concentrations above background based upon monitoring data and results of supplemental modeling characterization; zero initial conditions were used for other CPCs.

F.3.5 SIMULATION OF VADOSE ZONE TO GREAT MIAMI AQUIFER PATHWAY

As discussed above, three pathways for groundwater fate and transport modeling have been identified. One of these pathways consists of contaminant transport from the source, vertically through the vadose zone to the Great Miami Aquifer, and laterally in the Great Miami Aquifer to the receptor (Section 3.6.3). To simulate this pathway requires the HELP infiltration rate model, the ODAST/ SWIFTLOAD vadose zone model, and the SWIFT Great Miami Aquifer model or the ECTran model. Screening for this pathway is also conducted to reduce the number of CPCs that are modeled. This screening is based upon travel time, decay, and comparison to toxicity levels.

The steps involved and the detailed approach followed in simulating this pathway are described in the following sections. Infiltration rate and screening results are presented in this section. However, results from vadose zone modeling and Great Miami Aquifer modeling are presented in Section F.3.7.

F.3.5.1 Determination of Infiltration Rate

HELP modeling simulations were performed for the 5 zones (discussed in F.3.2) to determine an annual infiltration rate through the glacial overburden and unsaturated Great Miami Aquifer. Table F.3.5-1 shows the assumptions and results of the HELP modeling.

SCS runoff curve numbers are calculated based on an area-weighted average of individual curve numbers for several ground cover types. Areal photographs determine the percentage of industrial

space, open space, woods-grass, woods, or meadow within each zone. The curve number for the entire zone is the area-weighted average of all ground cover types found within the zone.

314 Porosity values of 0.2 for the clay unit and 0.3 for the sand unit were used. Total porosity for the gray clay was calculated to range from 23 percent to 30 percent, with an average of 26 percent (see Section 3.6.1). For modeling infiltration it was assumed that effective porosity was 20 percent. This represents a 23 percent decrease in porosity from the calculated average of 26 percent. Infiltration was modeled using a smaller porosity because effective porosity for clayey units is usually smaller than total porosity and seepage velocity is inversely proportional to effective porosity; the smaller the effective porosity the faster the seepage velocity and the faster the infiltration. The ratio of field capacity to porosity and wilting point to porosity was maintained from the approach followed by the Risk Assessment Work Plan Addendum (DOE 1992). Wilting point and field capacity values were then calculated using the aforementioned scaling ratio and porosity data specified above.

The climatological data for Cincinnati, Ohio from 1974 to 1978 was used for all simulations. An initial moisture content was assumed for each layer. Consecutive 5-year iterations were performed using the final moisture content of the current iteration for the initial moisture content of the next iteration. "Steady state" is achieved when the final moisture content after a 5-year simulation is equal to the initial moisture content of that iteration.

Results showed infiltration rates ranging from 4.92 to 7.67 inches/year. The highest values were found in Zones III and V. As stated above, Zone V represents a small area within Zone III where the gray clay had degraded and this degraded clay had a higher hydraulic conductivity by 3 orders of magnitude.

Initially, it appears counter-intuitive that these two areas have the same infiltration rate. However, upon closer examination, these consistent results can be explained. Evapotranspiration for both cases accounts for over 32 of the 40 inches per year of rainfall. Evapotranspiration is primarily a function of leaf area index and evaporative zone depth which were fixed for both cases. This large lost fraction is not mitigated by a higher hydraulic conductivity in a relatively deep layer, i.e., once a parcel of water has reached a depth of 20 feet (the bottom of the brown clay/sand), it can no longer be evaporated. Based on the modeling assumptions, there are no lateral drainage layers to release water. Therefore, its only option is to infiltrate.

Closer inspection of the output showed the brown clay/sand in the Zone III case was not completely saturated. Therefore, the Zone III case was not "backing up" water so increasing conductivity only had a minor effect. In addition, output showed that the Zone V case resulted in slightly lower moisture contents in the brown clay/sand and the gray clay layers than the Zone III case, indicating that the higher conductivity was facilitating the release of water to a small degree.

F.3.5.2 CPC Screening

The primary purpose of the fate and transport modeling is to provide predicted concentrations of key, risk-causing constituents so that overall risk may be determined. Because the modeling is resource intensive and because constituent lists are lengthy, screening steps were undertaken to eliminate constituents that pose little or insignificant risk. By reducing the number of constituents that are modeled, the analysis is allowed to focus on the constituents that cause the highest percentage of the risk. Because the screening process is not as sophisticated a process as the modeling, these screening steps are conducted using conservative assumptions to prevent screening out constituents that should be modeled.

Figure F.3.5-1 shows the approach that has been followed in screening out constituents and the four screening steps that remove DCs from further consideration:

- Prescreening and background screening that remove constituents that are not hazardous or with maximum concentrations below background or drinking water standards (performed and presented in other sections of the RI); DCs that pass this screening are designated COPCs
- A screening process that eliminates constituents with all initial leachate concentrations at the source below prescribed toxicity levels
- A screening process that eliminates constituents with a travel time from the source to the Great Miami Aquifer greater than 1000 years or that decay significantly in the glacial overburden within 1000 years
- A screening process that eliminates constituents with all leachate concentrations entering the Great Miami Aquifer from the vadose zone below prescribed toxicity levels. COPCs that pass this screening are designated CPCs.

A separate screening process removes constituents with surface water concentrations below toxicity levels. This screening process is explained in Appendix F.2.

Each infiltration zone is treated separately in these screening analyses (see Section F.3.5.1). If any infiltration zone fails a particular screening, then that constituent is maintained for subsequent analysis and becomes a final CPC.

Prescreening and Background Screening

Prescreening and background screening are performed before the groundwater fate and transport modeling process on the validated sampling and analysis data sets. Each constituent from the data set is evaluated based on the criteria defined in the Risk Assessment Work Plan Addendum (DOE 1992). At this stage in the process, three decisions are made:

- Constituents that are nutrients at or below drinking water standards are screened out
- Constituents that are not detected in any sample are screened out
- Constituents with concentrations determined to be below background concentrations are screened out.

The constituents that "pass" the prescreening and background screening are designated "COPCs." A total of 125 DCs were defined for Operable Unit 5 source areas. These potential COPCs included 18 radionuclides, 84 organic constituents, and 23 inorganic constituents (see list of chemicals on Table F.3.5-2).

Travel Time Screening

Constituents are screened based upon travel time to determine those that would not reach the Great Miami Aquifer within the time period of interest (1000 years) in significant concentrations under conservative conditions. Travel time screening considers both physical time of travel through the vadose zone and radiological and organic decay over this time period.

Travel time screening is performed on COPCs based on distance, retardation factor, velocity, and dispersion. Any constituent that fails to reach the Great Miami Aquifer in 1000 years is screened out. A second screening process involves comparing the organic or radiological decay constants for constituents to the minimum calculated travel time. If a constituent has gone through 30 half-lives during this travel time, then it is screened out due to the negligible mass remaining.

Variables that are used in the screening step are:

- Retardation factors for each layer
- Soil seepage velocity for each layer (V)
- Soil thickness (L) for each layer
- Dispersion coefficient for each layer (D_L).

The assumptions and calculated parameters for travel time screening for the infiltration Zones I to IV are shown in Table F.3.5-3. Infiltration Zone V was not considered in the screening process because Zone III has identical layer thicknesses and infiltration rates (see Table F.3.5-1). Retardation factors and decay coefficients used in the screening are listed in Table F.3.4-4. These values are either from the Risk Assessment Work Plan Addendum or derived from the literature and calculated based upon site properties (Section F.3.4).

The mean travel time for a non-decaying CPC is R_1*L1/V1 + R_2*L2/V2 (see Table F.3.5-3 for definitions). However, the first arrival of the solute will take less time because of dispersion processes. Brenner (1962) found that a characteristic dispersion parameter, defined by V*L/4*D (referred to as P), can determine how much sooner the dispersion front will arrive than the average water particle (based on the mean travel time). Brenner created tables of P versus a factor, M. This factor can be multiplied by t_{tm} to give a time at which the exiting concentrations will be negligible. Consequently, the screening process sets M_{tm} at 1000 years, at which point exiting concentrations caused by the dispersion front will be negligible.

Table F.3.5-2 shows the results of the travel time screening. The travel time screening removed 87 of the 125 DCs.

Initial Concentration Toxicity Screening

Toxicity screening is performed on the COPCs that survived the travel time screening by comparing the initial concentrations for the vadose zone model with 10^{-7} risk- (or HQ=0.1) based numbers. These risk-based numbers are derived by dividing the 10^{-6} risk- (or HQ=1) based concentrations for tap water (EPA 1993) by 10. Because initial source concentration cannot increase in concentration in transport through the vadose zone, then source concentration represents a theoretical maximum concentration in the aquifer. If the initial concentrations for all waste areas is less than the risk-based number, then the constituent is not modeled further. If any waste area includes a value greater than

the 10^{-7} risk- (or HQ=0.1) based concentration, then the constituent is still modeled for all the source areas because modeled concentrations from the different source areas could be additive. These screening levels are defined in Table F.3.4-4.

Table F.3.5-2 presents the results of the initial concentration toxicity screening. Of the constituents that survived the travel time screening, 10 additional organic compounds were screened out based upon a comparison of leachate and toxicity levels.

Vadose Zone Model Toxicity Screening

Before performing aquifer modeling, the output from the vadose zone model (i.e., ODAST/ SWIFTLOAD model) is again compared to the toxicity screening levels in a manner similar to the initial concentration toxicity screening. Because concentrations can only further dilute when leachate mixes with the aquifer waters, this screening step removes constituents that will clearly be below the 10^{-7} risk- (or HQ=0.1) based standard in the aquifer. To perform this screening, the maximum output from the vadose zone model for a particular constituent is compared with the 10^{-7} risk- (or HQ=0.1) based standard. If this maximum value is below the standard, then the constituent is screened out and is not modeled further.

Table F.3.5-4 shows the detailed results of the second toxicity screening. Of the 28 constituents that were modeled in ODAST/SWIFTLOAD, 14 were screened out based upon a comparison of the maximum ODAST/SWIFTLOAD output concentration versus the toxicity screening level. Table F.3.5-2 summarizes these results.

Summary of Vadose Zone CPCs

Table F.3.5-5 shows the constituents that have passed the screening for the vadose zone pathway and the approach that is being followed for modeling these constituents. This table presents a summary of the results presented in Table F.3.5-1. Based upon the screening steps described above, 14 of the original list of 125 DCs will provide loading to the Great Miami Aquifer higher than 10^{-7} (or HQ=0.1) toxicity levels. Other CPCs will load contamination to the Great Miami Aquifer due to surface water infiltration. These constituents also require modeling. As shown in this table, the primary constituents are modeled using the SWIFT Great Miami Aquifer model while an alternative modeling approach using ECTran is used for the secondary CPCs (see Section F.3.3).

F.3.5.3 Vadose Zone Modeling

Vadose zone modeling is performed to estimate contaminant loading rates to the Great Miami Aquifer from a given source as a function of time. The overburden may have great capacity for immobilization and retardation of contaminants due to adsorption, precipitation, biodegradation, and radioactive decay. This capacity to prevent or slow the movement of contaminants to the aquifer is evaluated with respect to future risk.

Contaminant travel through the glacial overburden and unsaturated Great Miami Aquifer is simulated by ODAST which is a subroutine of SWIFTLOAD. SWIFTLOAD has been developed to create an appropriate input file for the SWIFT model and runs ODAST on a cell-by-cell basis (SWIFTLOAD using the same 120 by 112 grid as the SWIFT Great Miami Aquifer model). SWIFTLOAD reads an external file defining the layer thickness for each model cell and hydraulic and transport properties for each block. The thicknesses of Layer 1 (gray clay) and Layer 2 (unsaturated Great Miami Aquifer) were set for each block based upon a gridding of surfaces developed during the characterization of the glacial overburden. These thicknesses vary for Layer 1 from approximately 5 to 38 feet and for Layer 2 approximately from 7 to 38 feet.

The site is partitioned into 27 shallow contamination zones each covering a unique area. This same domain of waste areas in covered by five independent infiltration rate zones (see Figure F.3.2-2). A grid with 125- by 125-foot cells (with identical X-Y coordinates as the SWIFT Great Miami Aquifer model) is superimposed on this Operable Unit 5 domain. Each model grid block is assigned an infiltration rate corresponding to its infiltration zone and an initial concentration and total mass corresponding to its concentration zone (see Section F.3.4). If a model grid block is partially covered by several concentration zones, it is assigned the values associated with the zone covering most of the model grid block.

In addition to the 27 shallow waste areas (assumed to be 1.5 feet deep), there are five deep source areas. These deep waste areas cover the same X-Y coordinates as certain shallow waste areas, but are greater than 1.5 feet deep. For modeling purposes these source areas have the same contamination levels as the corresponding shallow waste areas. For mass calculation, additional volume of soil is calculated as starting at a depth of 1.5 feet (the bottom of the shallow waste area; see Section F.3.4 for more detail). The total mass of contaminated soil is calculated assuming a constant bulk density for all contaminated soil. The total mass of each constituent in the soil is

calculated as the product of constituent solid concentration in the soil and the total mass of the soil. The total mass is assigned equally among the applicable grid cells in a particular waste area (see Section F.3.4). The infiltration rates for each zone are as shown in Table F.3.5-1. If the model grid block is located in infiltration Zone I, contaminated perched water is modeled as another source of mass loading for the primary CPCs. The total mass from the perched water source is the sum of the mass adsorbed to the solids and that found in solution, as determined with the partition coefficient. The perched water is loaded at the top of vadose Layer 1 which corresponds with the location of the sand layer in infiltration Zone I. If a block is modeled as having contaminated perched water, the initial concentration for that block is the perched water concentration.

With the assumptions described above, SWIFTLOAD is run for each CPC. The concentration at the bottom of vadose Layer 2 is reported in 10- or 20-year time steps. A 10-year time step is used for constituents with low retardation or short half-lives because travel through vadose Layers 1 and 2 occurs in a short time and smaller time steps yield a number closer to the true maximum. The concentration of each constituent at the bottom of vadose Layer 2 is compared to the screening concentration shown in Table F.3.4-4. If a constituent exhibited concentrations greater than the screening concentration, the mass loading portion of the SWIFT input file is created for concentrations greater than or equal to 1/1000th of the screening level. Otherwise, the constituent is "screened out" and eliminated from further modeling.

Additional loading from surface water is required for several constituents (see Table F.3.4-7). The additional mass from surface water is loaded directly to the Great Miami Aquifer and does not pass through vadose Layers 1 and 2. Two loading rates are used; one for the time period that the storm water collection systems are in operation (0 to 70 years) and one for the time period in which they are inoperable (70 to 1000 years). The surface water modeling process that derived these loading rates is described in Appendix F.2.

For the 1000-year scenario, the projected concentration of the leachate entering the Great Miami Aquifer beneath the waste area was calculated by multiplying the normalized concentration (output of SWIFTLOAD) at the base of the lowest layer by the source term (initial contaminant concentration). The loading rates were calculated by multiplying the projected concentration beneath the waste area by the volumetric recharge rate from the source. The plots of loading rates versus time were then produced for the constituents which were projected to reach the aquifer within 1000 years. The peak

values in these plots were considered as the maximum loading rates to be observed in the aquifer for the contaminants over 1000 years.

F.3.5.4 Great Miami Aquifer Modeling

Both the 3-dimensional numerical SWIFT Great Miami Aquifer model and the 1-dimensional analytical ECTran model were used for simulating contaminant transport in the Great Miami Aquifer. The SWIFT model was used for the primary CPCs while the ECTran model was used for other CPCs that pass the screening (see Table F.3.5-5). The specific approach for performing each of these modeling efforts is discussed in the following sections.

F.3.5.4.1 SWIFT Modeling

The calibrated groundwater flow model for the FEMP is used to simulate the solute transport of the primary CPCs in the Great Miami Aquifer. A constant loading period was defined for SWIFTLOAD output for each CPC for the SWIFT modeling based upon source decay, retardation and constituent decay factors. Typically, a 5-year loading period was used for organics (low retardation factors) while a 20-year period was defined for radionuclides or metals (high retardation factors). Loading rates for each period were calculated by averaging the results of the vadose zone modeling over the length of each period. In this way, total mass inflow into the aquifer was conserved. Compounds were simulated for a total of 1000 years in the Great Miami Aquifer.

Loading rates to Great Miami Aquifer SWIFT model Layer 1 were defined based upon SWIFTLOAD results. Because the SWIFTLOAD and Great Miami Aquifer SWIFT models use the same grid, corresponding SWIFT Great Miami Aquifer cells were loaded based upon SWIFTLOAD output from vadose Layer 2. Loading periods were set from 5 to 20 years as discussed above.

In the case of U-234, U-235 and U-238, all three uranium isotopes were modeled as one compound to simplify the modeling and to allow the use of the previously calibrated total uranium solute transport model. Because the previous model uses total uranium and because the uranium at the FEMP is mostly U-238 (approximately 99 percent by mass), this approach was used.

Initial background concentrations of each compound in the aquifer were set at values based upon 40-year model runs and monitoring data (see Section F.3.4). Initial concentrations were read from an external file. The model simulations for the Operable Unit 5 CPCs used dispersivity values of

100 feet in the longitudinal direction and 0.1 feet in the transverse direction. These values were determined during the solute transport calibration for uranium and are based on values taken from literature review (DOE 1994e and Walton 1984). Distribution coefficients (K_d) and decay factors for simulated compounds were taken from site studies and literature reviews and are described in Section F.3.4.

Model simulations were performed using SWIFT/386 on a Powerbox microcomputer or SWIFT III on a Silicon Graphics Computer (Unix based). Simulation execution times varied between 24 and 60 hours and required extensive computing capacity. Output was written to files from which relevant data was extracted using data manipulation programs written for that purpose. Contour plots were made for selected constituents at different simulation times for CPCs from both the vadose zone and surface water pathways to represent plumes in space and plume changes over time. Report graphics were imported into Intergraph work stations for preparation of final graphics.

F.3.5.4.2 ECTran Modeling

The impacts to the overall Operable Unit 5 baseline risk assessment due to secondary CPCs (identified in Section F.3.4.1) and lateral perched groundwater migration are considered minor when compared to the primary CPCs and the vertical direct contaminant loading pathway to the Great Miami Aquifer. This conclusion is partially supported by field-observed current and past perched groundwater and Great Miami Aquifer contaminations and further confirmed by a 3-dimensional GO/UGMAS fate and transport model developed to simulate the uranium transport in the overburden. Therefore, complex ODAST/SWIFT modeling was only conducted for the primary CPCs in the vertical migration pathway through overburden which included soil leachate, perched groundwater, and surface water contaminant loadings and integrated all the source areas and receptors in a single model simulation.

As shown in Figure F.3.3-2 the overall modeling framework, the ECTran model, which is a simpler and much more efficient model, was then used to conduct fate and transport modeling for secondary CPCs in all the subsurface migration pathways and also the primary CPCs in the lateral perched groundwater migration pathway (see Section F.3.6). The purpose of using the ECTran model was to determine future contaminant conditions at specific receptor locations due to secondary CPCs or pathways not simulated in the ODAST/SWIFT modeling.

Migration Scenarios

Three different Operable Unit 5 subsurface contaminant migration pathways were investigated using ECTran, including:

- Case 1 - Combined vertical contaminant loading from leachate due to surface soil and perched water to the Great Miami Aquifer
- Case 2 - Contaminated surface water as a vertical loading to the Great Miami Aquifer
- Case 3 - Contaminated perched groundwater as a lateral contaminant loading to surface water.

Unlike the ODAST/SWIFT model, the ECTran model was used to simulate these cases in a loading- and receptor-specific manner.

The general hydrogeological conditions for each of the cases modeled using ECTran vary depending on the source loading areas. Cases 1 and 2 have slightly different loading conditions, but have very similar vadose zone migration and groundwater flow migration conditions. For Case 3, migration of the contaminants is limited to the perched water zone only; therefore only the flow conditions in the perched groundwater were applicable. The first two cases are described below.

Potential exists for secondary CPCs in the contaminated soil and perched water zone to move vertically into the Great Miami Aquifer through the overburden and be transported to off-property receptors. Within the former production area there are several areas which have surface soil and perched water contaminated with secondary CPCs.

For surface water to act as a vertical contaminant source to the Great Miami Aquifer, the surface water body must have a direct migration pathway to the Great Miami Aquifer. For several sections of Paddys Run and the SSOD the streambed is in direct contact with the unsaturated portion of the Great Miami Aquifer (i.e., unsaturated sand and gravel) and the potential exists for contaminated surface water in these streams to infiltrate to the Great Miami Aquifer. Once in contact with the Great Miami Aquifer the contamination could be transported downgradient to potential Operable Unit 5 on- and/or off-property receptors depending on the groundwater flow conditions. Therefore, for this case, vertical transport through the vadose zone and lateral transport through the Great Miami Aquifer, it was necessary to complete fate and transport modeling.

Conceptual Models

The conceptual model used in ECTran modeling to describe the fate and transport of a contaminant for a particular source-loading condition should identify and incorporate the key source information, hydrogeologic characteristics of the underlying vadose and saturated zones for the area, and any additional factors that control transport of CPCs to be modeled. Key source information includes current source concentrations and chemical information such as half-life, specific activity, and K_d. Hydrogeological information includes parameters such as vertical and horizontal hydraulic conductivities, groundwater flow directions, hydraulic gradients, porosity, bulk density, infiltration rates, and layer thicknesses. Other fate and transport information includes locations of the sources and the potential migration pathways. Refer to Sections 3.6.1 and 3.6.3 for background information.

The conceptual model used for the ECTran modeling of contaminated surface soil and perched water is illustrated in Figure F.3.5-2. As this figure shows, precipitation at the source area causes leachate to move into Layer 2 with a concentration of C_1. The leachate as well as perched water percolates through the unsaturated sand and gravel to the Great Miami Aquifer with a concentration of C_2 and then moves downgradient to potential receptors, such as the fence line or private wells, with Great Miami Aquifer contaminant concentrations of C_3, C_4, and C_5. No lateral migration of perched groundwater is considered in this conceptual model which provides the worst-case scenario for the vertical migration. Chemical/geochemical information for the CPCs was taken from Section F.3.4. Key hydrogeological information was taken from the calibrated SWIFT model input and used in the ECTran model, including hydraulic conductivities, gradient, and infiltration rates. In addition, output from the ODAST/SWIFTLOAD model was used as starting concentrations for Layer 2 (C_1 in Figure F.3.5-2). The ECTran model then calculated downgradient concentrations based on these inputs.

The conceptual model used for the ECTran modeling of surface-water loading to the Great Miami Aquifer and potential receptors is illustrated in Figure F.3.5-3. As can be seen in the figure, contaminated surface water (C_1) from the SSOD or Paddys Run reach percolates down through the unsaturated Great Miami Aquifer (C_2) to the saturated Great Miami Aquifer (C_3) and then migrates to its final receptor, the FEMP fence line or private well (C_4 or C_5). Chemical/geochemical information for the CPCs was collected from Section F.3.4. Key hydrogeological information was taken from the ODAST/SWIFT model input and used in the ECTran model. This information is summarized in Table F.3.5-6.

Loading of Surface Soil Leachate Concentrations to the Great Miami Aquifer

Based on the CPC screening presented in Section F.3.5.2, 10 CPCs are labeled as secondary CPCs and the ECTran model was selected to perform modeling for these CPCs. ODAST/SWIFTLOAD was used to perform vadose zone fate and transport modeling to determine CPC leachate concentrations for the screening and to be used directly in ECTran to simulate vertical loading to the Great Miami Aquifer due to surface soil and perched water. Representative CPC concentrations in the soil were loaded into the ODAST/SWIFTLOAD model for each of the SWIFT model grid blocks. Leachate concentrations were calculated using the model and then screened against the screening criteria (1×10^{-7} risk level or 0.1 HQ). Each of the blocks which had leachate concentrations exceeding the screening criteria were considered as potential sources.

Before using ECTran, an additional screening step was performed on the leachate concentrations simulated by ODAST/SWIFTLOAD. During the screening, the leachate concentrations were compared to 1×10^{-6} risk level or 1.0 HQ screening criteria and background leachate concentrations estimated from background surface soil concentrations. The purpose of the screening was to determine appropriate source sizes and to screen out leachate concentrations which do not impact the environment in excess of background. The Great Miami Aquifer will dilute leachate concentrations from ODAST/SWIFT by 1 to 2 orders of magnitude. Therefore, the 1×10^{-6} risk level or 1.0 HQ screening criteria was more reasonable for screening the leachate to determine areas which actually act as a source and will create CPC concentrations in the Great Miami Aquifer which exceed the 10^{-7} risk level or 0.1 HQ screening criteria. Of the 10 original secondary CPCs, four were screened out during the supplemental screening including boron, 1,2-dichloroethene, 4-nitroaniline, and chromium (Hex). One additional secondary CPC, magnesium, had a large source area even after screening and ECTran could not adequately model this CPC; therefore, this CPC was modeled using SWIFT.

The remaining five out of 10 secondary CPCs were modeled using ECTran. The ECTran model was used to simulate downgradient migration of the CPCs. Table F.3.5-7 presents a summary of the dimensions of the secondary surface soil CPC source areas. There are a total of five CPCs and 10 source areas. The source areas were determined based on the number of blocks in an area which exceeded the supplemental screening criteria. Blocks which adjoined each other were combined and considered as one large source area. The maximum leachate concentration for any block in one source area was selected as the representative concentration for the group of blocks. Also included in

Table F.3.5-7 are the travel distances from the source areas to the potential receptors along the groundwater flow path. Table F.3.5-8 presents the hydrogeologic information used for each of the source areas. Information such as hydraulic gradient, hydraulic conductivities, porosities, and infiltration rates are all included in this table. Refer to Section 3.6.2 for additional detail on hydraulic properties.

F.3.6 SIMULATION OF PERCHED GROUNDWATER TO SURFACE WATER PATHWAY

The objective of simulating lateral contaminant transport in the perched groundwater zone is to determine the potential for CPCs migrating out of the glacial overburden through interconnected coarse-grained sediment to reach surface water exposure points. The current CPC perched groundwater concentrations in the area between the production area and Paddys Run, where a significant coarse-grained sediment lens exists in the glacial overburden as shown in Figure F.3.6-1, were evaluated to define the sources of perched groundwater contaminants. All the COPCs in soil and perched groundwater in these areas were subjected to a screening process for selecting CPCs in the lateral perched groundwater migration pathway. Exposure point concentrations of the CPCs were then estimated by using the ECTran model.

F.3.6.1 Evaluation of Lateral Migration of Contaminants in Perched Groundwater

As described in Section F.3.4, the ODAST/SWIFTLOAD model used in the GO/UGMAS at the FEMP is restricted to the vertical dimension only. As such, it cannot answer important questions regarding the degree of horizontal (lateral) migration of contaminant plumes in perched groundwater zones. Although ODAST represents a simplified but conservative method of modeling fate and transport in the GO/UGMAS in the vertical direction, it was determined that Operable Unit 5 also needs to evaluate the lateral migration, especially for perched water contamination in the area where significant and far-reaching lens of coarser grained materials with an underlying clay layer exist in the overburden.

Three-Dimensional Uranium Transport Modeling

A 3-dimensional GO/UGMAS model was developed to simulate the perched groundwater flow conditions in the glacial overburden which underlie the FEMP. The initial purpose of this model was to quantify lateral contaminant transport in glacial overburden perched water zones due to loading at multiple, areal distributed sources of major COCs. Details of the development and applications of this model can be found in the Glacial Overburden/Upper Great Miami Aquifer System Model Report

(DOE 1994b). The results of applications of the 3-dimensional GO/UGMAS model indicate that lateral plume migrations of the major COC at the FEMP (i.e., uranium) and other constituents with similar transport characteristics (i.e., retardation factor in the overburden) are not significant in relation to vertical transport. For uranium, the plumes originated from the perched groundwater in the Plant 2/3 and Plant 6 areas did not reach the surface water exposure points (pilot plant drainage ditch and Paddys Run) or the FEMP property line in 1000 years even with very high lateral dispersivities in the modeling. On the other hand, the model demonstrates that significant amounts of uranium can reach the Great Miami Aquifer through vertical migration in the same time frame. It was then determined that a 1-dimensional vertical conceptual model of flow and transport through the overburden (i.e., ODAST) can be used as the main model for all the COPCs in the Operable Unit 5 for the RI fate and transport modeling as described in Section F.3.5.

One-Dimensional Screening Modeling for Other COPCs

Although it was determined by 3-dimensional transport modeling that it is unlikely for uranium in the perched water under the Plant 2/3 and Plant 6 areas to reach the surface water exposure points west of the production area in 1000 years through lateral migration routes, certain more mobile perched water contaminants or contaminants from source areas closer to the surface water bodies may still impact these surface water exposure points within the study time frame.

As shown in Figure F.3.3-2, the ECTran model was used to screen and simulate the lateral migration of relatively mobile CPC plumes in the major perched groundwater zone located to the west of the former production area. All the COPCs in soil and perched groundwater in this area were first subjected to a screening process of selecting CPCs in the lateral perched groundwater migration pathway. Exposure point concentrations of CPCs that can reach the selected surface water exposure points were estimated by ECTran model and used in the Operable Unit 5 baseline risk assessment.

The conceptual model used for the ECTran modeling of lateral perched groundwater migration to potential surface water exposure points is illustrated in Figure F.3.6-2. As shown, contaminated perched water (C_1) migrates through the perched water zone in glacial overburden to a surface water drainage ditch (C_2). No vertical migration of perched groundwater is considered in this conceptual model which provides the worst case scenario for the lateral migration. Chemical/geochemical information for the CPCs was collected from Section F.3.3. Because all the source areas in question were within the HELP Zone I area, the hydrogeologic parameters for Zone I were used, as shown in

Table F.3.6-1. Key hydrogeological information was determined based on measured field conditions such as perched groundwater table and hydraulic conductivity. A summary of this information is also presented in Table F.3.6-1.

F.3.6.2 Contaminant Source Areas and Expected Exposure Points

Several areas within the former production area have contaminated perched water. Much of the perched water is located in discontinuous sand lens in the glacial overburden and does not have potential to migrate laterally. However, significant perched water plumes exist within the large coarse-grained sediment lens to the west of the production area. These contaminant plumes originated from the waste pit area, silo area, Plant 2/3, Plant 8, laboratory building, and pilot plant. The locations, sizes, volumes, contaminant inventories, and representative contaminant concentrations of these plumes used in the lateral migration simulations are presented in Table F.3.6-2.

A perched water table map made using an average of several years of elevation data indicates that the general potential for fluid movement within the glacial overburden is to the west towards Paddys Run or the SSOD. The representative perched groundwater table contour map is presented in Figure F.3.6-3. The nearest surface water bodies where contaminated perched groundwater can seep out are the pilot plant drainage ditch and Paddys Run, depending on the source area. These surface water bodies are shown in Figures F.3.6-3 and F.3.6-4. Perched groundwater flowpaths from each of the source plume areas to the receptor stream, based on the measured perched groundwater table contours, are presented in Figure F.3.6-4. Other physical parameters required in the constituent screening and transport simulation for each source area are defined in Table F.3.6-1.

F.3.6.3 CPC Screening

To determine CPCs for the lateral migration pathway in perched groundwater, a four-step screening of all Operable Unit 5 COPCs was followed. The screening steps are described as follows:

- Source-area-specific critical partition coefficients based on retardation factors were determined by considering the perched groundwater flow gradient, hydraulic conductivities, and flow distance to the nearest exposure point.
- CPCs existing in a source area which have partition coefficients greater than the source-area-specific critical partition coefficients are screened out.

- Constituents with measured perched water concentrations (or calculated leachate concentrations using available soil concentrations) less than the water criteria (10^{-7} risk-based level or 0.1 HQ level) are eliminated.

- Radionuclide and organic constituents that can decay to concentrations that are below water criteria (10^{-7} risk-based level or 0.1 HQ level) before reaching the exposure point are eliminated.

The constituents that passed the above-listed screening process in at least one source area were the CPCs considered in the lateral perched groundwater migration pathway. Source-area-specific CPCs are summarized in Table F.3.6-2. Their maximum exposure point concentrations are estimated using the ECTran model as described in F.3.6.1.

F.3.7 MODELING RESULTS

As discussed in previous sections, CPCs have been categorized as either primary or secondary and different modeling approaches have been followed for each of these categories. Table F.3.7-1 shows the models that have been used for the different CPCs. The following sections describe these modeling results.

F.3.7.1 SWIFT Great Miami Aquifer Model

Effects of the Current Environmental Management Activities

Figures F.3.4-6 through F.3.4-8 show the initial concentration contours of uranium in the Great Miami Aquifer. Because uranium is the predominant groundwater COC, the predicted uranium conditions are discussed here to demonstrate the general future Great Miami Aquifer groundwater contaminants. These initial uranium plumes are combinations of field measured data and supplemental modeling characterizations for source areas in other operable units.

At the end of the baseline condition (i.e., 70 years) during which the South Groundwater Contamination Plume recovery well system and storm water runoff controls are in operation, the predicted uranium plumes in the Great Miami Aquifer are shown in Figure F.3.7-1. The current South Plume will be significantly reduced in both size and concentrations. However, even with the storm water retention basin, the surface water loading of uranium from areas around the former production area through the upper section of the SSOD still can create a significant plume in the vicinity of the SSOD.

Contaminant Breakthrough Time and Maximum Mass Loading

The breakthrough time, which is defined as the time it takes for significant contaminant concentration (e.g., a concentration higher than 1 percent of the original source leachate) to vertically migrate through the overburden from its current location and reach the Great Miami Aquifer, is information required by the Operable Unit 5 FS to prioritize the cleanup efforts. The breakthrough time is generally controlled by the area-specific infiltration rate, gray clay thickness and chemical-specific retardation factors. This discussion only applies to the migration through glacial overburden and does not include surface water loading.

As previously described, vertical migration of contaminants through overburden in every 125- by 125-foot area was determined by using the ODAST/SWIFTLOAD model to screen COPCs and determine mass loading terms into the Great Miami Aquifer models. By comparing all the area-specific loading terms, locations of the contaminant-specific maximum loading and corresponding loading curves (i.e., leachate concentrations vs. time) within each of the six baseline risk assessment zones (see Figure F.3.1-3) can be identified. These results are representative of the area-specific contaminant breakthrough times that need to be considered in the FS.

Table F.3.7-2 shows the maximum loadings from the vadose zone to the Great Miami Aquifer for each CPC and the time and risk zone of these maximum loadings. These loadings are based upon the results from the SWIFTLOAD modeling. Time and zone of maximum loadings vary for each constituent based upon source mass, initial concentration, constituent attenuation, vadose zone layer thicknesses, and vadose zone layer hydraulic properties. For several constituents, the Plant 6 and Plant 9 areas produced maximums because these areas typically have higher concentrations of constituents and because of the simulated increased hydraulic conductivity in this area (see discussion in Section F.3.4). Total uranium had the highest loading of 5.48×10^{-2} lbs/day per 125- by 125-foot area in the Plant 6 area; almost 2 orders of magnitude greater than the next highest CPC. Figure F.3.7-2 depicts the loading and the breakthrough concentration over time for uranium at the maximum loading block in the Plants 6 and 9 areas. The loading to the aquifer is negligible until around 350 years at which time it increases sharply to its maximum of 5.48×10^{-2} lbs/day at 650 years. The mass loading then decreases exponentially to a value of 3.74×10^{-2} lbs/day per 125- by 125-foot area at 1000 years.

As an example, Figures F.3.7-3 and F.3.7-4 show the zone-specific locations of the maximum loading outside of SSOD and corresponding loading curves for total uranium, respectively. The breakthrough times in the following specific source areas were also evaluated in the modeling:

- Plant 6 - about 350 years
- Plant 2/3 - about 950 years
- Sewage treatment plant - greater than 1000 years
- Plant 9 - about 1000 years
- Fire training area - greater than 1000 years.

Maximum Future Groundwater Contaminant Concentrations

For the Great Miami Aquifer, maximum concentration, location, and time of maximum are presented for the CPCs in Table F.3.7-3. The zone-specific maximums represent the maximum concentration in any model grid block considering the particular zone; the fence line maximum considers only model grid blocks located on the fence line; the on-property maximum considers only those grid blocks within the boundary. Grid maximums typically correspond to on-property maximums indicating a contaminant source located on property. Fence line maximums are less than on-property maximums due to adsorption and decay of the constituents during travel to the fence line from the on-property source. The time of maximum at the fence line differs from the on-property maximum by the travel time from the on-property source to the fence line.

There are exceptions to the above discussion due to surface water to Great Miami Aquifer loading occurring south of the site. Beryllium, which has loadings from surface water only (no on-property vadose zone loading within 1000 years), has a greater off-property maximum than on-property one.

As an example of the extent of contaminant migration, Figures F.3.7-5 and F.3.7-6 show the concentration contours for Ra-226 at 1000 years and Tc-99 at 100 years for the FEMP, respectively. Ra-226 degrades into radon which is a potentially harmful gas. Tc-99 has a low retardation factor and thus is fairly mobile in the environment, which accounts for these fairly short time frames compared to other constituents.

As shown on Table F.3.7-3, the FEMP total uranium maximum of 9063 μg/L (on property or risk Zone 5) occurs beneath the SSOD at 1000 years (i.e., the uranium concentration was increasing around the SSOD throughout the modeled time frame). Within the former production area, the maximum total uranium concentration is 2749 μg/L (Risk Zone 3) under Plant 6 at 790 years. At the

eastern fence line (E. Bound), a uranium maximum of 1263 μg/L occurs at 890 years. The overall maximum fence line uranium concentration of 1760 μg/L occurs at 260 years along the southern fence line due to loading from the SSOD. The uranium concentrations for the other receptors are less than these values, although some have values greater than 1000 μg/L. Figure F.3.7-7 shows the area-specific maximum uranium concentrations versus time.

Future Contaminant Concentrations at Specific Receptor Locations

Table F.3.7-4 presents the predicted maximum total uranium concentration and time of maximum at identified receptor locations. The time of maximum is largely dependent on receptor location, source loading from the vadose zone, and constituent attenuation in the Great Miami Aquifer. The table also presents other CPCs' concentrations at the receptor locations at the time corresponding to the maximum total uranium concentration. Both ODAST/SWIFT and ECTran models were used to predict these concentrations. The concentration at the time of uranium maximum for each receptor is reported for the other primary CPCs at the same locations to provide an estimate of total risk. It has been assumed that total risk is dictated by uranium concentrations due to the higher concentrations and typically higher risk factors than the other CPCs. Figures F.3.7-8 through F.3.7-14 show concentrations of select CPCs versus time at seven off-property receptor locations.

Extent of Future Groundwater Contamination

Figure F.3.7-15 shows the concentration contours for total uranium at 210 years (southern fence line maximum). This figure shows that less than one-half of the study area is above 20 μg/L. In addition the 1000 ppb contour covers a significant area and is off property to the south and nearly off property to the east. As exhibited by the contours, high concentrations result from loading at the SSOD.

Figure F.3.7-16 depicts the areal extent of uranium contamination at 1000 years. This figure represents the time of farthest eastern and southern extent of the 2 and 20 μg/L uranium contours within the 1000-year period. The extent of the plumes in this figure are larger than the uranium plot at 210 years (see Figure F.3.7-15) indicating that "equilibrium" has not been reached. The maximum concentration at both times are nearly identical, 9052 μg/L compared to 9063 μg/L, with the 1000-year concentration being slightly higher. These concentrations would tend to suggest that the maximum concentration has almost occurred. Figure F.3.7-17 shows the overall area that may be impacted by uranium contamination.

F.3.7.2 ECTran Model

Future CPC Concentrations at Specific Receptor Locations

Nine specific exposure points were modeled for contaminant loading due to contaminated surface soil, including one of Knollman's wells (i.e., Well 14 [K3]), Well 2071, Well 2119, Stricker's Grove Well, SOWC Wells 1 and 2, FEMP production well, FEMP property and the FEMP fence line. The maximum concentrations at these receptor locations and the corresponding times are summarized in Table F.3.7-5. The concentrations of the CPCs at the time of maximum uranium concentrations for each receptor are also summarized in Table F.3.7-5. The maximum groundwater concentrations due to contaminant loading from the surface soil occur in the Great Miami Aquifer directly under the source area (FEMP property exposure point). From this table it can be seen that the maximum concentrations for all of the CPCs at the on-property exposure point (i.e., the FEMP) exceeds the screening criteria. Alpha-chlordane, bis(2-chloroisopropyl)ether, and bromodichloromethane are above the screening criteria at the FEMP fence line. For the off-property receptors, the following CPC concentrations exceed the criteria: alpha-chlordane exceeds the criteria at Well 14 (K3); bis(2-chloroisopropyl)ether is over the criteria at the Well 2071, Well 2119, Stricker's Grove Well, and the SOWC Wells 1 and 2; bromodichloromethane is over the criteria at the Well 2119, Stricker's Grove Well, and the SOWC Wells 1 and 2.

The maximum groundwater concentrations due to contaminant loading from surface water occur in the Great Miami Aquifer directly under the source area (i.e., FEMP property). These ECTran modeling results for all CPCs which load from surface water are summarized in Table F.3.7-6. From Table F.3.7-6 it can be seen that the maximum concentrations for all radionuclide, organic, and inorganic CPCs exceed the 10^{-7} risk-based (or HQ=0.1) screening criteria. Five specific exposure points were modeled for contaminant loading due to surface water and they include the Knollman's wells (i.e., Well 12 [K1], Well 13 [K2], and Well 14 [K3], respectively), the FEMP property and the FEMP fence line near Well 14 (K3). The FEMP fence line was not used as an exposure point for Wells 12 and 13 because of the proximity of the wells to the fence line. The maximum concentrations at these exposure points and the corresponding times are also summarized in Tables F.3.7-6. In addition, the concentrations of the contaminants at the exposure point for the time of the maximum U-238 concentration are included in these tables. From the table it can be seen that the uranium isotopes and many of the inorganics and organics concentrations exceed the criteria at most of the receptors.

Future Contaminant Concentrations at Surface Water Exposure Points

Table F.3.7-7 summarizes the ECTran modeling results for the lateral perched groundwater migration. The predicted maximum concentrations and occurring times of CPCs that will reach the pilot plant drainage ditch and Paddys Run are presented in the table. Also included in the table is the estimated mass loading rate from the perched water to the surface water.

From the table it can be seen that all radionuclide concentrations at the surface water receptor are below the 10^{-7} risk criteria except for Tc-99 from the Operable Unit 1 "A" and Operable Unit 4 source areas. For inorganics only cyanide from the laboratory source area exceeds the 10^{-7} criteria. As for organic CPCs, 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, and trichloroethene exceed the 10^{-7} criteria by generally less than 1 order of magnitude at the surface water receptor due to the Operable Unit 4 source area.

From the modeling results the impact of perched water seeping into the surface water can be evaluated by comparing the surface water concentration (that the seepage from the contaminated perched water would create in Paddys Run) with screening levels (i.e., 10^{-7} risk criteria for carcinogens or the 0.1 HQ for noncarcinogens). If the predicted maximum surface water concentration is below the screening level, the contribution of the perched water to the surface water is considered insignificant and the constituent is screened out. To calculate the loading concentrations, the predicted mass loading rates from the perched water to the surface water, presented in Table F.3.7-7, are mixed with the total flow of water from the perched water zone and the baseflow in Paddys Run. The base flow in Paddys Run was estimated to range from 0.2 cfs to 4 cfs (Dames and Moore 1985). The minimum baseflow is used in calculating the concentration as a conservative assumption. The total flow of perched water is calculated based on the gradient of the average groundwater elevation contours of the Type 1 monitoring wells, lengths of the seepage faces along the pilot plant drainage ditch and Paddys Run, and the perched water zone thickness. Table F.3.7-8 summarizes the screening results. Based on this screening, none of the constituents loading to the surface water from the perched water have a significant impact on the surface water.

F.3.8 MODEL PERFORMANCE EVALUATION

The performance of the model was evaluated to check the veracity of the model. The performance evaluation consisted of three primary activities:

- Forty-year model simulation results were compared to monitoring data.
- The Great Miami Aquifer solute transport model was calibrated for uranium in the South Plume area to determine values of K_d and dispersivity.
- Sensitivity analysis was performed to understand the effect of changing model transport parameters on the risk assessment performance measures.

These activities were performed as part of the Operable Units 1, 2, and 4 RIs and as part of the model improvement program. The following sections summarize these results.

F.3.8.1 Verification of Aquifer Loadings in Operable Units 1, 2, and 4 RI Modeling

During the modeling performed for Operable Units 1, 2 and 4, monitoring data from wells collected in the vicinity of the applicable waste areas were reviewed and compared to initial modeling simulations of 40 years. Based on this comparison, transport parameters were changed to calibrate the loading to Great Miami Aquifer conditions at 40 years. Forty years was used because FEMP operations began in the early 1950s and contaminant loading is assumed to have continued to the present day. These calibration efforts are described in the applicable Operable Unit RI reports fate and transport modeling appendices.

When the solute transport calibration was performed for uranium, these calibrated transport parameters and source loading terms were used (see discussion below). Supplemental modeling characterization conducted in Operable Unit 5 also used these parameters and loading terms in the improved SWIFT Great Miami Aquifer model to establish the current conditions in the Great Miami Aquifer under other operable units.

F.3.8.2 Solute Transport Calibration

The solute transport model was recalibrated to obtain more accurate transport parameters, especially K_d and dispersivity. The calibration effort is part of the Model Improvement Program (see DOE 1993b) and the detailed approach and calibration criteria are defined in the Model Calibration Technical Objective/Technical Approach (DOE 1993d). The results of the calibration effort are described in the Summary of Model Improvements Report (DOE 1994e).

Since the original solute transport calibration by IT in 1989 and 1990 (DOE 1993a), additional data have been collected and new monitoring wells have been installed and sampled. These data showed

that the southern extent of the South Plume did not extend as far south as was believed during the original calibration. The original calibration, using an estimated retardation factor of 9, resulted in a reasonable match to the monitoring data (except for the southern extent of the South Plume as described above) with most of the contamination in the shallower model layers. Based on the results of a geochemical study (DOE 1993a), the retardation factor was revised upward to 12. The calibration using the retardation of 12 resulted in more uranium modeled at depth (which does not match new monitoring data) and a much larger historical mass loading to the aquifer. The geochemical study miscalculated the retardation factor by using a grain density instead of a bulk density in the retardation equation. In fact, geochemical studies indicate a range of retardation factors from approximately 8 to 33, indicating that the original calibration with a retardation factor equal to 9 was within the range. Further calibration efforts were performed to consider these factors.

Results

After the flow model was successfully recalibrated, its impact on the solute transport model was evaluated. This model recalibration consisted of the following steps:

1) Uranium dissolved mass was calculated based upon geostatistical analysis of 1990 uranium sampling data (selected as representative of the present plume) from Great Miami Aquifer monitoring wells. For both the R_d equal to 9 and 12 cases, uranium solid mass was calculated based upon the dissolved mass and K_d.

2) For the two R_d cases, uranium loading terms to the Great Miami Aquifer in the original model were scaled based upon the total mass calculated as presently being in the Great Miami Aquifer. By doing this, the total mass loaded into the aquifer equaled what was presently in the aquifer.

3) With the revised loading terms, the former R_d equal to 9 and 12 solute transport calibration cases were run on the revised flow model. The R_d equal to 12 case was selected as being more representative. However, a comparison with established calibration criteria showed that recalibration was needed.

4) Runs were performed varying lateral (vertical) dispersivity in order to distribute the mass between the layers in a similar manner to the geostatistical results. It was found that a lateral dispersivity of 0.1-foot resulted in a distribution of mass in the six model layers comparable to the geostatistical results.

5) The loading terms were fine tuned to create a better match to the calibration criteria. Portions of mass loading were relocated from Paddys Run to the SSOD. In addition, loading terms were corrected in the vicinity of Operable Units 1 and 2 waste areas based upon the specific fate and transport modeling (including calibration of source terms) in those areas.

6) The final results were compared to the calibration criteria and were found to satisfy these criteria.

F.3.8.3 Uncertainty/Sensitivity Analysis of the Great Miami Aquifer Model

Uncertainty/sensitivity analysis of the Great Miami Aquifer model used in the Operable Unit 5 RI is conducted as part of the model improvement program (DOE 1994e). The objective of this uncertainty analysis is to quantify the uncertainty of the output from the improved Great Miami Aquifer groundwater flow and transport model. For this evaluation, model uncertainty analysis is focused upon the definition of the statistical distribution of specific performance measures used in risk assessments. These performance measures include the maximum concentration anywhere in the aquifer and maximum concentration and travel time to a receptor (e.g., the property line).

The ECTran and SWIFT Great Miami Aquifer models are used in a complementary fashion to perform this uncertainty analysis. ECTran is used to perform Monte Carlo analysis using defined ranges of input values of several model parameters. However, because certain simplifications are necessary when using the analytical ECTran model, SWIFT simulations are performed to confirm the ECTran results with the more sophisticated, 3-dimensional, numeric model that is actually used in the risk assessments.

The following three activities are conducted for the uncertainty/sensitivity analysis:

- Parameter Estimation - Site and literature data are reviewed to estimate reasonable ranges of the selected model input parameters. Distributions are established for input parameters including horizontal hydraulic conductivity (K_h), horizontal to vertical hydraulic conductivity ratio (K_h/K_v), hydraulic gradient (I), porosity (n), uranium partition coefficient (K_d), dispersivity (α), mixing depth (d_m), and travel distance to a receptor (L). The range of input parameter values is established by compiling site-specific data or literature values. Table F.3.8-1 shows the selected values and distributions of these model input parameters.

- ECTran Simulations - Using the estimated ranges and distributions defined in the parameter estimation task, Monte Carlo simulations are performed using the ECTran model to provide an analysis of uncertainty of the performance measures. These simulations include input distributions of K_h, K_d, α, I, n, d_m, and L. The ECTran Monte Carlo simulations are used to statistically quantify the combined impacts of uncertainties of all the major model parameters on exposure concentrations and time of travel.

  Table F.3.8-2 shows the ECTran results. The ECTran results demonstrate that, while there was a wide range of possible results (up to 6 orders of magnitude using the Monte Carlo technique), the majority (55 to 80 percent) of the concentration values

000988

were lower than the baseline case. Actually, there is only four to six times variation between the baseline case and the extreme maximum. Monte Carlo simulations also indicate the relative sensitivities of the performance measures to different model parameters.

- SWIFT Sensitivity Analysis - Sensitivity analysis with the improved SWIFT groundwater model is performed to confirm the results of the ECTran modeling, to include the effect of K_h/K_v (which ECTran is unable to assess), and to assess the impact in a 3-dimensional context. The SWIFT model sensitivity analyses focus on quantifying the ranges of model outputs based on the extreme values of individual or combined model parameters to which the exposure concentrations or contaminant travel times are most sensitive. Table F.3.8-3 shows the parameter values used in these simulations.

  The SWIFT sensitivity results are shown in Tables F.3.8-4 and F.3.8-5. The SWIFT sensitivity results, following a simple band approach, show the grid maximum concentration varying from 22 to 220 percent of the baseline case. For the fence line maximum, the variation was tempered somewhat from 28 to 143 percent. These fenceline maximums occur at the southern property boundary and were caused by the hypothetical South Field loading. The eastern property line has time of maximums from 100 to 280 years. Maximum concentrations at the property line compared to the baseline case vary from 42 to 141 percent. For the grid concentration maximum, the most sensitive parameters are hydraulic conductivity and dispersivity, while for the property line maximum concentration the most sensitive parameters are partition coefficient and dispersivity. The baseline model output is reasonably conservative with the calibrated results closer to the maximum case rather than the minimum case.

  A simulation with the original calibrated model (before improvements) is performed which results in lower grid and fenceline maximum concentrations by factors of 3 and 2, respectively, than the revised model. Greater and apparently unrealistic concentrations of contaminant have reached the lower layers in the original model showing the positive results of the model improvements.

Both the ECTran and SWIFT simulation results show that, while the model will produce a reasonably wide range of output based on ranges of input parameters, nevertheless the baseline model output is within an order of magnitude of the maximum cases based upon both the ECTran Monte Carlo and SWIFT sensitivity results. The ECTran results show possible higher concentration values by four to six times than the baseline case. SWIFT results indicate a tighter range of concentrations; typically less than a factor of 2.5 for the maximum grid concentration and 2 for the fence line maximum. Since other portions of risk assessments typically contain several orders of magnitude of uncertainty, the uncertainty attributable to the Great Miami Aquifer model is relatively minor. Based on a comparison with the original model, the revised SWIFT Great Miami Aquifer model presents a more conservative depiction of on-property and property-line predicted concentrations than the original model. The improved model predicts a moderately conservative but realistic depiction of plume

transport based on the estimated ranges of model input. Additional information on this sensitivity/ uncertainty analysis is presented in the Summary of Model Improvement Report (DOE 1994e).

F.3.8.4 Uncertainty Analysis of Uranium K_l and K_d

Uranium K_l and K_d Values

Uncertainty/sensitivity analysis for the Great Miami Aquifer model described in the previous subsection did not consider uncertainties associated with contaminant source-loading terms (i.e., source leachate concentration and mobility of uranium in the overburden). During the uncertainty/ sensitivity analysis, contaminant source-loading terms or initial plumes in the Great Miami Aquifer were fixed in order to focus the analysis on the Great Miami Aquifer model parameters only. However, the source-loading term is expected to be the most important factor for determining future impacts to the Great Miami Aquifer. Therefore, an uncertainty analysis was conducted for the uranium source-loading term. As discussed in Attachment F.3.I, based on available geochemical information, the baseline geochemical conditions shown in Figure F.3.4-2 was suggested as a reasonable representation of the conditions existing at the FEMP. Nevertheless, because of the limited geochemical data available in the depleted source areas (i.e., areas outside the former production area), uncertainties of the assumed conditions need to be evaluated. The objective of this uncertainty analysis is to define the upper bound of potential impacts to the Great Miami Aquifer. Unlike the sensitivity analysis, therefore, if a parameter had already been assigned a very conservative value in the baseline case, it was not adjusted in this analysis.

The source-loading term to the Great Miami Aquifer from soil contamination is most sensitive to current source concentration, leaching (i.e., K_l) and partitioning coefficients (i.e., K_d) among all the relevant model parameters. Because the source concentration was determined through a very rigorous statistical analysis protocol, it is usually very conservative. Similarly for the areas shown in Figure F.3.4-2 where uranium contamination was determined to be soluble and a lower representative value (i.e., 15 L/kg) was assigned to both the K_l for source leachate determination and the K_d for underlying gray clay, the source-loading terms are very conservative. Therefore, all the solid-phase source concentrations and areas with soluble uranium remain the same as in the baseline conditions for this uncertainty analysis. Only K_l and K_d in areas where these two parameters originally had the same value of 222 L/kg in the baseline case were adjusted and evaluated. Soluble uranium in these areas as assumed to be depleted and therefore a higher K_d value was assigned in the baseline

condition. The higher K_d value represents the desorption-dominated condition as discussed in Attachment F.3.I.

For this uncertainty analysis, ODAST/SWIFTLOAD and SWIFT Great Miami Aquifer models were used to simulate the uranium loading from areas where the K_l and K_d were adjusted (i.e., areas with depleted sources). In general, these areas are located to the north, east, and south of the former production area as shown in Figure F.3.4-2. The following two sets of adjustments were first made in the initial analysis:

- Case 1 - Use 25 percent of the original source concentrations with both K_l and K_d equal to 15 L/kg
- Case 2 - Use 100 percent of the original source concentrations with K_l of 222 L/kg and K_d of 15 L/kg.

309 Case 1 was designed to bound the impact due to uncertainty of the baseline assumption that all uranium contaminations currently in these areas are less soluble (i.e., depleted sources). It was assumed that 25 percent of the current uranium contamination is soluble and mobile (i.e., with a lower value of K_l or K_d). Case 2 studied the uncertainty regarding the mobility of uranium leachate in the overburden from these areas. This case assumed that all the uranium in soil leachate is mobile (i.e., with K_d of 15 L/kg) even when the source is depleted and less soluble (i.e., with K_l of 222 L/kg). These same areas were also simulated separately from all the other source areas with the baseline conditions (i.e., 100 percent of source concentrations with both K_l and K_d equal to 222 L/kg), for comparison with the results of Cases 1 and 2. This simulation indicated that no additional uranium will reach the Great Miami Aquifer in 1000 years from the depleted source areas through vertical migration with a K_d value of 222 L/kg.

Simulated uranium concentrations at receptor locations from Cases 1 and 2 are summarized in Table F.3.8-6. The uranium plumes with the maximum uranium concentrations for these two cases are also shown in Figures F.3.8-1 and F.3.8-2. Because the baseline case did not have loading to the Great Miami Aquifer from the areas evaluated in the uncertainty analysis, results of the Case 1 and 2 simulations can be directly superimposed on the overall results of the baseline conditions for defining upper bounds of potential impacts to the Great Miami Aquifer during the baseline risk assessment. However, a simulation which used the baseline source conditions (i.e., source concentrations and values of K_l as shown in Figure F.3.4-2) for the whole model area, but with a uniform K_d value of

15 L/kg in the gray clay, was conducted. This complete simulation was designated as Case 3 in this uncertainty analysis. The Case 3 simulation provided the same effects as combining the Case 2 and baseline results. The resulting receptor concentrations of this case are summarized in Table F.3.8-7. The uranium plumes with the maximum on-property and fence line concentrations for Case 3 are also shown in Figures F.3.8-3 and F.3.8-4.

The three cases studied in this uncertainty analysis provide information regarding the potential ranges of uranium concentrations at receptor locations. The Operable Unit 5 baseline risk assessment evaluates the results of this uncertainty analysis when determining potential future impacts due to migration of uranium contamination. It is also expected that additional geochemical data from the depleted source areas will be available for the Operable Unit 5 FS to evaluate and select remedial alternatives.

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TABLE F.3.4-1

OPERABLE UNIT 5 DETECTED CONSTITUENTS

Radiological

Actinium-227
Cesium-137
Lead-210
Neptunium-237
Plutonium-238
Plutonium-239/240
Polonium-210
Protactiunium-231
Radium-224
Radium-226
Radium-228
Ruthenium-106
Strontium-90
Technetium-99
Thorium-228
Thorium-230
Thorium-232
Uranium-234
Uranium-235/236
Uranium-238
Uranium-Total

Organics

1,1-Dichloroethane
1,1-Dichloroethene
1,1,1-Trichloroethane
1,1,1-Trichloroethene
1,2-Dichloroethane
1,2-Dichloroethene (total)
2-Butanone
2-Chlorophenol
2-Hexanone
2-Methylphenol
2-Methylnaphthalene
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
3,3-Dichlorobenzidine
4-Chloro-3-methylphenol
4-Methyl-2-pentanone
4-Methylphenol
4-Nitroaniline

Organics (Cont)

4-Nitrophenol
4,4-DDE
4,4-DDT
Acenaphthene
Acenaphthylene
Acetone
Aldrin
Alpha-chlordane
Anthracene
Aroclor-1254
Aroclor-1260
Benzene
Benzo(A)anthracene
Benzo(A)pyrene
Benzo(B)fluoranthene
Benzo(G,H,I)perylene
Benzo(K)fluoranthene
Benzoic Acid
Benzyl alcohol
Beta-BHC
Bis(2-chloroisopropyl)ether
Bis(2-Ethylhexyl)phthalate
Bromodichloromethane
Bromomethane
Butylbenzylphthalate
Carbazole
Carbon disulfide
Chlorobenzene
Chloroform
Chrysene
Di-n-butylphthalate
Di-n-octylphthalate
Dibenzo(A,H)anthracene
Dibenzofuran
Diethylphthalate
Endosulfan II
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Ethylbenzene
Fluoranthene
Fluorene

TABLE F.3.4-1
(Continued)

Organics (Cont)	Inorganics
Heptachlor Epoxide	Aluminum
Heptachlorodibenzofurans	Antimony
Hexachlorobutadiene	Arsenic
Indeno(1,2,3-CD)pyrene	Barium
Isophorone	Beryllium
Methoxychlor	Boron
Methylene Chloride	Cadmium
N-nitroso-di-n-propylamine	Calcium
N-nitrosodiphenylamine	Chromium
Napthalene	Cobalt
Octachlorodibenzo-p-dioxin	Copper
Phenanthrene	Cyanide
Phenol	Iron
Pyrene	Lead
Styrene	Magnesium
Tetrachloroethene	Mercury
Toluene	Molybdenum
Tributylphosphate	Nickel
Trichloroethene	Potassium[a]
Xylenes, total	Selenium
	Silicon[a]
	Silver
	Sodium[a]
	Thallium
	Vanadium
	Zinc

[a]Constituent not modeled due to low toxicity

TABLE F.3.4-2

GENERAL PHYSICAL AND CHEMICAL CONDITION OF CONCEPTUAL OPERABLE UNIT 5 CONTAMINANT SOURCE AREAS

Area[a]	Size (ft^2)	Contaminated Depth (ft)	Dry Bulk Density (g/cm^3)	Level of Contamination	Type of Contamination[b]	Fraction of Organic Content (%)[c]	Ground Coverage Type
Areas surrounding the FEMP to the north, east, and south	3.03×10^7	1.5	1.44	Low	R,O	1	Grass
Area between production area and Paddys Run	5.91×10^6	1.5	1.37	Low	R,I,O	1	Grass
Area of higher contamination near pilot plant drainage ditch	8.08×10^5	1.5	1.34	Medium	R	1	Grass
Area in the immediate vicinity of the production area	5.77×10^6	1.5	1.46	Medium	R,I,O	1	Pavement/ Building
Plant 1 drum storage area	6.41×10^5	1.5	1.41	High	R,I,O	1	Bare ground/ Grass
Solid waste landfill[d]	5.57×10^4	1.5	1.45	High	R,I,O	1	Grass
South Field/Inactive flyash pile[d]	5.58×10^5	1.5	1.36	High	R,I,O	1	Grass
Sewage treatment plant	1.39×10^5	1.5	1.48	High	R,I,O	1	Building
Downstream of active flyash pile	1.39×10^5	1.5	1.41	Medium	R,I	1	Woods
Active flyash pile[d]	8.36×10^4	1.5	1.41	High	R,I	1	Bare ground
Scrap metal pile, graphite furnace, and oil burner	1.25×10^6	1.5	1.40	High	R,I,O	1	Building
Plant 2/3 area	3.90×10^5	20.0	1.40	High	R,O	1	Building

TABLE F.3.4-2 (Continued)

Area[a]	Size (ft^2)	Contaminated Depth (ft)	Dry Bulk Density (g/cm^3)	Level of Contamination	Type of Contamination[b]	Fraction of Organic Content (%)[c]	Ground Coverage Type
Plant 4 area	2.23×10^5	11.0	1.40	High	R,I,O	1	Building
Plant 6 and Plant 9 areas	6.13×10^5	16.0	1.40	High	R,I,O	1	Building
Clearwell pipeline area	4.96×10^5	1.5	1.40	High	R,O	1	Building
Laboratory area	2.51×10^5	1.5	1.40	High	R,I,O	1	Building
Lime sludge ponds[d]	8.36×10^4	1.5	1.40	High	R,I,O	1	Grass
Remaining production area	2.20×10^6	1.5	1.40	High	R,I,O	1	Pavement/ Building
Waste pit area[d]	1.03×10^6	1.5	1.45	High	R,I,O	1	Grass
Silo area[d]	1.67×10^5	1.5	1.45	High	R,I,O	1	Grass
K-65/Clearwell pipeline area	5.02×10^5	1.5	1.33	Medium	R,I	1	Grass
Portion of FEMP draining directly to east	1.37×10^6	1.5	1.45	Low	R,I	1	Woods/Grass

[a] See Figure 5-8
[b] R-Radionuclide
I-Inorganic
O-Organic
[c] See Section F.2.3.2 for a discussion of the determination of foc values.
[d] Areas which are included in other operable units at the FEMP. The actual contaminant loadings determined in previous RI reports for these areas were used directly in the Operable Unit 5 groundwater modeling to determine their impacts to date.

TABLE F.3.4-3

SOURCE CONCENTRATIONS AND INVENTORIES IN THE GROUNDWATER PATHWAY VERTICAL MIGRATION

Constituent of Potential Concern	Total Contaminated Area (ft^2)	Range of Source Concentration (mg/kg)		Mass of Contaminated Soil (kg)	Mass of Constituents in Soil (kg)
		Minimum	Maximum		
Radionuclides					
Neptunium-237	$1.29 \times 10^{+07}$	2.94×10^{-04}	3.73×10^{-03}	$2.21 \times 10^{+09}$	$3.64 \times 10^{+00}$
Radium-226	$3.72 \times 10^{+07}$	3.03×10^{-07}	2.98×10^{-03}	$4.60 \times 10^{+09}$	1.79×10^{-01}
Strontium-90	$3.72 \times 10^{+07}$	3.10×10^{-09}	4.74×10^{-08}	$4.60 \times 10^{+09}$	8.25×10^{-05}
Technetium-99	$2.81 \times 10^{+07}$	6.47×10^{-05}	1.34×10^{-02}	$3.76 \times 10^{+09}$	$2.01 \times 10^{+00}$
Uranium-Total	$3.72 \times 10^{+07}$	$1.15 \times 10^{+01}$	$4.31 \times 10^{+04}$	$4.60 \times 10^{+09}$	$2.80 \times 10^{+06}$
Inorganics					
Antimony	$3.72 \times 10^{+07}$	7.60×10^{-01}	$3.81 \times 10^{+01}$	$4.60 \times 10^{+09}$	$4.20 \times 10^{+04}$
Arsenic	$3.72 \times 10^{+07}$	$3.30 \times 10^{+00}$	$3.25 \times 10^{+01}$	$4.60 \times 10^{+09}$	$4.27 \times 10^{+04}$
Barium	$3.72 \times 10^{+07}$	$6.38 \times 10^{+01}$	$5.12 \times 10^{+02}$	$4.60 \times 10^{+09}$	$5.94 \times 10^{+05}$
Boron	$3.72 \times 10^{+07}$	$1.37 \times 10^{+01}$	$1.43 \times 10^{+01}$	$4.60 \times 10^{+09}$	$6.40 \times 10^{+04}$
Chromium (hex)	$3.72 \times 10^{+07}$	9.80×10^{-01}	$4.69 \times 10^{+00}$	$4.60 \times 10^{+09}$	$2.31 \times 10^{+03}$
Cyanide	$3.72 \times 10^{+07}$	1.10×10^{-01}	$8.60 \times 10^{+00}$	$4.60 \times 10^{+09}$	$4.23 \times 10^{+03}$
Magnesium	$3.72 \times 10^{+07}$	$1.20 \times 10^{+03}$	$4.86 \times 10^{+04}$	$4.60 \times 10^{+09}$	$1.27 \times 10^{+08}$
Manganese	$3.72 \times 10^{+07}$	$4.43 \times 10^{+02}$	$3.42 \times 10^{+03}$	$4.60 \times 10^{+09}$	$5.92 \times 10^{+06}$
Mercury	$3.72 \times 10^{+07}$	2.00×10^{-02}	$1.30 \times 10^{+00}$	$4.60 \times 10^{+09}$	$1.91 \times 10^{+03}$
Molybdenum	$3.72 \times 10^{+07}$	8.30×10^{-01}	$1.28 \times 10^{+01}$	$4.60 \times 10^{+09}$	$2.74 \times 10^{+04}$
Thallium	$3.72 \times 10^{+07}$	2.20×10^{-01}	7.70×10^{-01}	$4.60 \times 10^{+09}$	$2.30 \times 10^{+03}$
Organics					
1,1-Dichloroethene	$1.03 \times 10^{+07}$	2.00×10^{-03}	3.90×10^{-02}	$2.10 \times 10^{+09}$	$1.45 \times 10^{+01}$
1,1,1-Trichloroethane	$1.38 \times 10^{+07}$	1.00×10^{-03}	1.20×10^{-01}	$2.42 \times 10^{+09}$	$7.31 \times 10^{+01}$
1,1,2-Trichloroethane	$8.44 \times 10^{+05}$	2.00×10^{-03}	1.40×10^{-02}	$7.66 \times 10^{+08}$	$3.43 \times 10^{+00}$
1,1-Dichloroethane	$1.16 \times 10^{+07}$	1.00×10^{-03}	3.70×10^{-02}	$2.22 \times 10^{+09}$	$2.01 \times 10^{+01}$
1,2-Dichloroethane	$2.18 \times 10^{+06}$	2.00×10^{-03}	6.00×10^{-03}	$8.90 \times 10^{+08}$	$4.21 \times 10^{+00}$
1,2-Dichloroethene (Total)	$2.43 \times 10^{+06}$	4.00×10^{-03}	3.40×10^{-01}	$9.14 \times 10^{+08}$	$6.69 \times 10^{+01}$
2-Chlorophenol	$1.93 \times 10^{+06}$	4.80×10^{-02}	4.80×10^{-02}	$1.79 \times 10^{+08}$	$8.61 \times 10^{+00}$
2-Hexanone	$9.88 \times 10^{+06}$	1.00×10^{-03}	2.00×10^{-03}	$1.61 \times 10^{+09}$	$2.45 \times 10^{+00}$
2-Methylnaphthalene	$1.01 \times 10^{+07}$	2.50×10^{-02}	$1.30 \times 10^{+00}$	$1.63 \times 10^{+09}$	$4.81 \times 10^{+02}$
2-Methylphenol	$1.33 \times 10^{+06}$	4.50×10^{-02}	4.50×10^{-02}	$1.24 \times 10^{+08}$	2.91×10^{-11}
Organics (Continued)					
2,4-Dinitrotoluene	$1.33 \times 10^{+06}$	5.30×10^{-02}	5.30×10^{-02}	$1.24 \times 10^{+08}$	3.43×10^{-11}
2,6-Dinitrotoluene	$2.32 \times 10^{+05}$	1.10×10^{-02}	1.10×10^{-02}	$1.58 \times 10^{+08}$	8.79×10^{-13}

TABLE F.3.4-3
(Continued)

Constituent of Potential Concern	Total Contaminated Area (ft^2)	Range of Source Concentration (mg/kg)		Mass of Contaminated Soil (kg)	Mass of Constituents in Soil (kg)
		Minimum	Maximum		
4-Chloro-3-Methylphenol	$2.54 \times 10^{+06}$	4.60×10^{-02}	8.80×10^{-02}	$7.87 \times 10^{+08}$	$8.26 \times 10^{+00}$
4-Methylphenol	$4.87 \times 10^{+06}$	5.00×10^{-02}	$1.70 \times 10^{+00}$	$4.53 \times 10^{+08}$	8.26×10^{-01}
4-Nitroaniline	$1.93 \times 10^{+06}$	3.30×10^{-01}	3.30×10^{-01}	$1.79 \times 10^{+08}$	$5.92 \times 10^{+01}$
Alpha-Chlordane	$1.46 \times 10^{+06}$	2.80×10^{-03}	5.10×10^{-03}	$1.36 \times 10^{+08}$	4.93×10^{-01}
Benzene	$1.01 \times 10^{+07}$	1.00×10^{-03}	6.67×10^{-02}	$1.63 \times 10^{+09}$	$4.32 \times 10^{+01}$
Benzyl Alcohol	$3.26 \times 10^{+06}$	6.90×10^{-02}	2.90×10^{-01}	$3.03 \times 10^{+08}$	$1.24 \times 10^{+01}$
Bis(2-Chloroisopropyl) Ether	$2.05 \times 10^{+06}$	4.40×10^{-02}	4.80×10^{-02}	$1.91 \times 10^{+08}$	$2.94 \times 10^{+00}$
Bromodichloromethane	$2.19 \times 10^{+06}$	6.00×10^{-03}	7.00×10^{-03}	$7.54 \times 10^{+08}$	8.79×10^{-01}
Carbazole	$1.04 \times 10^{+07}$	7.00×10^{-03}	2.50×10^{-01}	$1.98 \times 10^{+09}$	$1.28 \times 10^{+02}$
Diethylphthalate	$3.43 \times 10^{+06}$	1.00×10^{-03}	5.20×10^{-02}	$4.56 \times 10^{+08}$	$1.01 \times 10^{+01}$
Endosulfan II	$5.27 \times 10^{+05}$	2.00×10^{-03}	2.00×10^{-03}	$4.90 \times 10^{+07}$	5.17×10^{-13}
Endosulfan Sulfate	$5.27 \times 10^{+05}$	7.30×10^{-04}	7.30×10^{-04}	$4.90 \times 10^{+07}$	1.89×10^{-13}
Endrin Aldehyde	$1.93 \times 10^{+06}$	1.50×10^{-02}	1.50×10^{-02}	$1.79 \times 10^{+08}$	$2.69 \times 10^{+00}$
Heptachlor Epoxide	$1.46 \times 10^{+06}$	1.00×10^{-03}	2.80×10^{-03}	$1.36 \times 10^{+08}$	2.92×10^{-01}
N-Nitroso-Di-N-Propylamine	$1.93 \times 10^{+06}$	3.90×10^{-02}	3.90×10^{-02}	$1.79 \times 10^{+08}$	$7.00 \times 10^{+00}$
Tetrachloroethene	$2.06 \times 10^{+07}$	1.00×10^{-03}	$1.60 \times 10^{+00}$	$3.06 \times 10^{+09}$	$2.80 \times 10^{+02}$
Trichloroethene	$1.49 \times 10^{+07}$	2.00×10^{-03}	$8.90 \times 10^{+01}$	$2.07 \times 10^{+09}$	$1.43 \times 10^{+04}$

TABLE F.3.4-4

FATE AND TRANSPORT PARAMETERS OF CONSTITUENTS CONSIDERED IN MODELING

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Radionuclides						
Actinium-227	$2.40 \times 10^{+3}$	$4.50 \times 10^{+2}$	$2.63 \times 10^{+4}$	$4.09 \times 10^{+3}$	8.72×10^{-5}	2.48×10^{-10}
Cesium-137	$1.81 \times 10^{+3}$	$1.37 \times 10^{+3}$	$1.98 \times 10^{+4}$	$1.25 \times 10^{+4}$	6.29×10^{-5}	1.965×10^{-12}
Lead-210	$3.00 \times 10^{+3}$	$3.80 \times 10^{+1}$	$3.29 \times 10^{+4}$	$3.47 \times 10^{+2}$	8.53×10^{-5}	1.217×10^{-13}
Neptunium-237	$5.50 \times 10^{+1}$	$5.00 \times 10^{+0}$	$6.03 \times 10^{+2}$	$4.65 \times 10^{+1}$	8.87×10^{-10}	3.121×10^{-8}
Plutonium-238	$1.70 \times 10^{+3}$	$1.00 \times 10^{+2}$	$1.86 \times 10^{+4}$	$9.10 \times 10^{+2}$	2.16×10^{-5}	1.287×10^{-12}
Plutonium-239/240	$1.70 \times 10^{+3}$	$1.00 \times 10^{+2}$	$1.86 \times 10^{+4}$	$9.10 \times 10^{+2}$	7.87×10^{-8}	3.382×10^{-10}
Polonium-210	$3.00 \times 10^{+3}$	$1.50 \times 10^{+2}$	$3.29 \times 10^{+4}$	$1.36 \times 10^{+3}$	5.01×10^{-3}	1.000×10^{-3}
Protactinium-231	$2.70 \times 10^{+3}$	$5.50 \times 10^{+2}$	$2.96 \times 10^{+4}$	$5.00 \times 10^{+3}$	5.81×10^{-8}	1.102×10^{-9}
Radium-224	$6.96 \times 10^{+2}$	$1.06 \times 10^{+2}$	$7.62 \times 10^{+3}$	$9.65 \times 10^{+2}$	1.92×10^{-1}	8.176×10^{-16}
Radium-226	$6.96 \times 10^{+2}$	$1.06 \times 10^{+2}$	$7.62 \times 10^{+3}$	$9.65 \times 10^{+2}$	1.19×10^{-6}	4.044×10^{-11}
Radium-228	$6.96 \times 10^{+2}$	$1.06 \times 10^{+2}$	$7.62 \times 10^{+3}$	$9.65 \times 10^{+2}$	3.30×10^{-4}	1.765×10^{-13}
Ruthenium-106	$8.00 \times 10^{+2}$	$5.50 \times 10^{+1}$	$8.76 \times 10^{+3}$	$5.01 \times 10^{+2}$	$1.89 \times 10^{+3}$	1.488×10^{-13}
Strontium-90	$1.00 \times 10^{+1}$	$2.50 \times 10^{+0}$	$1.11 \times 10^{+2}$	$2.37 \times 10^{+1}$	6.64×10^{-5}	1.022×10^{-12}
Technetium-99	1.18×10^{-1}	7.00×10^{-2}	$2.29 \times 10^{+0}$	$1.64 \times 10^{+0}$	8.92×10^{-9}	2.176×10^{-7}
Thorium-228	$5.80 \times 10^{+3}$	$3.20 \times 10^{+3}$	$6.35 \times 10^{+4}$	$2.91 \times 10^{+4}$	9.93×10^{-4}	5.244×10^{-13}

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Thorium-230	$5.80 \times 10^{+3}$	$3.20 \times 10^{+3}$	$6.35 \times 10^{+4}$	$2.91 \times 10^{+4}$	2.47×10^{-8}	1.796×10^{-8}
Thorium-232	$5.80 \times 10^{+3}$	$3.20 \times 10^{+3}$	$6.35 \times 10^{+4}$	$2.91 \times 10^{+4}$	1.36×10^{-13}	3.636×10^{-3}
Uranium-Total[e]	$1.50 \times 10^{+1}$	$1.78 \times 10^{+0}$	$1.65 \times 10^{+2}$	$1.72 \times 10^{+1}$	4.25×10^{-13}	8.929×10^{-4}
Organics						
1,1-Dichloroethane	3.42×10^{-1}	6.45×10^{-2}	$4.75 \times 10^{+0}$	$1.59 \times 10^{+0}$	1.13×10^{-3}	9.700×10^{-2}
1,1-Dichloroethene	1.67×10^{-1}	3.16×10^{-2}	$2.83 \times 10^{+0}$	$1.29 \times 10^{+0}$	3.85×10^{-3}	6.700×10^{-6}
1,1,1-Trichloroethane	$1.64 \times 10^{+0}$	3.09×10^{-1}	$1.89 \times 10^{+1}$	$3.81 \times 10^{+0}$	6.30×10^{-4}	1.510×10^{-1}
1,1,2-Trichloroethane	$1.64 \times 10^{+0}$	3.09×10^{-1}	$1.89 \times 10^{+1}$	$3.81 \times 10^{+0}$	4.70×10^{-4}	3.200×10^{-5}
1,1,2,2-Tetrachloroethane	$1.36 \times 10^{+0}$	2.57×10^{-1}	$1.59 \times 10^{+1}$	$3.34 \times 10^{+0}$	3.79×10^{-3}	9.000×10^{-6}
1,2-Dichloroethane	1.56×10^{-1}	2.95×10^{-2}	$2.71 \times 10^{+0}$	$1.27 \times 10^{+0}$	9.50×10^{-4}	2.000×10^{-5}
1,2-Dichloroethene(total)	1.67×10^{-1}	3.16×10^{-2}	$2.83 \times 10^{+0}$	$1.29 \times 10^{+0}$	9.50×10^{-4}	3.700×10^{-2}
2-Butanone	1.00×10^{-2}	1.89×10^{-3}	$1.11 \times 10^{+0}$	$1.02 \times 10^{+0}$	2.48×10^{-2}	$2.190 \times 10^{+0}$
2-Chlorophenol	7.82×10^{-1}	1.47×10^{-1}	$9.56 \times 10^{+0}$	$2.34 \times 10^{+0}$	NA	1.800×10^{-2}
2-Hexanone	1.33×10^{-1}	2.51×10^{-2}	$2.46 \times 10^{+0}$	$1.23 \times 10^{+0}$	NA	1.460×10^{-1}
2-Methylphenol	4.94×10^{-1}	9.32×10^{-2}	$6.41 \times 10^{+0}$	$1.85 \times 10^{+0}$	NA	1.830×10^{-1}
2-Methylnaphthalene	$4.01 \times 10^{+1}$	$7.57 \times 10^{+0}$	$4.41 \times 10^{+2}$	$6.98 \times 10^{+1}$	NA	1.460×10^{-1}
2,4-Dichlorophenol	$3.12 \times 10^{+0}$	5.88×10^{-1}	$3.51 \times 10^{+1}$	$6.34 \times 10^{+0}$	9.90×10^{-3}	1.100×10^{-2}
2,4-Dimethylphenol	$1.46 \times 10^{+0}$	2.75×10^{-1}	$1.70 \times 10^{+1}$	$3.50 \times 10^{+0}$	2.48×10^{-2}	7.300×10^{-2}

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
2,4-Dinitrotoluene	5.27×10^{-1}	9.94×10^{-2}	$6.77 \times 10^{+0}$	$1.90 \times 10^{+0}$	1.90×10^{-3}	1.300×10^{-5}
2,6-Dinitrotoluene	$1.05 \times 10^{+0}$	1.99×10^{-1}	$1.25 \times 10^{+1}$	$2.81 \times 10^{+0}$	1.90×10^{-3}	1.300×10^{-5}
3,3'-Dichlorobenzidine	$1.80 \times 10^{+1}$	$3.39 \times 10^{+0}$	$1.98 \times 10^{+2}$	$3.18 \times 10^{+1}$	1.90×10^{-3}	1.900×10^{-5}
4-Chloro-3-methylphenol	$6.99 \times 10^{+0}$	$1.32 \times 10^{+0}$	$7.75 \times 10^{+1}$	$1.30 \times 10^{+1}$	NA	1.830×10^{-1}
4-Methyl-2-pentanone	6.82×10^{-2}	1.29×10^{-2}	$1.75 \times 10^{+0}$	$1.12 \times 10^{+0}$	2.48×10^{-2}	1.830×10^{-1}
4-Methylphenol	4.40×10^{-1}	8.30×10^{-2}	$5.82 \times 10^{+0}$	$1.76 \times 10^{+0}$	NA	1.830×10^{-1}
4-Nitroaniline	1.36×10^{-1}	2.56×10^{-2}	$2.49 \times 10^{+0}$	$1.23 \times 10^{+0}$	NA	1.100×10^{-2}
4-Nitrophenol	4.51×10^{-1}	8.50×10^{-2}	$5.94 \times 10^{+0}$	$1.77 \times 10^{+0}$	7.07×10^{-2}	2.260×10^{-1}
4,4'-DDE	$5.05 \times 10^{+4}$	$9.52 \times 10^{+3}$	$5.52 \times 10^{+5}$	$8.65 \times 10^{+4}$	1.20×10^{-4}	2.500×10^{-5}
4,4'-DDT	$8.59 \times 10^{+3}$	$1.62 \times 10^{+3}$	$9.41 \times 10^{+4}$	$1.47 \times 10^{+4}$	NA	2.500×10^{-5}
Acenaphthene	$4.61 \times 10^{+1}$	$8.70 \times 10^{+0}$	$5.06 \times 10^{+2}$	$8.01 \times 10^{+1}$	1.70×10^{-3}	2.190×10^{-1}
Acenaphthylene	$6.49 \times 10^{+1}$	$1.22 \times 10^{+1}$	$7.11 \times 10^{+2}$	$1.12 \times 10^{+2}$	1.70×10^{-3}	NA
Acetone	3.16×10^{-3}	5.96×10^{-4}	$1.03 \times 10^{+0}$	$1.01 \times 10^{+0}$	2.48×10^{-2}	3.650×10^{-1}
Aldrin	$7.15 \times 10^{+2}$	$1.35 \times 10^{+2}$	$7.83 \times 10^{+3}$	$1.23 \times 10^{+3}$	5.93×10^{-4}	5.000×10^{-7}
Alpha-chlordane	$3.34 \times 10^{+0}$	6.31×10^{-1}	$3.76 \times 10^{+1}$	$6.73 \times 10^{+0}$	NA	6.600×10^{-6}
Anthracene	$1.55 \times 10^{+2}$	$2.93 \times 10^{+1}$	$1.70 \times 10^{+3}$	$2.67 \times 10^{+2}$	3.80×10^{-4}	$1.095 \times 10^{+0}$
Aroclor-1254	$5.93 \times 10^{+3}$	$1.12 \times 10^{+3}$	$6.50 \times 10^{+4}$	$1.02 \times 10^{+4}$	NA	1.100×10^{-6}
Aroclor-1260	$7.15 \times 10^{+3}$	$1.35 \times 10^{+3}$	$7.83 \times 10^{+4}$	$1.23 \times 10^{+4}$	NA	1.100×10^{-6}

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Benzene	7.48×10^{-1}	1.41×10^{-1}	$9.20 \times 10^{+0}$	$2.28 \times 10^{+0}$	9.50×10^{-4}	6.200×10^{-5}
Benzo(a)anthracene	$2.22 \times 10^{+3}$	$4.18 \times 10^{+2}$	$2.43 \times 10^{+4}$	$3.80 \times 10^{+3}$	2.50×10^{-4}	7.700×10^{-6}
Benzo(a)pyrene	$5.29 \times 10^{+3}$	$9.99 \times 10^{+2}$	$5.80 \times 10^{+4}$	$9.08 \times 10^{+3}$	2.50×10^{-4}	1.200×10^{-6}
Benzo(b)fluoranthene	$2.06 \times 10^{+4}$	$3.89 \times 10^{+3}$	$2.26 \times 10^{+5}$	$3.54 \times 10^{+4}$	2.80×10^{-4}	9.500×10^{-6}
Benzo(g,h,i)perylene	$9.42 \times 10^{+4}$	$1.78 \times 10^{+4}$	$1.03 \times 10^{+6}$	$1.62 \times 10^{+5}$	2.70×10^{-4}	NA
Benzo(k)fluoranthene	$3.84 \times 10^{+4}$	$7.24 \times 10^{+3}$	$4.20 \times 10^{+5}$	$6.58 \times 10^{+4}$	8.00×10^{-5}	2.200×10^{-5}
Benzoic acid	4.11×10^{-1}	7.75×10^{-2}	$5.50 \times 10^{+0}$	$1.70 \times 10^{+0}$	9.90×10^{-2}	$1.460 \times 10^{+1}$
Benzyl alcohol	6.99×10^{-2}	1.32×10^{-2}	$1.76 \times 10^{+0}$	$1.12 \times 10^{+0}$	NA	$1.095 \times 10^{+0}$
Beta-BHC	$3.50 \times 10^{+1}$	$6.60 \times 10^{+0}$	$3.84 \times 10^{+2}$	$6.10 \times 10^{+1}$	2.80×10^{-3}	4.700×10^{-6}
Bis(2-chloroisopropyl)ether	6.99×10^{-1}	1.32×10^{-1}	$8.65 \times 10^{+0}$	$2.20 \times 10^{+0}$	NA	4.200×10^{-5}
Bis(2-ethylhexyl)phthalate	$1.11 \times 10^{+3}$	$2.09 \times 10^{+2}$	$1.21 \times 10^{+4}$	$1.90 \times 10^{+3}$	1.78×10^{-3}	6.100×10^{-4}
Bromodichloromethane	4.21×10^{-1}	7.94×10^{-2}	$5.61 \times 10^{+0}$	$1.72 \times 10^{+0}$	NA	1.400×10^{-4}
Bromomethane	6.99×10^{-2}	1.32×10^{-2}	$1.76 \times 10^{+0}$	$1.12 \times 10^{+0}$	1.82×10^{-2}	1.080×10^{-3}
Butylbenzylphthalate	$3.34 \times 10^{+1}$	$6.31 \times 10^{+0}$	$3.67 \times 10^{+2}$	$5.83 \times 10^{+1}$	3.85×10^{-3}	7.300×10^{-1}
Carbazole	$1.08 \times 10^{+1}$	$2.04 \times 10^{+0}$	$1.19 \times 10^{+2}$	$1.95 \times 10^{+1}$	NA	4.300×10^{-4}
Carbon disulfide	8.04×10^{-1}	1.52×10^{-1}	$9.80 \times 10^{+0}$	$2.38 \times 10^{+0}$	6.20×10^{-3}	2.800×10^{-3}
Chlorobenzene	$3.84 \times 10^{+0}$	7.24×10^{-1}	$4.30 \times 10^{+1}$	$7.58 \times 10^{+0}$	1.16×10^{-3}	5.200×10^{-3}
Chloroform	5.17×10^{-1}	9.76×10^{-2}	$6.66 \times 10^{+0}$	$1.89 \times 10^{+0}$	3.79×10^{-3}	2.800×10^{-5}

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Chrysene	$2.22 \times 10^{+3}$	$4.18 \times 10^{+2}$	$2.43 \times 10^{+4}$	$3.80 \times 10^{+3}$	1.70×10^{-4}	2.700×10^{-4}
Di-n-butylphthalate	$8.76 \times 10^{+2}$	$1.65 \times 10^{+2}$	$9.59 \times 10^{+3}$	$1.50 \times 10^{+3}$	3.01×10^{-2}	3.650×10^{-1}
Di-n-octylphthalate	$8.76 \times 10^{+6}$	$1.65 \times 10^{+6}$	$9.59 \times 10^{+7}$	$1.50 \times 10^{+7}$	1.90×10^{-3}	7.300×10^{-2}
Dibenzo(a,h)anthracene	$5.17 \times 10^{+3}$	$9.76 \times 10^{+2}$	$5.66 \times 10^{+4}$	$8.87 \times 10^{+3}$	1.80×10^{-4}	1.100×10^{-6}
Dibenzofuran	$7.32 \times 10^{+1}$	$1.38 \times 10^{+1}$	$8.02 \times 10^{+2}$	$1.27 \times 10^{+2}$	6.19×10^{-3}	NA
Dieldrin	$6.82 \times 10^{+1}$	$1.29 \times 10^{+1}$	$7.48 \times 10^{+2}$	$1.18 \times 10^{+2}$	2.71×10^{-4}	5.300×10^{-7}
Diethylphthalate	4.11×10^{-1}	7.75×10^{-2}	$5.50 \times 10^{+0}$	$1.70 \times 10^{+0}$	3.09×10^{-3}	$2.920 \times 10^{+0}$
Endosulfan II	$2.31 \times 10^{+1}$	$4.36 \times 10^{+0}$	$2.54 \times 10^{+2}$	$4.07 \times 10^{+1}$	NA	2.190×10^{-2}
Endosulfan sulfate	$2.53 \times 10^{+1}$	$4.78 \times 10^{+0}$	$2.78 \times 10^{+2}$	$4.45 \times 10^{+1}$	NA	2.190×10^{-2}
Endrin	$2.21 \times 10^{+3}$	$4.16 \times 10^{+2}$	$2.42 \times 10^{+4}$	$3.79 \times 10^{+3}$	NA	1.100×10^{-3}
Endrin aldehyde	$7.76 \times 10^{+0}$	$1.46 \times 10^{+0}$	$8.60 \times 10^{+1}$	$1.43 \times 10^{+1}$	NA	1.100×10^{-3}
Ethylbenzene	$7.76 \times 10^{+0}$	$1.46 \times 10^{+0}$	$8.60 \times 10^{+1}$	$1.43 \times 10^{+1}$	3.04×10^{-3}	1.580×10^{-1}
Fluoranthene	$1.19 \times 10^{+3}$	$2.24 \times 10^{+2}$	$1.30 \times 10^{+4}$	$2.04 \times 10^{+3}$	3.90×10^{-4}	1.460×10^{-1}
Fluorene	$8.32 \times 10^{+1}$	$1.57 \times 10^{+1}$	$9.12 \times 10^{+2}$	$1.44 \times 10^{+2}$	5.77×10^{-3}	1.460×10^{-1}
Heptachlor epoxide	$2.49 \times 10^{+0}$	4.71×10^{-1}	$2.83 \times 10^{+1}$	$5.28 \times 10^{+0}$	6.28×10^{-4}	2.000×10^{-7}
Heptachlorodibenzofurans	$3.66 \times 10^{+3}$	$6.91 \times 10^{+2}$	$4.01 \times 10^{+4}$	$6.29 \times 10^{+3}$	6.19×10^{-3}	NA
Hexachlorobutadiene	$3.34 \times 10^{+2}$	$6.31 \times 10^{+1}$	$3.66 \times 10^{+3}$	$5.74 \times 10^{+2}$	1.90×10^{-3}	2.300×10^{-5}
Indeno(1,2,3-cd)pyrene	$2.53 \times 10^{+5}$	$4.78 \times 10^{+4}$	$2.77 \times 10^{+6}$	$4.35 \times 10^{+5}$	2.40×10^{-4}	4.300×10^{-6}

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Isophorone	2.78×10^{-1}	5.24×10^{-2}	$4.04 \times 10^{+0}$	$1.48 \times 10^{+0}$	1.24×10^{-2}	9.000×10^{-3}
Methoxychlor	$2.66 \times 10^{+2}$	$5.01 \times 10^{+1}$	$2.91 \times 10^{+3}$	$4.57 \times 10^{+2}$	1.90×10^{-3}	1.800×10^{-2}
Methylene chloride	9.87×10^{-2}	1.86×10^{-2}	$2.08 \times 10^{+0}$	$1.17 \times 10^{+0}$	2.48×10^{-2}	6.300×10^{-4}
N-nitroso-di-n-propylamine	1.72×10^{-1}	3.24×10^{-2}	$2.88 \times 10^{+0}$	$1.29 \times 10^{+0}$	1.90×10^{-3}	1.200×10^{-6}
N-nitrosodiphenylamine	$7.48 \times 10^{+0}$	$1.41 \times 10^{+0}$	$8.30 \times 10^{+1}$	$1.38 \times 10^{+1}$	1.02×10^{-2}	1.700×10^{-3}
Napthalene	$1.28 \times 10^{+1}$	$2.41 \times 10^{+0}$	$1.41 \times 10^{+2}$	$2.29 \times 10^{+1}$	2.69×10^{-3}	1.460×10^{-1}
Octachlorodibenzo-p-dioxin	$5.82 \times 10^{+4}$	$1.10 \times 10^{+4}$	$6.37 \times 10^{+5}$	$9.99 \times 10^{+4}$	NA	NA
Octachlorodibenzofuran	$5.17 \times 10^{+5}$	$9.76 \times 10^{+4}$	$5.66 \times 10^{+6}$	$8.87 \times 10^{+5}$	6.19×10^{-3}	NA
Phenanthrene	$1.61 \times 10^{+2}$	$3.03 \times 10^{+1}$	$1.76 \times 10^{+3}$	$2.77 \times 10^{+2}$	8.70×10^{-4}	NA
Phenol	1.60×10^{-1}	3.01×10^{-2}	$2.75 \times 10^{+0}$	$1.27 \times 10^{+0}$	2.48×10^{-2}	$2.190 \times 10^{+0}$
Pyrene	$8.37 \times 10^{+2}$	$1.58 \times 10^{+2}$	$9.17 \times 10^{+3}$	$1.44 \times 10^{+3}$	9.00×10^{-5}	1.100×10^{-1}
Styrene	$4.94 \times 10^{+0}$	9.32×10^{-1}	$5.51 \times 10^{+1}$	$9.47 \times 10^{+0}$	3.30×10^{-3}	2.800×10^{-4}
Tetrachloroethene	$1.88 \times 10^{+0}$	3.55×10^{-1}	$2.16 \times 10^{+1}$	$4.22 \times 10^{+0}$	4.20×10^{-4}	3.700×10^{-2}
Toluene	$2.72 \times 10^{+0}$	5.12×10^{-1}	$3.07 \times 10^{+1}$	$5.66 \times 10^{+0}$	3.30×10^{-3}	9.300×10^{-2}
Tributylphosphate	$5.54 \times 10^{+1}$	$1.05 \times 10^{+1}$	$6.08 \times 10^{+2}$	$9.61 \times 10^{+1}$	NA	1.800×10^{-2}
Trichloroethene	$1.88 \times 10^{+0}$	3.55×10^{-1}	$2.16 \times 10^{+1}$	$4.22 \times 10^{+0}$	4.20×10^{-4}	2.500×10^{-4}
Xylenes, Total	$6.10 \times 10^{+0}$	$1.15 \times 10^{+0}$	$6.78 \times 10^{+1}$	$1.15 \times 10^{+1}$	1.90×10^{-3}	$7.300 \times 10^{+0}$

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Inorganics						
Aluminum	$1.50 \times 10^{+3}$	$1.50 \times 10^{+3}$	$1.64 \times 10^{+4}$	$1.36 \times 10^{+4}$	NA	NA
Antimony	$2.50 \times 10^{+2}$	$4.50 \times 10^{+1}$	$2.74 \times 10^{+3}$	$4.10 \times 10^{+2}$	NA	1.500×10^{-3}
Arsenic	$2.00 \times 10^{+2}$	$2.00 \times 10^{+2}$	$2.19 \times 10^{+3}$	$1.82 \times 10^{+3}$	NA	4.900×10^{-6}
Barium	$1.14 \times 10^{+3}$	$2.00 \times 10^{+1}$	$1.25 \times 10^{+4}$	$1.83 \times 10^{+2}$	NA	2.600×10^{-1}
Beryllium	$1.30 \times 10^{+3}$	$2.50 \times 10^{+2}$	$1.42 \times 10^{+4}$	$2.27 \times 10^{+3}$	NA	2.000×10^{-6}
Boron	$3.00 \times 10^{+0}$	$3.00 \times 10^{+0}$	$3.39 \times 10^{+1}$	$2.83 \times 10^{+1}$	NA	3.300×10^{-1}
Cadmium	$5.00 \times 10^{+2}$	$1.20 \times 10^{+1}$	$5.48 \times 10^{+3}$	$1.10 \times 10^{+2}$	NA	1.800×10^{-3}
Chromium (Trivalent)	$1.50 \times 10^{+3}$	$7.00 \times 10^{+1}$	$1.64 \times 10^{+4}$	$6.38 \times 10^{+2}$	NA	3.70×10^{0}
Chromium (Hexavalent)	$3.70 \times 10^{+1}$	3.70×10^{0}	$4.06 \times 10^{+2}$	$3.46 \times 10^{+1}$	NA	1.80×10^{-2}
Cobalt	$5.50 \times 10^{+2}$	$6.00 \times 10^{+1}$	$6.02 \times 10^{+3}$	$5.47 \times 10^{+2}$	NA	2.200×10^{-1}
Copper	$1.25 \times 10^{+2}$	$3.50 \times 10^{+1}$	$1.37 \times 10^{+3}$	$3.19 \times 10^{+2}$	NA	NA
Cyanide	4.29×10^{-2}	1.85×10^{-2}	$1.47 \times 10^{+0}$	$1.17 \times 10^{+0}$	9.50×10^{-4}	7.300×10^{-2}
Lead	$3.00 \times 10^{+3}$	$3.80 \times 10^{+1}$	$3.29 \times 10^{+4}$	$3.47 \times 10^{+2}$	NA	NA
Magnesium	$4.50 \times 10^{+0}$	$4.50 \times 10^{+0}$	$5.03 \times 10^{+1}$	$4.19 \times 10^{+1}$	NA	$3.500 \times 10^{+1}$
Manganese	$1.80 \times 10^{+2}$	$5.00 \times 10^{+1}$	$1.97 \times 10^{+3}$	$4.56 \times 10^{+2}$	NA	1.800×10^{-2}
Mercury	$1.00 \times 10^{+1}$	$1.00 \times 10^{+1}$	$1.11 \times 10^{+2}$	$9.19 \times 10^{+1}$	NA	1.100×10^{-3}
Molybdenum	$9.00 \times 10^{+1}$	$1.00 \times 10^{+1}$	$9.87 \times 10^{+2}$	$9.19 \times 10^{+1}$	NA	1.800×10^{-2}

TABLE F.3.4-4
(Continued)

Constituent	K_d Vadose 1[a] (mL/g)	K_d Vadose 2[b] (mL/g)	R_d Vadose 1	R_d Vadose 2	λ[c] (L/day)	Screening Level[d] (mg/L)
Nickel	$6.50 \times 10^{+2}$	$4.00 \times 10^{+2}$	$7.12 \times 10^{+3}$	$3.64 \times 10^{+3}$	NA	7.300×10^{-2}
Selenium	$7.40 \times 10^{+2}$	$1.50 \times 10^{+2}$	$8.10 \times 10^{+3}$	$1.36 \times 10^{+3}$	NA	1.800×10^{-2}
Silver	$1.80 \times 10^{+2}$	$9.00 \times 10^{+1}$	$1.97 \times 10^{+3}$	$8.19 \times 10^{+2}$	NA	1.800×10^{-2}
Thallium	$1.50 \times 10^{+3}$	$1.50 \times 10^{+3}$	$1.64 \times 10^{+4}$	$1.36 \times 10^{+4}$	NA	2.600×10^{-4}
Vanadium	$1.00 \times 10^{+3}$	$2.00 \times 10^{+2}$	$1.10 \times 10^{+4}$	$1.82 \times 10^{+3}$	NA	2.600×10^{-2}
Zinc	$2.40 \times 10^{+3}$	$2.00 \times 10^{+2}$	$2.63 \times 10^{+4}$	$1.82 \times 10^{+3}$	NA	$1.100 \times 10^{+0}$

[a]Gray clay within the glacial overburden
[b]Unsaturated sand and gravel
[c]Radioactive or degradation rate
[d]Based on 10^{-7} risk or 0.1 HQ level
[e]Uranium-Total carried through modeling steps; Uranium-234, Uranium-235/236, and Uranium-238 concentrations established through ratios
NA Not Available or Not Applicable

TABLE F.3.4-5

GENERAL PHYSICAL AND CHEMICAL CONDITIONS OF OPERABLE UNIT 5 CONTAMINANT SOURCE AREAS AND MIGRATION MEDIA

Parameter	Units	Vadose 1[a]	Vadose 2[b]
Fines Passing < 200 mesh F	(5)/100	8.50×10^{-1}	1.65×10^{-1}
Organic Carbon Content Foc	(%)/100	1.00×10^{-2}	5.00×10^{-3}
Bulk Density	(g/ml)	2.19×10^{0}	1.85×10^{0}
Porosity	(%)/100	2.00×10^{-1}	3.00×10^{-1}
Field Capacity	(%)/100	1.65×10^{-1}	1.08×10^{-1}
Moisture Content	(%)/100	2.00×10^{-1}	2.04×10^{-1}
Soil-Dependent Parameter 1/(2b+3)		3.90×10^{-2}	9.00×10^{-2}

[a]Glacial overburden.
[b]Unsaturated sand and gravel.

TABLE F.3.4-6

SUMMARY OF PREDICTED LOADING OF CPCs THROUGH PADDYS RUN AND SSOD INTO THE GREAT MIAMI AQUIFER BASELINE AND FUTURE CONDITIONS

Constituents of Concern	Condition	Section C-D[a] (Kg/yr)	Section D-E[a] (Kg/yr)	Section E-F[a] (Kg/yr)	SSOD (Kg/yr)
Radionuclides					
Neptunium-237	Baseline	9.96×10^{-5}	3.75×10^{-5}	4.00×10^{-6}	0.00×10^{0}
	Future	1.11×10^{-4}	4.27×10^{-5}	6.90×10^{-6}	1.23×10^{-4}
Plutonium-238	Baseline	4.39×10^{-11}	1.90×10^{-11}	1.48×10^{-11}	4.44×10^{-10}
	Future	3.24×10^{-11}	1.43×10^{-11}	5.72×10^{-11}	2.47×10^{-9}
Plutonium-239/240	Baseline	N/A	N/A	N/A	N/A
	Future	6.23×10^{-9}	2.64×10^{-9}	6.58×10^{-9}	2.80×10^{-7}
Radium-226	Baseline	2.91×10^{-7}	1.09×10^{-7}	1.15×10^{-8}	4.20×10^{-8}
	Future	3.12×10^{-7}	1.19×10^{-7}	8.59×10^{-8}	3.37×10^{-6}
Strontium-90	Baseline	8.98×10^{-9}	4.04×10^{-9}	8.84×10^{-10}	1.75×10^{-8}
	Future	1.76×10^{-9}	7.95×10^{-10}	2.23×10^{-10}	6.68×10^{-9}
Technetium-99	Baseline	5.42×10^{-3}	1.11×10^{-2}	1.26×10^{-3}	9.10×10^{-3}
	Future	6.03×10^{-3}	1.14×10^{-2}	2.32×10^{-3}	6.11×10^{-2}
Thorium-230	Baseline	N/A	N/A	N/A	N/A
	Future	1.55×10^{-6}	7.98×10^{-7}	7.37×10^{-7}	2.92×10^{-5}
Thorium-232	Baseline	N/A	N/A	N/A	N/A
	Future	2.92×10^{-2}	1.45×10^{-2}	1.09×10^{-2}	4.15×10^{-1}
Uranium-Total	Baseline	$1.14 \times 10^{+1}$	$4.69 \times 10^{+0}$	$1.80 \times 10^{+0}$	$4.58 \times 10^{+1}$
	Future	$1.23 \times 10^{+1}$	5.13×10^{0}	$3.20 \times 10^{+1}$	$1.40 \times 10^{+3}$
Organics					
Aroclor-1254	Baseline	3.35×10^{-4}	1.23×10^{-4}	1.77×10^{-5}	2.09×10^{-4}
	Future	3.46×10^{-4}	1.29×10^{-4}	1.03×10^{-4}	4.10×10^{-3}
Aroclor-1260	Baseline	N/A	N/A	N/A	N/A
	Future	1.14×10^{-5}	4.15×10^{-6}	2.87×10^{-5}	1.27×10^{-3}
Alpha-chlordane	Baseline	N/A	N/A	N/A	N/A
	Future	0.00×10^{0}	0.00×10^{0}	5.46×10^{-5}	2.44×10^{-3}
Benzene	Baseline	1.31×10^{-2}	4.77×10^{-3}	4.45×10^{-4}	0.00×10^{0}
	Future	N/A	N/A	N/A	N/A
Benzo(a)anthracene	Baseline	3.99×10^{-3}	1.50×10^{-3}	1.56×10^{-4}	4.31×10^{-4}
	Future	N/A	N/A	N/A	N/A
Benzo(a)pyrene	Baseline	2.08×10^{-3}	7.76×10^{-4}	8.14×10^{-5}	2.87×10^{-4}
	Future	N/A	N/A	N/A	N/A
Bis(2-chloroisopropyl)ether	Baseline	4.77×10^{-2}	2.10×10^{-2}	3.44×10^{-3}	0.00×10^{0}
	Future	4.77×10^{-2}	2.14×10^{-2}	5.33×10^{-3}	1.04×10^{-1}
Bromodichloromethane	Baseline	0.00×10^{0}	1.36×10^{-2}	1.08×10^{-3}	0.00×10^{0}
	Future	0.00×10^{0}	1.37×10^{-2}	9.84×10^{-4}	0.00×10^{0}
Bromomethane	Baseline	N/A	N/A	N/A	N/A
		0.00×10^{0}	0.00×10^{0}	6.09×10^{-2}	2.72×10^{0}

TABLE F.3.4-6
(Continued)

Constituents of Concern	Condition	Section C-D[a] (Kg/yr)	Section D-E[a] (Kg/yr)	Section E-F[a] (Kg/yr)	SSOD (Kg/yr)
Chloroform	Baseline	0.00×10^{0}	6.20×10^{-2}	4.91×10^{-3}	0.00×10^{0}
	Future	N/A	N/A	N/A	N/A
Dibenzo(a,h)anthracene	Baseline	6.04×10^{-4}	2.20×10^{-4}	2.40×10^{-5}	1.24×10^{-4}
	Future	N/A	N/A	N/A	N/A
3,3-Dichlorobenzidine	Baseline	9.30×10^{-3}	3.39×10^{-3}	3.16×10^{-4}	$0.00 \times 10^{+0}$
	Future	N/A	N/A	N/A	N/A
1,1-Dichloroethane	Baseline	$0.00 \times 10^{+0}$	$0.00 \times 10^{+0}$	2.57×10^{-3}	9.71×10^{-2}
	Future	N/A	N/A	N/A	N/A
Dieldrin	Baseline	1.15×10^{-3}	4.17×10^{-4}	3.90×10^{-5}	0.00×10^{0}
	Future	N/A	N/A	N/A	N/A
Methylene Chloride	Baseline	6.84×10^{0}	2.50×10^{0}	2.43×10^{-1}	2.07×10^{-1}
	Future	N/A	N/A	N/A	N/A
4-Methylphenol	Baseline	6.47×10^{-3}	4.19×10^{-1}	7.42×10^{-1}	$2.67 \times 10^{+1}$
	Future	6.49×10^{-3}	4.21×10^{-1}	6.32×10^{-1}	$2.69 \times 10^{+1}$
4-Nitroaniline	Baseline	1.02×10^{0}	3.72×10^{-1}	3.47×10^{-2}	0.00×10^{0}
	Future	1.03×10^{0}	3.73×10^{-1}	2.99×10^{-2}	0.00×10^{0}
N-nitroso-di-n-propylamine	Baseline	1.07×10^{-1}	3.90×10^{-2}	3.64×10^{-3}	0.00×10^{0}
	Future	N/A	N/A	N/A	N/A
Inorganics					
Antimony	Baseline	N/A	N/A	N/A	N/A
	Future	2.91×10^{-1}	1.23×10^{-1}	2.43×10^{-2}	4.69×10^{-1}
Arsenic	Baseline	5.23×10^{-1}	2.67×10^{-1}	5.12×10^{-2}	7.45×10^{-1}
	Future	5.63×10^{-1}	2.87×10^{-1}	5.91×10^{-2}	1.30×10^{0}
Beryllium	Baseline	8.06×10^{-3}	5.03×10^{-3}	9.82×10^{-4}	1.76×10^{-2}
	Future	8.72×10^{-3}	5.36×10^{-3}	1.17×10^{-3}	3.00×10^{-2}
Cyanide	Baseline	$2.02 \times 10^{+1}$	$1.14 \times 10^{+1}$	$2.83 \times 10^{+0}$	$6.26 \times 10^{+1}$
	Future	$2.27 \times 10^{+1}$	$1.26 \times 10^{+1}$	3.55×10^{0}	$1.06 \times 10^{+2}$
Lead	Baseline	1.14×10^{-1}	5.53×10^{-2}	1.16×10^{-1}	$4.15 \times 10^{+0}$
	Future	1.24×10^{-1}	5.98×10^{-2}	1.06×10^{-1}	4.48×10^{0}
Magnesium	Baseline	$4.20 \times 10^{+4}$	$2.46 \times 10^{+4}$	$4.75 \times 10^{+3}$	$8.80 \times 10^{+4}$
	Future	$4.50 \times 10^{+4}$	$2.60 \times 10^{+4}$	$5.85 \times 10^{+3}$	$1.59 \times 10^{+5}$
Manganese	Baseline	$3.16 \times 10^{+1}$	$2.41 \times 10^{+1}$	$6.33 \times 10^{+0}$	$1.51 \times 10^{+2}$
	Future	$3.75 \times 10^{+1}$	$2.69 \times 10^{+1}$	$7.16 \times 10^{+0}$	$2.12 \times 10^{+2}$
Mercury	Baseline	1.99×10^{-1}	1.27×10^{-1}	2.92×10^{-2}	6.22×10^{-1}
	Future	2.23×10^{-1}	1.39×10^{-1}	3.97×10^{-2}	$1.21 \times 10^{+0}$

[a]See Figures 5-25 and 5-26
N/A - Not applicable

TABLE F.3.4-7

SUMMARY OF SURFACE WATER LOADING CONCENTRATIONS TO THE GMA SURFACE WATER AS A SOURCE

Constituent of Potential Concern	Reach	Surface Water Mass Loading Rate (kg/yr)	Swift Calibrated Infiltration Rate (ft/day)	Area (ft^2)	Infiltration Flow Rate (L/yr)	Loading Concentration ($\mu g/L$)
Radionuclide						
Plutonium-238	SSOD	2.47×10^{-9}	1.14×10^{-2}	24000	2.83×10^{6}	8.73×10^{-7}
Plutonium-239/240	SSOD	2.80×10^{-7}	1.14×10^{-2}	24000	2.83×10^{6}	9.87×10^{-5}
Thorium-230	SSOD	2.92×10^{-5}	1.14×10^{-2}	24000	2.83×10^{6}	1.03×10^{-2}
Thorium-232	SSOD	4.15×10^{-1}	1.14×10^{-2}	24000	2.83×10^{6}	1.47×10^{2}
Uranium-234	SSOD	9.51×10^{-2}	1.14×10^{-2}	24000	2.83×10^{6}	3.36×10^{1}
Uranium-235/236	SSOD	1.68×10^{1}	1.14×10^{-2}	24000	2.83×10^{6}	5.93×10^{3}
Uranium-238	SSOD	2.05×10^{3}	1.14×10^{-2}	24000	2.83×10^{6}	7.24×10^{5}
Inorganic						
Cyanide	SSOD	1.06×10^{2}	1.14×10^{-2}	24000	2.83×10^{6}	3.74×10^{4}
Lead	SSOD	4.48×10^{0}	1.14×10^{-2}	24000	2.83×10^{6}	1.58×10^{3}
Magnesium	SSOD	1.59×10^{5}	1.14×10^{-2}	24000	2.83×10^{6}	5.60×10^{7}
Organic						
Alpha-chlordane	SSOD	6.92×10^{2}	1.14×10^{-2}	24000	2.83×10^{6}	8.63×10^{-1}
Arochlor-1254	SSOD	1.16×10^{3}	1.14×10^{-2}	24000	2.83×10^{6}	1.45×10^{0}
Arochlor-1260	SSOD	3.60×10^{2}	1.14×10^{-2}	24000	2.83×10^{6}	4.48×10^{-1}

TABLE F.3.4-7 (Continued)

Constituent of Potential Concern	Reach	Surface Water Mass Loading Rate (kg/yr)	Swift Calibrated Infiltration Rate (ft/day)	Area (ft^2)	Infiltration Flow Rate (L/yr)	Loading Concentration ($\mu g/L$)
Benzene	CD	3.27×10^{2}	4.02×10^{-2}	77325	3.21×10^{7}	4.08×10^{-1}
Benzo(a)anthracene	SSOD	1.22×10^{2}	1.14×10^{-2}	24000	2.83×10^{6}	1.52×10^{-1}
Benzo(a)pyrene	SSOD	8.12×10^{1}	1.14×10^{-2}	24000	2.83×10^{6}	1.01×10^{-1}
Bis(2-chloroisopropyl)ether	SSOD	2.94×10^{4}	1.14×10^{-2}	24000	2.83×10^{6}	3.67×10^{1}
Bromodichloromethane	DE	8.08×10^{2}	1.89×10^{-2}	69325	1.36×10^{7}	1.01×10^{0}
Bromomethane	SSOD	7.71×10^{5}	1.14×10^{-2}	24000	2.83×10^{6}	9.62×10^{2}
Chloroform	DE	3.66×10^{3}	1.89×10^{-2}	69325	1.36×10^{7}	4.57×10^{0}
Dibenzo(a,h)anthracene	SSOD	3.51×10^{1}	1.14×10^{-2}	24000	2.83×10^{6}	4.38×10^{-2}
Dieldrin	CD	1.15×10^{-3}	4.02×10^{-2}	77325	3.21×10^{7}	3.57×10^{-2}
3,3'-Dichlorobenzidine	CD	2.32×10^{2}	4.02×10^{-2}	77325	3.21×10^{7}	2.90×10^{-1}
1,1-Dichloroethene	SSOD	2.75×10^{4}	1.14×10^{-2}	24000	2.83×10^{6}	3.43×10^{1}
Methylene chloride	SSOD	1.71×10^{5}	1.14×10^{-2}	24000	2.83×10^{6}	2.13×10^{2}
4-Methylphenol	SSOD	7.62×10^{6}	1.14×10^{-2}	24000	2.83×10^{6}	9.51×10^{3}
4-Nitroaniline	CD	2.56×10^{4}	4.02×10^{-2}	77325	3.21×10^{7}	3.19×10^{1}
N-nitroso-di-n-propylamine	CD	2.68×10^{3}	4.02×10^{-2}	77325	3.21×10^{7}	3.34×10^{0}

SSOD = Storm Sewer Outfall Ditch
CD = Reach CD in Paddys Run
DE = Reach DE in Paddys Run

TABLE F.3.4-8

SOURCE CONCENTRATIONS AND INVENTORIES IN THE GROUNDWATER PATHWAY - INITIAL GREAT MIAMI AQUIFER CONDITIONS

	Neptunium-237	Radium-226	Technetium-99	Uranium-Total	Arsenic	Manganese	Antimony
Mass (mg)							
Layer 1	4.06×10^{5}	1.22×10^{3}	3.34×10^{3}	1.50×10^{9}	1.01×10^{10}	2.45×10^{11}	1.66×10^{11}
Layer 2	2.03×10^{2}	2.14×10^{3}	6.78×10^{3}	3.29×10^{9}	2.36×10^{10}	7.19×10^{11}	0
Layer 3	1.40×10^{1}	7.75×10^{2}	1.79×10^{3}	2.63×10^{8}	6.21×10^{9}	1.90×10^{11}	2.66×10^{10}
Layer 4	1.10×10^{0}	2.44×10^{2}	8.18×10^{2}	8.26×10^{6}	4.01×10^{9}	5.77×10^{10}	0
Layer 5	1.32×10^{0}	1.77×10^{3}	2.30×10^{3}	3.99×10^{7}	7.77×10^{9}	3.53×10^{11}	0
Layer 6	6.58×10^{-2}	0.00×10^{0}	4.09×10^{2}	7.88×10^{4}	0.00×10^{0}	8.84×10^{10}	0
Total Mass in Layers 1-6	4.06×10^{5}	6.14×10^{3}	1.54×10^{4}	5.10×10^{9}	5.17×10^{10}	1.65×10^{12}	1.93×10^{11}
Maximum Concentration[a] (mg/L)							
Layer 1	1.60×10^{-6}	1.24×10^{-8}	1.28×10^{-5}	1.095×10^{0}	1.68×10^{-1}	1.75×10^{1}	8.18×10^{-2}
Layer 2	8.12×10^{-8}	6.22×10^{-9}	6.00×10^{-6}	5.47×10^{-1}	1.40×10^{-1}	8.88×10^{1}	0
Layer 3	1.99×10^{-8}	6.22×10^{-9}	6.00×10^{-6}	1.07×10^{-1}	1.62×10^{-1}	2.44×10^{0}	7.2×10^{-2}
Layer 4	1.56×10^{-8}	6.22×10^{-9}	6.00×10^{-6}	4.41×10^{-2}	8.10×10^{-2}	1.49×10^{0}	0
Layer 5	2.46×10^{-9}	6.22×10^{-9}	6.00×10^{-6}	4.41×10^{-2}	8.10×10^{-2}	1.49×10^{0}	0
Layer 6	2.75×10^{-10}	0.00×10^{0}	1.46×10^{-7}	1.23×10^{-4}	0.00×10^{0}	1.11×10^{0}	0
Maximum Concentration in Layers 1-6	1.60×10^{-6}	1.24×10^{-8}	1.28×10^{-5}	1.095×10^{0}	1.68×10^{-1}	8.88×10^{1}	8.18×10^{-2}

[a]Maximum concentrations are from measured groundwater data or the Supplemental Modeling Characterization

TABLE F.3.4-9

SURFACE SOIL SOURCE AREAS FOR SECONDARY CPCs MODELED BY ECTran
(SURFACE SOIL TO GMA PATHWAY)

Constituent of Potential Concern	Source Area	Receptor	Travel Distance (ft)	Width (ft)	Length (ft)
Organics					
Alpha-chlordane	1	FEMP FL	3100	$1.02 \times 10^{+03}$	$5.67 \times 10^{+02}$
		2071	4900	$1.02 \times 10^{+03}$	$5.67 \times 10^{+02}$
		2119	5000	$1.02 \times 10^{+03}$	$5.67 \times 10^{+02}$
		Strickers	7100	$1.02 \times 10^{+03}$	$5.67 \times 10^{+02}$
		Coll 1 River	7300	$1.02 \times 10^{+03}$	$5.67 \times 10^{+02}$
		Coll 2	7400	$1.02 \times 10^{+03}$	$5.67 \times 10^{+02}$
	2	FEMP FL	2700	$1.38 \times 10^{+03}$	$6.90 \times 10^{+02}$
		K3	4000	$1.38 \times 10^{+03}$	$6.90 \times 10^{+02}$
		Strickers	6000	$1.38 \times 10^{+03}$	$6.90 \times 10^{+02}$
		Coll 1 River	6300	$1.38 \times 10^{+03}$	$6.90 \times 10^{+02}$
Bis(2-chloroisopropyl)ether	1	FEMP FL	4100	$7.51 \times 10^{+02}$	$9.77 \times 10^{+02}$
		2119	5500	$7.51 \times 10^{+02}$	$9.77 \times 10^{+02}$
		Strickers	7600	$7.51 \times 10^{+02}$	$9.77 \times 10^{+02}$
		Coll 1 River	8000	$7.51 \times 10^{+02}$	$9.77 \times 10^{+02}$
		Coll 2	8000	$7.51 \times 10^{+02}$	$9.77 \times 10^{+02}$

TABLE F.3.4-9 (Continued)

Constituent of Potential Concern	Source Area	Receptor	Travel Distance (ft)	Width (ft)	Length (ft)
Bis(2-chloroisopropyl)ether (Continued)	2	FEMP FL	2000	$9.28 \times 10^{+02}$	$1.21 \times 10^{+03}$
		2071	3800	$9.28 \times 10^{+02}$	$1.21 \times 10^{+03}$
		Coll 1 River	6500	$9.28 \times 10^{+02}$	$1.21 \times 10^{+03}$
		Coll 2	6000	$9.28 \times 10^{+02}$	$1.21 \times 10^{+03}$
	3	FEMP FL	1500	$9.53 \times 10^{+02}$	$1.80 \times 10^{+02}$
		2119	3000	$9.53 \times 10^{+02}$	$1.80 \times 10^{+02}$
		Strickers	5100	$9.53 \times 10^{+02}$	$1.80 \times 10^{+02}$
		Coll 1 River	5400	$9.53 \times 10^{+02}$	$1.80 \times 10^{+02}$
		Coll 2	5400	$9.53 \times 10^{+02}$	$1.80 \times 10^{+02}$
Bromodichloromethane	1	FEMP FL	1700	$1.18 \times 10^{+03}$	$5.15 \times 10^{+02}$
		2119	3300	$1.18 \times 10^{+03}$	$5.15 \times 10^{+02}$
		Strickers	5300	$1.18 \times 10^{+03}$	$5.15 \times 10^{+02}$
		Coll 1 River	5700	$1.18 \times 10^{+03}$	$5.15 \times 10^{+02}$
		Coll 2	7200	$1.18 \times 10^{+03}$	$5.15 \times 10^{+02}$
Carbazole	1	FEMP FL	5600	$2.50 \times 10^{+02}$	$1.25 \times 10^{+02}$
		2119	7000	$2.50 \times 10^{+02}$	$1.25 \times 10^{+02}$
		Strickers	9200	$2.50 \times 10^{+02}$	$1.25 \times 10^{+02}$
		Coll 1 River	9500	$2.50 \times 10^{+02}$	$1.25 \times 10^{+02}$
		Coll 2	11500	$2.50 \times 10^{+02}$	$1.25 \times 10^{+02}$
		FEMP Well	1900	$2.50 \times 10^{+02}$	$1.25 \times 10^{+02}$

TABLE F.3.4-9 (Continued)

Constituent of Potential Concern	Source Area	Receptor	Travel Distance (ft)	Width (ft)	Length (ft)
Carbazole (Continued)	2	FEMP FL	2200	$5.15 \times 10^{+02}$	$1.55 \times 10^{+03}$
		2119	3600	$5.15 \times 10^{+02}$	$1.55 \times 10^{+03}$
		Strickers	5600	$5.15 \times 10^{+02}$	$1.55 \times 10^{+03}$
		Coll 1 River	6000	$5.15 \times 10^{+02}$	$1.55 \times 10^{+03}$
		Coll 2	8200	$5.15 \times 10^{+02}$	$1.55 \times 10^{+03}$
Inorganics					
Mercury	1	FEMP FL	2800	$6.85 \times 10^{+02}$	$1.16 \times 10^{+03}$
		2119	4200	$6.85 \times 10^{+02}$	$1.16 \times 10^{+03}$
		Strickers	6200	$6.85 \times 10^{+02}$	$1.16 \times 10^{+03}$
		Coll 1 River	6700	$6.85 \times 10^{+02}$	$1.16 \times 10^{+03}$
		Coll 2	7000	$6.85 \times 10^{+02}$	$1.16 \times 10^{+03}$
	2	FEMP FL	2800	$1.28 \times 10^{+03}$	$6.38 \times 10^{+02}$
		K3	3300	$1.28 \times 10^{+03}$	$6.38 \times 10^{+02}$

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TABLE F.3.4-10

HYDROGEOLOGIC DATA USED FOR MODELING SECONDARY CPCs WITH ECTran (SURFACE SOIL TO GMA PATHWAY)

Constituent of Potential Concern	Source Area	Receptor	Hydraulic Gradient	Saturated GMA Thickness (ft)	Horizontal Hydraulic Conductivity (ft/day)	Horizontal Seepage Velocity (ft/yr)	Source Area Infiltration (ft/yr)	Downgradient Area Infiltration (ft/yr)	Mixing Depth (ft)
Organics									
Alpha-chlordane	1	FEMP FL	6.77×10^{-04}	75	329	$2.71 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	20.3
		2071	5.92×10^{-04}	75	334	$2.41 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	21.2
		2119	5.40×10^{-04}	75	395	$2.60 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	20.6
		Strickers	4.51×10^{-04}	75	396	$2.17 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	22.0
		Coll1 River	4.93×10^{-04}	75	382	$2.29 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	21.6
		Coll 2	7.30×10^{-04}	75	370	$3.29 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	19.1
	2	FEMP FL	4.44×10^{-04}	75	638	$3.45 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	23.4
		K3	4.25×10^{-04}	75	638	$3.30 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	23.8
		Strickers	3.50×10^{-04}	75	511	$2.18 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	28.6
		Coll 1 River	3.49×10^{-04}	75	506	$2.15 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	28.8
Bis(2-chloroisopropyl)ether	1	FEMP FL	6.46×10^{-04}	75	424	$3.33 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	28.4
		2119	5.82×10^{-04}	75	418	$2.96 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	29.8
		Strickers	4.86×10^{-04}	75	413	$2.44 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	32.3
		Coll 1 River	5.13×10^{-04}	75	412	$2.57 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	31.5
		Coll 2	7.38×10^{-04}	75	400	$3.59 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	27.6

TABLE F.3.4-10 (Continued)

Constituent of Potential Concern	Source Area	Receptor	Hydraulic Gradient	Saturated GMA Thickness (ft)	Horizontal Hydraulic Conductivity (ft/day)	Horizontal Seepage Velocity (ft/yr)	Source Area Infiltration (ft/yr)	Downgradient Area Infiltration (ft/yr)	Mixing Depth (ft)
Bis(2-chloroisopropyl)ether	2	FEMP FL	6.00×10^{-04}	75	309	$2.26 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	36.3
(Continued)		2071	5.00×10^{-04}	75	344	$2.09 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	37.5
		Coll 1 River	6.46×10^{-04}	75	380	$2.99 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	32.5
		Coll 2	7.50×10^{-04}	75	400	$3.65 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	30.2
	3	FEMP FL	5.00×10^{-04}	75	559	$3.40 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	9.14
		2119	4.30×10^{-04}	75	460	$2.41 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	10.8
		Strickers	3.53×10^{-04}	75	430	$1.85 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	11.9
		Coll 1 River	4.26×10^{-04}	75	430	$2.23 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	11.1
		Coll 2	7.41×10^{-04}	75	420	$3.79 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	9.38
Bromodichloromethane	1	FEMP FL	5.88×10^{-04}	75	536	$3.83 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	18.5
		2119	4.55×10^{-04}	75	490	$2.71 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	21.1
		Strickers	3.77×10^{-04}	75	443	$2.03 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	24.0
		Coll 1 River	3.86×10^{-04}	75	443	$2.08 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	23.7
		Coll 2	7.00×10^{-04}	75	443	$3.77 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	18.6
Carbazole	1	FEMP FL	7.86×10^{-04}	75	443	$4.24 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	7.17
		2119	7.00×10^{-04}	75	434	$3.70 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	7.33
		Strickers	5.87×10^{-04}	75	425	$3.04 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	7.59
		Coll 1 River	5.89×10^{-04}	75	425	$3.05 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	7.59
		Coll 2	7.31×10^{-04}	75	425	$3.78 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	7.30
		FEMP Well	1.16×10^{-03}	75	270	$3.81 \times 10^{+02}$	4.27×10^{-01}	3.68×10^{-01}	7.29

TABLE F.3.4-10 (Continued)

Constituent of Potential Concern	Source Area	Receptor	Hydraulic Gradient	Saturated GMA Thickness (ft)	Horizontal Hydraulic Conductivity (ft/day)	Horizontal Seepage Velocity (ft/yr)	Source Area Infiltration (ft/yr)	Downgradient Area Infiltration (ft/yr)	Mixing Depth (ft)
Carbazole (Continued)	2	FEMP FL	5.00×10^{-04}	75	638	$3.88 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	38.7
		2119	2.29×10^{-04}	75	519	$1.45 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	60.1
		Strickers	3.75×10^{-04}	75	487	$2.22 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	49.4
		Coll 1 River	3.83×10^{-04}	75	487	$2.27 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	48.9
		Coll 2	6.06×10^{-04}	75	487	$3.59 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	39.9
Inorganics									
Mercury	1	FEMP FL	5.36×10^{-04}	75	604	$3.94 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	30.0
		2119	4.76×10^{-04}	75	536	$3.10 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	32.9
		Strickers	4.03×10^{-04}	75	492	$2.41 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	36.6
		Coll 1 River	4.03×10^{-04}	75	485	$2.38 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	36.8
		Coll 2	6.71×10^{-04}	75	475	$3.88 \times 10^{+02}$	5.22×10^{-01}	3.68×10^{-01}	30.2
	2	FEMP FL	4.29×10^{-04}	75	638	$3.33 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	22.5
		K3	4.09×10^{-04}	75	638	$3.17 \times 10^{+02}$	6.39×10^{-01}	3.68×10^{-01}	22.9

Porosity = 0.30

TABLE F.3.5-1

HELP MODELING PARAMETERS AND RESULTS

Parameter	Zone I	Zone II	Zone III	Zone IV	Zone V	K_{sat} (cm/sec)
Layer Thickness (ft)						
Brown Clay	10	10		20		3.59×10^{-05}
Brown/Gray Sand	15					1.10×10^{-04}
Brown Clay/Sand			20		20	7.04×10^{-05}
Gray Clay	20	30	10	20		7.23×10^{-07}
Degraded Gray Clay					10	3.53×10^{-04}
Unsaturated Great Miami Aquifer	20	35	30	25	30	1.59×10^{-02}
AMC-II Runoff Curve Number	48	31	46	60	46	
Vegetative Cover Number	4.0	5.0	4.0	3.0	4.0	
Leaf Area Index	3.3	5.0	3.3	2.0	3.3	
Evaporative Zone Depth (in)	30	38	30	21	30	
Infiltration Rate (in/yr)	6.26	4.92	7.67	5.97	7.75	

TABLE F.3.5-2

RESULTS OF VADOSE ZONE TO GREAT MIAMI AQUIFER PATHWAY SCREENING

Potential COC	Initial Concentration Toxicity Screened Out	Travel Time/ Decay Screened Out	ODAST Maximum Output Toxicity Screened Out	CPC with Vadose Zone Loading
Radionuclides				
Actinium-227		X		
Cesium-137		X		
Lead-210		X		
Neptunium-237				CPC
Plutonium-238		X		
Plutonium-239/240		X		
Polonium-210		X		
Protactinium-231		X		
Radium-224		X		
Radium-226		X		
Radium-228		X		
Ruthenium-106		X		
Strontium-90				CPC
Technetium-99				CPC
Thorium-228		X		
Thorium-230		X		
Thorium-232		X		
Uranium-Total				CPC
Organics				
1,1-Dichloroethane	X			
1,1-Dichloroethene			X	
1,1,1-Trichloroethane	X			
1,1,2-Trichloroethane			X	
1,1,2,2-Tetrachloroethane		X		
1,2-Dichloroethane				CPC
1,2-Dichloroethene (tot)			X	

TABLE F.3.5-2
(Continued)

Potential COC	Initial Concentration Toxicity Screened Out	Travel Time/ Decay Screened Out	ODAST Maximum Output Toxicity Screened Out	CPC with Vadose Zone Loading
2-Butanone		X		
2-Chlorophenol			X	
2-Hexanone	X			
2-Methylnaphthalene	X			
2-Methylphenol	X			
2,4-Dichlorophenol		X		
2,4-Dimethylphenol		X		
2,4-Dinitrotoluene			X	
2,6-Dinitrotoluene			X	
3,3'-Dichlorobenzidine		X		
4-Chloro-3-methylphenol	X			
4-Methyl-2-pentanone		X		
4-Methylphenol	X			
4-Nitroaniline				CPC
4-Nitrophenol		X		
4,4'-DDE	X	X		
4,4'-DDT	X	X		
Acenaphthene	X	X		
Acenaphthylene	X	X		
Acetone		X		
Aldrin		X		
Alpha-chlordane				CPC
Anthracene	X	X		
Arochlor-1254		X		
Arochlor-1260		X		
Benzene			X	
Benzoic Acid	X	X		
Benzo(a)anthracene		X		

TABLE F.3.5-2
(Continued)

Potential COC	Initial Concentration Toxicity Screened Out	Travel Time/ Decay Screened Out	ODAST Maximum Output Toxicity Screened Out	CPC with Vadose Zone Loading
Benzo(a)pyrene		X		
Benzo(b)fluoranthene		X		
Benzo(g,h,i)perylene	X	X		
Benzo(k)fluoranthene		X		
Benzyl alcohol			X	
Beta-BHC		X		
Bis(2-chloroisopropyl)ether				CPC
Bis(2-Ethylhexyl)phthalate		X		
Bromodichloromethane				CPC
Bromomethane		X		
Butylbenzylphthalate	X	X		
Carbazole				CPC
Carbon disulfide		X		
Chlorobenzene	X	X		
Chloroform		X		
Chrysene		X		
Dibenzofuran		X		
Dibenzo(a,h)anthracene		X		
Dieldrin		X		
Diethylphthalate	X			
Di-n-butyl phthalate	X	X		
Di-n-octylphthalate	X	X		
Endosulfan II	X			
Endosulfan Sulfate	X			
Endrin Aldehyde			X	
Ethylbenzene	X	X		
Fluoranthene	X	X		
Fluorene	X	X		

TABLE F.3.5-2
(Continued)

Potential COC	Initial Concentration Toxicity Screened Out	Travel Time/ Decay Screened Out	ODAST Maximum Output Toxicity Screened Out	CPC with Vadose Zone Loading
Heptachlor Epoxide			X	
Heptachlorodibenzofurans		X		
Hexachlorobutadiene		X		
Indeno(1,2,3-cd)pyrene		X		
Isophorone		X		
Methoxychlor	X	X		
Methylene chloride		X		
Napthalene	X	X		
N-nitroso-di-n-propylamine			X	
N-nitrosodiphenylamine		X		
Octachlorodibenzofuran		X		
Octachlorodibenzo-p-dioxin	X	X		
Phenanthrene	X	X		
Phenol	X	X		
Pyrene	X	X		
Styrene		X		
Tetrachloroethene			X	
Toluene	X	X		
Tributylphosphate		X		
Trichloroethene			X	
Xylenes, Total	X	X		

TABLE F.3.5-2
(Continued)

Potential COC	Initial Concentration Toxicity Screened Out	Travel Time/ Decay Screened Out	ODAST Maximum Output Toxicity Screened Out	CPC with Vadose Zone Loading
Inorganics				
Aluminum		X		
Antimony		X		
Arsenic		X		
Barium		X		
Beryllium		X		
Boron				CPC
Cadmium		X		
Chromium		X		
Chromium (Hex)				CPC
Cobalt	X	X		
Copper		X		
Cyanide			X	
Lead		X		
Magnesium				CPC
Manganese		X		
Mercury				CPC
Molybdenum		X		
Nickel		X		
Selenium	X	X		
Silver		X		
Thallium		X		
Vanadium		X		
Zinc	X	X		

TABLE F.3.5-3

GENERAL PHYSICAL CONDITIONS OF OPERABLE UNIT 5 INFILTRATION ZONES AND CALCULATED PARAMETERS USED IN OPERABLE UNIT 5 TRAVEL TIME SCREENING

Parameter	Units	Infiltration Zone I	Infiltration Zone II	Infiltration Zone III	Infiltration Zone IV	Infiltration Zone V
Thickness Vadose 1 (L1)	(ft)	2.00×10^{1}	3.00×10^{1}	1.00×10^{1}	2.00×10^{1}	1.00×10^{1}
Thickness Vadose 2 (L2)	(ft)	2.00×10^{1}	3.50×10^{1}	3.00×10^{1}	2.50×10^{1}	3.00×10^{1}
Infiltration Rate (q)	(in/yr)	6.26×10^{0}	4.92×10^{0}	7.67×10^{0}	5.97×10^{0}	7.75×10^{0}
Hydraulic Conductivity Vadose 1 (K1)	(ft/day)	2.05×10^{-3}	2.05×10^{-3}	2.05×10^{-3}	2.05×10^{-3}	1.00×10^{0}
Hydraulic Conductivity Vadose 2 (K2)	(ft/day)	4.50×10^{1}	4.50×10^{1}	4.50×10^{1}	4.50×10^{1}	4.50×10^{1}
Velocity Vadose 1 (V1)	(ft/day)	7.247×10^{-3}	5.750×10^{-3}	8.810×10^{-3}	6.924×10^{-3}	1.133×10^{-2}
Velocity Vadose 2 (V2)	(ft/day)	1.210×10^{-2}	9.721×10^{-3}	1.456×10^{-2}	1.159×10^{-2}	1.470×10^{-2}
Brenner Vadose 1 (P1)		2.93×10^{1}	3.91×10^{1}	1.60×10^{1}	2.87×10^{1}	1.75×10^{1}
Brenner Vadose 2 (P2)		3.58×10^{1}	5.81×10^{1}	5.67×10^{1}	4.42×10^{1}	5.68×10^{1}
Brenner Multiplier Vadose 1 (M1)		5.00×10^{-1}	6.00×10^{-1}	5.00×10^{-1}	5.00×10^{-1}	5.00×10^{-1}
Brenner Multiplier Vadose 2 (M2)		6.00×10^{-1}	7.00×10^{-1}	6.00×10^{-1}	7.00×10^{-1}	7.00×10^{-1}

Formulas:

Pore Velocity $V = q^{(1-1/(2b+3))} * Ks^{(1/(2b+3))} / \text{Porosity}$
Brenner P $P = VL/4D$
Dispersion $D = 6.458 \times 10^{-4} + .14 * V^{1.11}$
Travel Time $M * t_{tm} = R1 * M1 * L1/V1 + R2 * M2 * L2/V2$
Half-Life Half Life $= Ln(2) / \lambda$
R1 = Retardation factor in Vadose Layer 1 $= 1 + (K_d \rho_b / \theta)_{Layer\ 1}$
R2 = Retardation factor in Vadose Layer 2 $= 1 + (K_d \rho_b / \theta)_{Layer\ 2}$
K_s = Hydraulic conductivity
t_m = Mean total travel time through both layers
θ = Porosity

TABLE F.3.5-4

SWIFTLOAD SCREENING RESULTS

Constituent of Potential Concern	Screening Level (mg/L)	Maximum Concentration Exiting Layer 2 (mg/L)	Mass Loading at Maximum Concentration (lb/day)	Time of Maximum (yrs)	Grid Block Location X	Grid Block Location Y	Screened Out
Radionuclides							
Neptunium-237	3.12×10^{-8}	1.490×10^{-5}	1.979×10^{-8}	360	36	95	
Strontium-90	1.02×10^{-12}	1.073×10^{-11}	1.426×10^{-14}	150	36	95	
Technetium-99	2.18×10^{-7}	1.124×10^{-2}	1.566×10^{-5}	30	47	79	
Uranium-Total	8.93×10^{-4}	$3.178 \times 10^{+1}$	5.481×10^{-2}	650	57	70	
Organics							
1,1-Dichloroethene	6.70×10^{-6}	1.885×10^{-11}	3.218×10^{-14}	10	49	61	X
1,1,2-Trichloroethane	3.20×10^{-5}	3.615×10^{-9}	6.171×10^{-12}	70	53	73	X
1,2-Dichloroethane	2.00×10^{-5}	2.516×10^{-5}	4.296×10^{-8}	20	55	72	
1,2-Dichloroethene (tot)	3.70×10^{-2}	1.179×10^{-3}	2.013×10^{-6}	20	53	73	X
2-Chlorophenol	1.80×10^{-2}	1.005×10^{-2}	1.100×10^{-5}	120	46	94	X
2,4-Dinitrotoluene	1.30×10^{-5}	5.674×10^{-13}	9.687×10^{-16}	30	59	71	X
2,6-Dinitrotoluene	1.30×10^{-5}	8.619×10^{-18}	1.471×10^{-20}	40	53	73	X
4-Nitroaniline	1.10×10^{-2}	3.776×10^{-2}	4.134×10^{-5}	50	46	94	
Alpha-chlordane	6.60×10^{-6}	2.849×10^{-4}	3.970×10^{-7}	390	55	84	
Benzene	6.20×10^{-5}	5.742×10^{-8}	9.904×10^{-11}	40	57	72	X
Benzylalcohol	$1.10 \times 10^{+0}$	3.319×10^{-2}	3.634×10^{-5}	40	55	80	X
Bis(2-chloroisopropyl)ether	4.20×10^{-5}	1.445×10^{-2}	1.582×10^{-5}	70	60	73	

TABLE F.3.5-4 (Continued)

Constituent of Potential Concern	Screening Level (mg/L)	Maximum Concentration Exiting Layer 2 (mg/L)	Mass Loading at Maximum Concentration (lb/day)	Time of Maximum (yrs)	Grid Block Location X	Grid Block Location Y	Screened Out
Bromodichloromethane	1.40×10^{-4}	1.282×10^{-2}	2.212×10^{-5}	30	57	70	
Carbazole	4.30×10^{-4}	6.343×10^{-3}	1.083×10^{-5}	530	51	69	
Endrin Aldehyde	1.10×10^{-3}	2.933×10^{-4}	3.212×10^{-7}	1000	46	94	X
Heptachlor epoxide	2.00×10^{-7}	2.226×10^{-12}	3.800×10^{-15}	70	48	65	X
N-nitroso-di-n-propylamine	1.20×10^{-6}	2.684×10^{-14}	2.939×10^{-17}	30	46	94	X
Tetrachloroethene	3.70×10^{-2}	3.265×10^{-7}	5.574×10^{-10}	80	53	73	X
Trichloroethene	2.50×10^{-4}	1.900×10^{-5}	2.524×10^{-8}	30	36	95	X
Inorganics							
Boron	3.30×10^{-1}	$3.466 \times 10^{+0}$	4.829×10^{-3}	390	49	74	
Chromium (Hex)	1.80×10^{-2}	2.628×10^{-2}	3.493×10^{-5}	260	36	95	
Cyanide	7.30×10^{-2}	2.448×10^{-2}	4.179×10^{-5}	10	53	73	X
Magnesium	$3.50 \times 10^{+1}$	$5.338 \times 10^{+3}$	$9.112 \times 10^{+0}$	470	53	73	
Mercury	1.10×10^{-3}	4.138×10^{-2}	5.765×10^{-5}	1000	46	76	

TABLE F.3.5-5

CONSTITUENTS OF POTENTIAL CONCERN AND MODELING APPROACH

Potential COC	Constituent Category	OU5 Vadose Zone Loading	Surface Water Loading	Vadose Zone Model	GMA Model
Radionucides					
Neptunium-237	PRIMARY	X	X	SWIFTLOAD	SWIFT
Plutonium-238	SECONDARY		X	NA	ECTran
Plutonium-239/240	SECONDARY		X	NA	ECTran
Radium-226	PRIMARY		X	NA	SWIFT
Strontium-90	PRIMARY	X	X	SWIFTLOAD	SWIFT
Technetium-99	PRIMARY	X	X	SWIFTLOAD	SWIFT
Thorium-230	SECONDARY		X	NA	ECTran
Thorium-232	SECONDARY		X	NA	ECTran
Uranium-Total	PRIMARY	X	X	SWIFTLOAD	SWIFT
Organics					
1,1-Dichloroethene	SECONDARY		X	NA	ECTran
1,2-Dichloroethane	SECONDARY	X		SWIFTLOAD	ECTran
3,3'-Dichlorobenzidine	SECONDARY		X	NA	ECTran
4-Methylphenol	SECONDARY		X	NA	ECTran
4-Nitroaniline	SECONDARY	X	X	SWIFTLOAD	ECTran
Alpha-chlordane	SECONDARY	X	X	SWIFTLOAD	ECTran
Arochlor-1254	SECONDARY		X	NA	ECTran
Arochlor-1260	SECONDARY		X	NA	ECTran
Benzo(a)anthracene	SECONDARY		X	NA	ECTran
Benzo(a)pyrene	SECONDARY		X	NA	ECTran

TABLE F.3-5-5 (Continued)

Potential COC	Constituent Category	OU5 Vadose Zone Loading	Surface Water Loading	Vadose Zone Model	GMA Model
Bis(2-chloroisopropyl)ether	SECONDARY	X	X	SWIFTLOAD	ECTran
Bromodichloromethane	SECONDARY	X	X	SWIFTLOAD	ECTran
Bromomethane	SECONDARY		X	NA	ECTran
Carbazole	SECONDARY	X		SWIFTLOAD	ECTran
Chloroform	SECONDARY		X	NA	ECTran
Dibenzo(a,h)anthracene	SECONDARY		X	NA	ECTran
Dieldrin	SECONDARY		X	NA	ECTran
Methylenechloride	SECONDARY		X	NA	ECTran
N-nitroso-di-n-propylamine	SECONDARY		X	NA	ECTran
Inorganics					
Antimony	PRIMARY		X	NA	SWIFT
Arsenic	PRIMARY		X	NA	SWIFT
Beryllium	PRIMARY		X	NA	SWIFT
Boron	SECONDARY	X		SWIFTLOAD	ECTran
Chromium (Hex)	PRIMARY	X		SWIFTLOAD	SWIFT
Cyanide	SECONDARY		X	NA	ECTran
Lead	SECONDARY		X	NA	ECTran
Magnesium	PRIMARY	X	X	SWIFTLOAD	SWIFT
Manganese	PRIMARY		X	NA	SWIFT
Mercury	SECONDARY	X	X	SWIFTLOAD	ECTran

TABLE F.3.5-6

HYDROGEOLOGICAL INFORMATION FOR THE ECTran MODEL SURFACE WATER AS A SOURCE

Reach/ Source Area	Receptor[a]	Infiltration Rate (ft/day)	Travel Distance (ft)	GMA Hydraulic Conductivity (ft/day)	Layer 2 Vertical Hydraulic Conductivity (ft/day)	Hydraulic Gradient (ft/ft)	Porosity	Horizontal Seepage Velocity (ft/day)	Mixing Depth (ft)
SSOD-A	12 (K1)	1.14×10^{-2}	9.30×10^{2}	6.38×10^{2}	4.50×10^{1}	6.45×10^{-4}	3.00×10^{-1}	1.37×10^{0}	2.09×10^{0}
SSOD-B	13 (K2)	1.14×10^{-2}	1.48×10^{3}	6.38×10^{2}	4.50×10^{1}	5.41×10^{-4}	3.00×10^{-1}	1.15×10^{0}	2.20×10^{0}
SSOD-C	FEMP FL-14 (K3)	1.14×10^{-2}	2.90×10^{3}	6.38×10^{2}	4.50×10^{1}	4.48×10^{-4}	3.00×10^{-1}	9.53×10^{-1}	2.35×10^{0}
SSOD-C	14 (K3)	1.14×10^{-2}	3.47×10^{3}	6.38×10^{2}	4.50×10^{1}	4.61×10^{-4}	3.00×10^{-1}	9.81×10^{-1}	2.32×10^{0}
CD-A	13 (K2)	4.02×10^{-2}	3.97×10^{3}	6.38×10^{2}	4.50×10^{1}	6.05×10^{-4}	3.00×10^{-1}	1.29×10^{0}	7.22×10^{0}
CD-B	FEMP FL-14 (K3)	4.02×10^{-2}	6.00×10^{3}	6.03×10^{2}	4.50×10^{1}	5.50×10^{-4}	3.00×10^{-1}	1.11×10^{0}	7.97×10^{0}
CD-B	14 (K3)	4.02×10^{-2}	6.70×10^{3}	6.07×10^{2}	4.50×10^{1}	5.37×10^{-4}	3.00×10^{-1}	1.09×10^{0}	8.06×10^{0}
DE-A	12 (K1)	1.89×10^{-2}	8.30×10^{2}	6.38×10^{2}	4.50×10^{1}	6.02×10^{-4}	3.00×10^{-1}	1.28×10^{0}	4.86×10^{0}
DE-B	13 (K2)	1.89×10^{-2}	2.76×10^{3}	6.38×10^{2}	4.50×10^{1}	6.52×10^{-3}	3.00×10^{-1}	1.39×10^{0}	4.67×10^{0}

[a] See Figure F.3.4-4 for receptor locations.

TABLE F.3.6-1

HYDROGEOLOGIC INFORMATION FOR THE ECTran MODEL
PERCHED WATER AS A LATERAL SOURCE

Source[a] Area	Chemical of Potential Concern	Travel Distance (ft)	Hydraulic Gradient (ft/ft)	Perched Aquifer Thickness (ft)	Horizontal Hydraulic Conductivity (ft/yr)	Horizontal Seepage Velocity (ft/yr)	Porosity	Infiltration[b] (ft/yr)
OU1 "A"	Strontium-90	1.38×10^{3}	1.38×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.24×10^{1}	3.00×10^{-1}	5.90×10^{-1}
	Technetium-99	1.38×10^{3}	1.38×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.24×10^{1}	3.00×10^{-1}	1.18×10^{0}
	Cyanide	1.38×10^{3}	1.38×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.24×10^{1}	3.00×10^{-1}	5.90×10^{-1}
	Magnesium	1.38×10^{3}	1.38×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.24×10^{1}	3.00×10^{-1}	2.36×10^{0}
	Carbazole	1.38×10^{3}	1.38×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.24×10^{1}	3.00×10^{-1}	1.89×10^{0}
	Vinyl Chloride	1.38×10^{3}	1.38×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.24×10^{1}	3.00×10^{-1}	1.68×10^{0}
OU1 "B"	Strontium-90	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	2.00×10^{0}
	Uranium-234	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	2.50×10^{0}
	Uranium-235/6	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	2.50×10^{0}
	Uranium-238	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	6.24×10^{-1}
	Cadmium	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	2.00×10^{0}
	Cyanide	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	6.24×10^{-1}
	Magnesium	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	2.50×10^{0}
	Mercury	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	6.24×10^{-1}
	Molybdenum	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	6.24×10^{-1}
	Carbazole	4.12×10^{2}	1.46×10^{-2}	1.50×10^{1}	1.14×10^{3}	5.55×10^{1}	3.00×10^{-1}	6.24×10^{-1}

TABLE F.3.6-1 (Continued)

Source[a] Area	Chemical of Potential Concern	Travel Distance (ft)	Hydraulic Gradient (ft/ft)	Perched Aquifer Thickness (ft)	Horizontal Hydraulic Conductivity (ft/yr)	Horizontal Seepage Velocity (ft/yr)	Porosity	Infiltration[b] (ft/yr)
OU4	Technetium-99	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	5.11×10^{0}
	Uranium-234	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	6.39×10^{0}
	Uranium-234	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	3.20×10^{0}
	Uranium-238	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	Antimony	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	4.26×10^{0}
	Cadmium	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	6.39×10^{0}
	Cyanide	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	Magnesium	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	1.28×10^{1}
	Manganese	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	4.56×10^{0}
	Mercury	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	Molybdenum	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	1,1,2,2-Tetrachloroethane	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	1,1,2-Trichloroethane	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	Bromoform	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	Carbazole	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}
	Trichloroethene	3.20×10^{2}	3.75×10^{-2}	1.50×10^{1}	1.14×10^{3}	1.42×10^{2}	3.00×10^{-1}	2.13×10^{0}

TABLE F.3.6-1 (Continued)

Source[a] Area	Chemical of Potential Concern	Travel Distance (ft)	Hydraulic Gradient (ft/ft)	Perched Aquifer Thickness (ft)	Horizontal Hydraulic Conductivity (ft/yr)	Horizontal Seepage Velocity (ft/yr)	Porosity	Infiltration[b] (ft/yr)
Pilot Plant	Technetium-99	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	6.41×10^{-1}
	Uranium-234	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	1.60×10^{-1}
	Uranium-235/6	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	2.00×10^{-1}
	Uranium-238	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	2.00×10^{-1}
	1,1-Dichloroethane	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	2.00×10^{-1}
	1,1-Dichloroethene	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	8.01×10^{-1}
	Tetrachloroethene	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	8.01×10^{-1}
	Trichloroethene	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	8.01×10^{-1}
	Carbazole	5.50×10^{2}	4.70×10^{-3}	1.50×10^{1}	1.14×10^{3}	1.78×10^{1}	3.00×10^{-1}	2.00×10^{-1}
Plant 2/3	Technetium-99	1.47×10^{3}	5.40×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.05×10^{1}	3.00×10^{-1}	2.31×10^{-1}
	Uranium-234	1.47×10^{3}	5.40×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.05×10^{1}	3.00×10^{-1}	2.31×10^{-1}
	Uranium-235/6	1.47×10^{3}	5.40×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.05×10^{1}	3.00×10^{-1}	2.31×10^{-1}
	Uranium-238	1.47×10^{3}	5.40×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.05×10^{1}	3.00×10^{-1}	2.31×10^{-1}
	Cyanide	1.47×10^{3}	5.40×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.05×10^{1}	3.00×10^{-1}	2.31×10^{-1}

TABLE F.3.6-1 (Continued)

Source[a] Area	Chemical of Potential Concern	Travel Distance (ft)	Hydraulic Gradient (ft/ft)	Perched Aquifer Thickness (ft)	Horizontal Hydraulic Conductivity (ft/yr)	Horizontal Seepage Velocity (ft/yr)	Porosity	Infiltration[b] (ft/yr)
Laboratory	Technetium-99	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	7.52×10^{-1}
	Uranium-234	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	3.14×10^{-1}
	Uranium-235/6	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	4.70×10^{-1}
	Uranium-238	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	2.35×10^{-1}
	Cyanide	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	2.35×10^{-1}
	Magnesium	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	4.70×10^{-1}
	1,1-Dichloroethene	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	2.35×10^{-1}
	Carbazole	6.40×10^{2}	5.50×10^{-3}	1.50×10^{1}	1.14×10^{3}	2.09×10^{1}	3.00×10^{-1}	2.35×10^{-1}

[a]See Figure F.3.6-4 for Source Area locations

[b]Infiltration rate assumed to be equal to upgradient perched groundwater flow. Calculated for each CPC based on the source area length (L) and width (W), aquifer thickness (H), porosity (Θ), and horizontal seepage velocity (Vs), using the following formula:

$$i = \frac{V_s * W * H * \theta}{L * W}$$

NA indicates Not Applicable. No CPCs at site were detected in perched water at site, or CPCs screened out due to chemical decay.

TABLE F.3.6-2

SUMMARY OF PERCHED WATER PLUME CHARACTERISTICS
PERCHED WATER AS A LATERAL SOURCE

Source[a] Area	Constituent of Potential Concern	Average Perched Water Plume Concentration (ug/L)	Length (ft)	Width (ft)	Perched Aquifer Thickness (ft)	Estimated Mass of Contaminant in Plume Liquid (kg)	Estimated Mass of Contaminant in Plume Soil (kg)
OU1 "A"	Strontium-90	3.87×10^{-8}	400	150	15	2.96×10^{-10}	3.07×10^{-9}
	Technetium-99	6.29×10^{-2}	200	140	15	2.25×10^{-4}	6.53×10^{5}
	Cyanide	1.50×10^{1}	400	400	15	3.06×10^{-1}	2.35×10^{-2}
	Magnesium	1.62×10^{5}	100	100	15	2.06×10^{2}	3.86×10^{3}
	Carbazole	7.04×10^{0}	125	125	15	1.40×10^{-2}	1.19×10^{-1}
	Vinyl Chloride	2.00×10^{0}	140	100	15	3.57×10^{-3}	6.18×10^{-5}
OU1 "B"	Strontium-90	9.63×10^{-9}	125	125	15	1.92×10^{-11}	1.99×10^{-10}
	Uranium-234	1.11×10^{-3}	100	100	15	1.41×10^{-6}	8.81×10^{-5}
	Uranium-235/6	2.06×10^{0}	100	100	15	2.62×10^{-3}	1.64×10^{-1}
	Uraniun-238	3.07×10^{2}	400	400	15	6.26×10^{0}	3.90×10^{2}
	Cadmium	4.92×10^{2}	125	125	15	9.80×10^{-1}	4.88×10^{1}
	Cyanide	7.94×10^{1}	400	400	15	1.62×10^{0}	1.24×10^{-1}
	Magnesium	5.76×10^{4}	100	150	15	1.10×10^{2}	2.06×10^{3}
	Mercury	2.00×10^{0}	400	400	15	4.08×10^{-2}	1.69×10^{0}
	Molybdenum	3.94×10^{4}	400	400	15	8.03×10^{2}	3.34×10^{4}
	Carbazole	7.04×10^{0}	400	400	15	1.44×10^{-1}	1.22×10^{0}

TABLE F.3.6-2 (Continued)

Source[a] Area	Constituent of Potential Concern	Average Perched Water Plume Concentration (ug/L)	Length (ft)	Width (ft)	Perched Aquifer Thickness (ft)	Estimated Mass of Contaminant in Plume Liquid (kg)	Estimated Mass of Contaminant in Plume Soil (kg)
OU4 Area	Technetium-99	1.18×10^{-3}	125	125	15	2.35×10^{-6}	6.84×10^{-7}
	Uranium-234	1.14×10^{-3}	100	200	15	2.91×10^{-6}	1.81×10^{-4}
	Uranium-235/6	2.82×10^{-1}	200	200	15	1.44×10^{-3}	8.97×10^{-2}
	Uranium-238	2.44×10^{1}	300	300	15	2.80×10^{-1}	1.74×10^{1}
	Antimony	1.29×10^{5}	150	200	15	4.93×10^{2}	9.22×10^{4}
	Cadmium	1.18×10^{4}	100	200	15	3.01×10^{1}	1.50×10^{3}
	Cyanide	1.20×10^{1}	300	300	15	1.38×10^{-1}	1.06×10^{-2}
	Magnesium	5.88×10^{4}	50	300	15	1.12×10^{2}	2.10×10^{3}
	Manganese	5.10×10^{2}	140	260	15	2.37×10^{0}	4.91×10^{2}
	Mercury	2.00×10^{0}	300	300	15	2.29×10^{-2}	9.53×10^{-1}
	Molybdenum	3.30×10^{1}	300	300	15	3.78×10^{-1}	1.57×10^{1}
	1,1,2,2-Tetrachloroethane	5.00×10^{0}	300	300	15	5.73×10^{-2}	6.12×10^{-2}
	1,1,2-Trichloroethane	2.00×10^{0}	300	300	15	2.29×10^{-2}	2.94×10^{-2}
	Bromoform	2.00×10^{0}	300	300	15	2.29×10^{-2}	2.94×10^{-2}
	Carbazole	7.04×10^{0}	300	300	15	8.07×10^{-2}	6.84×10^{-1}
	Trichloroethene	3.19×10^{0}	300	300	15	3.66×10^{-2}	5.39×10^{-2}

TABLE F.3.6-2 (Continued)

Source[a] Area	Constituent of Potential Concern	Average Perched Water Plume Concentration (ug/L)	Length (ft)	Width (ft)	Perched Aquifer Thickness (ft)	Estimated Mass of Contaminant in Plume Liquid (kg)	Estimated Mass of Contaminant in Plume Soil (kg)
Pilot Plant	Technetium-99	5.86×10^{-4}	125	125	15	1.17×10^{-6}	3.39×10^{-7}
	Uranium-234	7.35×10^{-3}	500	250	15	1.17×10^{-4}	7.29×10^{-3}
	Uranium-235/6	2.04×10^{0}	400	400	15	4.15×10^{-2}	2.59×10^{0}
	Uranium-238	1.32×10^{2}	400	400	15	2.69×10^{0}	1.67×10^{2}
	1,2-Dichloroethene	6.80×10^{1}	100	150	15	1.30×10^{-1}	1.71×10^{-2}
	1,1-Dichloroethane	1.00×10^{2}	400	400	15	2.04×10^{0}	5.46×10^{-1}
	1,1-Dichloroethene	4.00×10^{0}	400	400	15	8.16×10^{-2}	1.07×10^{-2}
	Carbazole	6.85×10^{0}	400	400	15	1.40×10^{-1}	1.18×10^{0}
	Tetrachloroethene	4.90×10^{1}	100	150	15	9.37×10^{-2}	1.38×10^{-1}
	Trichloroethene	5.30×10^{1}	100	150	15	1.01×10^{-1}	1.49×10^{-1}
Plant 2/3	Technetium-99	1.22×10^{-1}	400	400	15	2.48×10^{-3}	7.22×10^{-4}
	Uranium-234	3.71×10^{0}	400	400	15	7.57×10^{-2}	4.72×10^{0}
	Uranium-235/6	8.56×10^{2}	400	400	15	1.75×10^{1}	1.09×10^{3}
	Uranium-238	5.45×10^{4}	400	400	15	1.11×10^{3}	6.92×10^{4}
	Cyanide	4.00×10^{0}	400	400	15	8.16×10^{-2}	6.27×10^{-3}

TABLE F.3.6-2 (Continued)

Source[a] Area	Constituent of Potential Concern	Average Perched Water Plume Concentration (ug/L)	Length (ft)	Width (ft)	Perched Aquifer Thickness (ft)	Estimated Mass of Contaminant in Plume Liquid (kg)	Estimated Mass of Contaminant in Plume Soil (kg)
Laboratory	Technetium-99	5.86×10^{-4}	125	125	15	1.17×10^{-6}	3.39×10^{-7}
	Uranium-234	4.07×10^{-2}	300	300	15	4.66×10^{-4}	2.91×10^{-2}
	Uranium-235/6	7.92×10^{0}	200	100	15	2.02×10^{-2}	1.26×10^{0}
	Uranium-238	5.12×10^{2}	400	400	15	1.04×10^{1}	6.50×10^{2}
	Cyanide	2.87×10^{4}	400	400	15	5.85×10^{2}	4.50×10^{1}
	Magnesium	7.60×10^{4}	200	420	15	8.13×10^{2}	1.52×10^{4}
	Carbazole	6.85×10^{0}	400	400	15	1.40×10^{-1}	1.18×10^{0}
	1,1-Dichloroethene	2.40×10^{1}	400	400	15	4.89×10^{-1}	6.42×10^{-2}

[a]See Figure F.3.6-4 for source area locations.

TABLE F.3.7-1

CONSTITUENTS OF POTENTIAL CONCERN IN THE GROUNDWATER PATHWAY AND MODELING APPROACHES

Potential COC	Level of Concern	ODAST/ SWIFTLOAD	ECTran	SWIFT
Radionuclides				
Neptunium-237	Primary	X		X
Plutonium-238	Secondary		X	
Plutonium-239/240	Secondary		X	
Radium-226	Primary			X
Strontium-90	Primary	X		X
Technetium-99	Primary	X		X
Thorium-230	Secondary		X	
Thorium-232	Secondary		X	
Uranium-Total	Primary	X		X
Organics				
1,1-Dichloroethene	Secondary		X	
1,2-Dichloroethane	Secondary	X	X	
3,3'-Dichlorobenzidine	Secondary		X	
4-Methylphenol	Secondary		X	
4-Nitroaniline	Secondary	X	X	
Alpha-chlordane	Secondary	X	X	
Arochlor-1254	Secondary		X	
Arochlor-1260	Secondary		X	
Benzo(a)anthracene	Secondary		X	
Benzo(a)pyrene	Secondary		X	

TABLE F.3.7-1 (Continued)

Potential COC	Level of Concern	ODAST/ SWIFTLOAD	ECTran	SWIFT
Bis(2-chloroisopropyl)ether	Secondary	X	X	
Bromodichloromethane	Secondary	X	X	
Bromomethane	Secondary		X	
Carbazole	Secondary	X	X	
Chloroform	Secondary		X	
Dibenzo(a,h)anthracene	Secondary		X	
Dieldrin	Secondary		X	
Methylene chloride	Secondary		X	
N-nitroso-di-n-propylamine	Secondary		X	
Inorganics				
Antimony	Primary			X
Arsenic	Primary			X
Beryllium	Primary			X
Boron	Secondary	X	X	
Chromium (Hex)	Primary	X		X
Cyanide	Secondary		X	
Lead	Secondary		X	
Magnesium	Primary	X		X
Manganese	Primary			X
Mercury	Secondary	X	X	

TABLE F.3.7-2

SUMMARY OF TIMES, LOCATIONS, AND MAXIMUM MASS LOADING FOR CONSTITUENTS OF POTENTIAL CONCERN TO THE GREAT MIAMI AQUIFER

Constituent of Potential Concern	Mass Loading at Maximum Concentration (lbs/day)	Time of Maximum Concentration (Years)	Grid Block Location x,y
Radionuclides			
Neptunium-237	1.979×10^{-08}	360	36,95
Radium-226	0.000	NA	NA
Strontium-90	1.426×10^{-14}	150	36,95
Technetium-99	1.566×10^{-05}	30	47,79
Uranium-Total	5.481×10^{-02}	650	57,70
Organics			
1,1-Dichloroethane	2.098×10^{-09}	10	36,95
1,1-Dichloroethene	3.218×10^{-14}	10	49,61
1,1,1-Trichloroethane	7.900×10^{-10}	20	36,95
1,1,2-Trichloroethane	6.171×10^{-12}	70	53,73
1,2-Dichloroethane	4.296×10^{-08}	20	55,72
1,2-Dichloroethene (tot)	2.013×10^{-06}	20	53,73
2-Chlorophenol	1.100×10^{-05}	120	46,94
2-Hexanone	8.137×10^{-06}	20	57,73
2-Methylnaphthalene	1.578×10^{-05}	490	36,95
2-Methylphenol	1.827×10^{-05}	60	60,73
2,4-Dinitrotoluene	9.687×10^{-16}	30	59,71
2,6-Dinitrotoluene	1.471×10^{-20}	40	53,73
4-Chloro-3-methylphenol	1.758×10^{-05}	340	57,70
4-Methylphenol	2.131×10^{-04}	40	30,52
4-Nitroaniline	4.134×10^{-05}	50	46,94
Alpha-chlordane	3.970×10^{-07}	390	55,84
Benzene	9.904×10^{-11}	40	57,72
Benzyl alcohol	3.634×10^{-05}	40	55,80
Bis(2-chloroisopropyl)ether	1.582×10^{-05}	70	60,73
Bromodichloromethane	2.212×10^{-05}	30	57,70

TABLE F.3.7-2
(Continued)

Constituent of Potential Concern	Mass Loading at Maximum Concentration (lbs/day)	Time of Maximum Concentration (Years)	Grid Block Location x,y
Carbazole	1.083×10^{-05}	530	51,69
Diethylphthalate	7.147×10^{-21}	20	30,71
Endosulfan II	1.880×10^{-28}	1000	55,84
Endosulfan Sulfate	1.275×10^{-33}	1000	55,84
Endrin Aldehyde	3.212×10^{-07}	1000	46,94
Heptachlor Epoxide	3.800×10^{-15}	70	48,65
N-nitroso-di-n-propylamine	2.939×10^{-17}	30	46,94
Tetrachloroethene	5.574×10^{-10}	80	53,73
Trichloroethene	2.524×10^{-08}	30	36,95
Inorganics			
Antimony	7.388×10^{-20}	1000	36,95
Arsenic	0.000	NA	NA
Barium	8.012×10^{-06}	1000	36,95
Boron	4.829×10^{-03}	390	49,74
Chromium (Hex)	3.493×10^{-05}	260	36,95
Cyanide	4.179×10^{-05}	10	53,73
Magnesium	$9.112 \times 10^{+00}$	470	53,73
Manganese	3.456×10^{-22}	1000	36,95
Mercury	5.765×10^{-05}	1000	46,76
Molybdenum	3.597×10^{-05}	690	36,95
Thallium	0.000	NA	NA

TABLE F.3.7-3

SUMMARY OF TIME, LOCATION, AND MAXIMUM CONCENTRATIONS OF PRIMARY CONSTITUENTS OF CONCERN IN THE GMA - ON SITE AND OFF SITE

Constituent of Potential Concern	On-Property Maximum Concentration (ppb)	On-Property Maximum Time (Yr)	On-Property Fenceline Maximum[a] Concentration (ppb)	On-Property Fenceline Maximum[a] Time (Yr)
Radionuclides				
Neptunium-237	8.66×10^{-04}	910	2.48×10^{-04}	850
Plutonium-238	3.68×10^{-08}	600	8.06×10^{-15}	860
Plutonium-239/240	1.27×10^{-05}	960	2.77×10^{-11}	1000
Radium-226	1.62×10^{-05}	1000	1.78×10^{-06}	1000
Strontium-90	9.89×10^{-08}	70	1.45×10^{-08}	70
Technetium-99	4.01×10^{-01}	90	8.67×10^{-02}	100
Thorium-230	1.57×10^{-04}	1000	2.44×10^{-53}	1000
Thorium-232	$2.23 \times 10^{+00}$	1000	3.52×10^{-49}	1000
Uranium-Total	$9.06 \times 10^{+03}$	1000	$1.76 \times 10^{+03}$	260
Inorganics				
Antimony	$4.65 \times 10^{+01}$	10	$1.56 \times 10^{+00}$	110
Arsenic	$1.36 \times 10^{+02}$	10	$1.36 \times 10^{+02}$	10
Beryllium	1.19×10^{-01}	1000	$2.40 \times 10^{+02}$	1000
Chromium (hex)	$1.07 \times 10^{+01}$	1000	$3.10 \times 10^{+00}$	1000
Cyanide	$6.36 \times 10^{+03}$	20	$9.74 \times 10^{+02}$	40
Lead	$2.44 \times 10^{+02}$	1000	1.23×10^{-01}	780
Magnesium	$1.35 \times 10^{+06}$	520	$4.75 \times 10^{+05}$	880
Manganese	$2.38 \times 10^{+03}$	10	$4.43 \times 10^{+02}$	10
Mercury	$9.55 \times 10^{+00}$	1000	6.15×10^{-03}	720
Organics				
Alpha-chlordane	1.47×10^{-01}	60	1.95×10^{-02}	60
Aroclor-1254	5.66×10^{-02}	1000	3.14×10^{-25}	1000
Aroclor-1260	1.48×10^{-02}	1000	8.18×10^{-29}	1000
Benzene	1.33×10^{-01}	20	1.16×10^{-04}	60
Benzo(a)anthracene	7.31×10^{-04}	60	2.82×10^{-46}	580
Benzo(a)pyrene	3.64×10^{-06}	100	2.47×10^{-52}	680
Bis(2-chloroisopropyl)ether	$6.25 \times 10^{+00}$	40	$1.07 \times 10^{+00}$	100
Bromodichloromethane	$1.95 \times 10^{+00}$	40	9.91×10^{-01}	60
Bromomethane	$3.80 \times 10^{+01}$	20	3.95×10^{-03}	40
Carbazole	$2.38 \times 10^{+00}$	520	1.60×10^{-01}	600
Chloroform	7.87×10^{-01}	20	9.05×10^{-03}	40
Dibenzo(a,h)anthracene	1.48×10^{-05}	100	1.57×10^{-45}	740
3,3-Dichlorobenzidine	2.53×10^{-02}	20	8.32×10^{-17}	60
1,1-Dichloroethene	$2.92 \times 10^{+00}$	20	4.90×10^{-02}	40
Dieldrin	4.86×10^{-03}	60	5.94×10^{-14}	200
Methylene Chloride	$2.87 \times 10^{+01}$	20	7.15×10^{-08}	40
4-Methylphenol	$1.62 \times 10^{+03}$	20	$3.43 \times 10^{+02}$	40
4-Nitroaniline	$1.22 \times 10^{+01}$	20	4.50×10^{-01}	80
N-nitroso-di-n-propylamine	$1.06 \times 10^{+00}$	20	4.17×10^{-04}	40

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	FEMP Production Well (43,75,1)[b] Concentration (ppb)	Time (Yr)	FEMP Production Well (43,75,5)[b] Concentration (ppb)	Time (Yr)
Radionuclides				
Neptunium-237	3.57×10^{-05}	550	2.17×10^{-05}	630
Plutonium-238	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA
Radium-226	1.58×10^{-08}	1000	1.52×10^{-08}	1000
Strontium-90	4.65×10^{-10}	90	1.25×10^{-10}	100
Technetium-99	8.84×10^{-03}	40	1.57×10^{-03}	90
Thorium-230	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA
Uranium-Total	$1.16 \times 10^{+01}$	30	$3.29 \times 10^{+00}$	270
Inorganics				
Antimony	1.49×10^{-05}	160	3.08×10^{-08}	1000
Arsenic	1.68×10^{-01}	1000	8.03×10^{-02}	1000
Beryllium	$5.47 \times 10^{+01}$	1000	$2.20 \times 10^{+02}$	1000
Chromium (hex)	1.11×10^{-01}	410	7.02×10^{-02}	530
Cyanide	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Magnesium	$4.12 \times 10^{+04}$	700	$1.31 \times 10^{+05}$	750
Manganese	7.45×10^{-01}	1000	1.85×10^{-01}	10
Mercury	NA	NA	NA	NA
Organics				
Alpha-chlordane	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA
Benzene	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA
Carbazole	1.78×10^{-02}	220	NA	NA
Chloroform	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA
3,3-Dichlorobenzidine	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	Well 12 (28,46,1)[b] Concentration (ppb)	Well 12 (28,46,1)[b] Time (Yr)	Well 26 (28,46,2)[b] Concentration (ppb)	Well 26 (28,46,2)[b] Time (Yr)	Well 13 (39,44,1)[b] Concentration (ppb)	Well 13 (39,44,1)[b] Time (Yr)
Radionuclides						
Neptunium-237	1.99×10^{-04}	690	1.54×10^{-04}	490	2.48×10^{-04}	850
Plutonium-238	8.06×10^{-15}	860	NA	NA	3.38×10^{-18}	1000
Plutonium-239/240	2.77×10^{-11}	1000	NA	NA	3.72×10^{-14}	1000
Radium-226	1.78×10^{-06}	1000	6.18×10^{-07}	1000	3.60×10^{-07}	1000
Strontium-90	1.45×10^{-08}	70	6.68×10^{-09}	70	7.32×10^{-09}	70
Technetium-99	7.71×10^{-02}	100	5.06×10^{-02}	100	8.67×10^{-02}	100
Thorium-230	2.44×10^{-53}	1000	NA	NA	0.00	0
Thorium-232	3.53×10^{-49}	1000	NA	NA	0.00	0
Uranium-Total	$1.40 \times 10^{+03}$	180	$7.45 \times 10^{+02}$	270	$1.76 \times 10^{+03}$	260
Inorganics						
Antimony	3.31×10^{-01}	1000	5.23×10^{-02}	1000	1.29×10^{-03}	1000
Arsenic	$3.88 \times 10^{+00}$	1000	$2.40 \times 10^{+00}$	1000	$4.32 \times 10^{+00}$	1000
Beryllium	$2.40 \times 10^{+02}$	1000	$1.46 \times 10^{+02}$	1000	$2.17 \times 10^{+02}$	1000
Chromium (hex)	$2.01 \times 10^{+00}$	990	$1.28 \times 10^{+00}$	1000	$3.10 \times 10^{+00}$	1000
Cyanide	$9.74 \times 10^{+02}$	40	NA	NA	$6.68 \times 10^{+02}$	40
Lead	1.23×10^{-01}	780	NA	NA	2.92×10^{-03}	1000
Magnesium	$2.03 \times 10^{+05}$	410	$1.33 \times 10^{+05}$	450	$3.51 \times 10^{+05}$	470
Manganese	$4.85 \times 10^{+00}$	1000	$1.58 \times 10^{+00}$	1000	$2.74 \times 10^{+00}$	1000
Mercury	NA	NA	NA	NA	NA	NA
Organics						
Alpha-chlordane	1.95×10^{-02}	60	NA	NA	1.18×10^{-02}	80
Aroclor-1254	3.14×10^{-25}	1000	NA	NA	2.03×10^{-38}	1000
Aroclor-1260	8.18×10^{-29}	1000	NA	NA	2.42×10^{-44}	1000
Benzene	NA	NA	NA	NA	1.16×10^{-04}	60
Benzo(a)anthracene	NA	NA	NA	NA	2.82×10^{-46}	580
Benzo(a)pyrene	2.47×10^{-52}	680	NA	NA	6.62×10^{-71}	880
Bis(2-chloroisopropyl)ether	9.29×10^{-01}	40	NA	NA	6.22×10^{-01}	60
Bromodichloromethane	5.51×10^{-02}	40	NA	NA	1.42×10^{-02}	60
Bromomethane	3.95×10^{-03}	40	NA	NA	2.05×10^{-05}	40
Carbazole	NA	NA	NA	NA	NA	NA
Chloroform	9.05×10^{-03}	40	NA	NA	4.34×10^{-05}	40
Dibenzo(a,h)anthracene	1.57×10^{-45}	740	NA	NA	9.35×10^{-52}	980
3,3-Dichlorobenzidine	NA	NA	NA	NA	8.32×10^{-17}	60
1,1-Dichloroethene	4.90×10^{-02}	40	NA	NA	3.92×10^{-03}	40
Dieldrin	NA	NA	NA	NA	5.94×10^{-14}	200
Methylene Chloride	NA	NA	NA	NA	7.15×10^{-08}	40
4-Methylphenol	$2.43 \times 10^{+02}$	40	NA	NA	$1.65 \times 10^{+02}$	40
4-Nitroaniline	NA	NA	NA	NA	4.50×10^{-01}	80
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	4.17×10^{-04}	40

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	Well 14 (59,38,1)[b] Concentration (ppb)	Well 14 (59,38,1)[b] Time (Yr)	Well 34 (5,11,1)[b] Concentration (ppb)	Well 34 (5,11,1)[b] Time (Yr)	Well 2071 (85,66,1)[b] Concentration (ppb)	Well 2071 (85,66,1)[b] Time (Yr)
Radionuclides						
Neptunium-237	1.11×10^{-04}	990	9.47×10^{-05}	10	2.10×10^{-06}	1000
Plutonium-238	9.09×10^{-26}	1000	NA	NA	NA	NA
Plutonium-239/240	5.28×10^{-21}	1000	NA	NA	NA	NA
Radium-226	1.23×10^{-08}	390	3.78×10^{-09}	500	3.08×10^{-15}	1000
Strontium-90	1.32×10^{-10}	160	2.80×10^{-13}	170	3.61×10^{-14}	240
Technetium-99	4.07×10^{-02}	110	6.51×10^{-05}	140	4.43×10^{-03}	80
Thorium-230	0.00	0	NA	NA	NA	NA
Thorium-232	0.00	0	NA	NA	NA	NA
Uranium-Total	$8.73 \times 10^{+02}$	990	9.92×10^{-01}	940	$6.21 \times 10^{+01}$	200
Inorganics						
Antimony	1.29×10^{-13}	1000	4.46×10^{-01}	140	8.75×10^{-13}	1000
Arsenic	4.06×10^{-01}	1000	8.05×10^{-04}	870	1.43×10^{-06}	1000
Beryllium	$2.74 \times 10^{+00}$	1000	$1.49 \times 10^{+00}$	1000	$4.87 \times 10^{+00}$	80
Chromium (hex)	$1.13 \times 10^{+00}$	1000	1.63×10^{-03}	1000	5.53×10^{-03}	820
Cyanide	$2.73 \times 10^{+02}$	60	NA	NA	NA	NA
Lead	2.37×10^{-07}	1000	NA	NA	NA	NA
Magnesium	$2.33 \times 10^{+05}$	810	$1.70 \times 10^{+02}$	1000	$1.42 \times 10^{+04}$	1000
Manganese	9.27×10^{-01}	500	1.21×10^{-02}	1000	3.87×10^{-02}	1000
Mercury	2.20×10^{-03}	760	NA	NA	NA	NA
Organics						
Alpha-chlordane	3.14×10^{-03}	160	NA	NA	3.05×10^{-03}	480
Aroclor-1254	0.00	0	NA	NA	NA	NA
Aroclor-1260	0.00	0	NA	NA	NA	NA
Benzene	4.68×10^{-06}	60	NA	NA	NA	NA
Benzo(a)anthracene	1.06×10^{-74}	940	NA	NA	NA	NA
Benzo(a)pyrene	4.25×10^{-116}	1000	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	2.33×10^{-01}	80	NA	NA	1.27×10^{-01}	140
Bromodichloromethane	NA	NA	NA	NA	NA	NA
Bromomethane	2.53×10^{-10}	40	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.96×10^{-103}	1000	NA	NA	NA	NA
3,3-Dichlorobenzidine	2.29×10^{-23}	80	NA	NA	NA	NA
1,1-Dichloroethene	1.51×10^{-05}	40	NA	NA	NA	NA
Dieldrin	1.96×10^{-19}	240	NA	NA	NA	NA
Methylene Chloride	1.26×10^{-13}	40	NA	NA	NA	NA
4-Methylphenol	$6.42 \times 10^{+01}$	80	NA	NA	NA	NA
4-Nitroaniline	2.29×10^{-01}	100	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	1.09×10^{-05}	40	NA	NA	NA	NA

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	Well 2119 (73,52,1)[b] Concentration (ppb)	Well 2119 (73,52,1)[b] Time (Yr)	Well 2127 (5,6,1)[b] Concentration (ppb)	Well 2127 (5,6,1)[b] Time (Yr)	SOWC COLL1 (101,38,1)[b] Concentration (ppb)	SOWC COLL1 (101,38,1)[b] Time (Yr)
Radionuclides						
Neptunium-237	2.09×10^{-05}	1000	2.47×10^{-05}	10	3.84×10^{-07}	1000
Plutonium-238	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA
Radium-226	9.94×10^{-07}	10	3.67×10^{-08}	450	7.74×10^{-18}	1000
Strontium-90	4.61×10^{-12}	210	2.75×10^{-12}	170	2.18×10^{-15}	360
Technetium-99	1.14×10^{-02}	60	6.86×10^{-04}	150	2.68×10^{-04}	130
Thorium-230	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA
Uranium-Total	$2.04 \times 10^{+02}$	940	$1.06 \times 10^{+01}$	850	$5.97 \times 10^{+00}$	1000
Inorganics						
Antimony	1.94×10^{-14}	1000	$3.70 \times 10^{+00}$	70	1.48×10^{-21}	1000
Arsenic	1.12×10^{-02}	1000	7.55×10^{-03}	800	2.51×10^{-09}	160
Beryllium	$1.06 \times 10^{+00}$	1000	$1.42 \times 10^{+01}$	1000	9.16×10^{-01}	180
Chromium (hex)	1.39×10^{-01}	1000	1.73×10^{-02}	1000	6.08×10^{-03}	1000
Cyanide	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	$5.03 \times 10^{+04}$	1000	$1.80 \times 10^{+03}$	1000	$4.96 \times 10^{+02}$	1000
Manganese	1.26×10^{-01}	1000	1.84×10^{-01}	1000	9.81×10^{-04}	220
Mercury	1.86×10^{-06}	1000	NA	NA	9.44×10^{-11}	1000
Organics						
Alpha-chlordane	3.07×10^{-03}	480	NA	NA	2.65×10^{-03}	500
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	3.94×10^{-01}	100	NA	NA	1.73×10^{-01}	120
Bromodichloromethane	4.29×10^{-01}	60	NA	NA	1.86×10^{-01}	80
Bromomethane	NA	NA	NA	NA	NA	NA
Carbazole	9.94×10^{-03}	720	NA	NA	3.87×10^{-03}	740
Chloroform	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA
3,3-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	SOWC COLL1 (101,38,5)[b] Concentration (ppb)	Time (Yr)	SOWC COLL2 (108,52,1)[b] Concentration (ppb)	Time (Yr)	SOWC COLL2 (108,52,5)[b] Concentration (ppb)	Time (Yr)
Radionuclides						
Neptunium-237	5.61×10^{-07}	1000	2.00×10^{-06}	1000	2.79×10^{-06}	1000
Plutonium-238	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA
Radium-226	1.03×10^{-17}	1000	4.29×10^{-16}	1000	6.02×10^{-16}	1000
Strontium-90	3.12×10^{-15}	370	1.53×10^{-14}	320	2.11×10^{-14}	320
Technetium-99	4.01×10^{-04}	130	2.29×10^{-03}	80	3.12×10^{-03}	80
Thorium-230	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA
Uranium-Total	$1.00 \times 10^{+03}$	1000	$4.66 \times 10^{+01}$	1000	$6.44 \times 10^{+01}$	1000
Inorganics						
Antimony	2.29×10^{-21}	1000	1.36×10^{-21}	1000	1.94×10^{-21}	1000
Arsenic	3.47×10^{-09}	170	8.54×10^{-08}	180	1.08×10^{-07}	200
Beryllium	$1.28 \times 10^{+00}$	190	$5.27 \times 10^{+00}$	200	$7.81 \times 10^{+00}$	210
Chromium (hex)	9.06×10^{-03}	1000	1.57×10^{-02}	1000	2.23×10^{-02}	1000
Cyanide	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	$7.22 \times 10^{+02}$	1000	$6.46 \times 10^{+03}$	1000	$8.81 \times 10^{+03}$	1000
Manganese	1.17×10^{-03}	220	6.33×10^{-03}	280	8.00×10^{-03}	270
Mercury	NA	NA	3.93×10^{-08}	1000	NA	NA
Organics						
Alpha-chlordane	NA	NA	1.43×10^{-03}	480	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	NA	NA	1.88×10^{-01}	120	NA	NA
Bromodichloromethane	NA	NA	1.52×10^{-01}	80	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	3.45×10^{-03}	720	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA
3,3-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	STRICKERS GROVE WELL		N.E. Receptor (90,91,1)[b]	
	Concentration	Time	Concentration	Time
Radionuclides				
Neptunium-237	9.69×10^{-06}	1000	2.74×10^{-08}	1000
Plutonium-238	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA
Radium-226	2.72×10^{-15}	1000	6.06×10^{-21}	1000
Strontium-90	8.69×10^{-14}	350	4.19×10^{-18}	380
Technetium-99	5.58×10^{-03}	120	0.00	0
Thorium-230	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA
Uranium-Total	$1.24 \times 10^{+02}$	1000	4.90×10^{-02}	240
Inorganics				
Antimony	9.97×10^{-22}	1000	0.00	1000
Arsenic	6.76×10^{-07}	80	9.69×10^{-15}	0
Beryllium	3.34×10^{-02}	80	2.67×10^{-05}	80
Chromium (hex)	1.34×10^{-01}	1000	7.29×10^{-05}	900
Cyanide	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Magnesium	$1.30 \times 10^{+04}$	1000	$5.37 \times 10^{+02}$	1000
Manganese	4.40×10^{-03}	510	5.55×10^{-04}	1000
Mercury	4.30×10^{-10}	1000	NA	NA
Organics				
Alpha-chlordane	3.09×10^{-03}	500	NA	NA
Aroclor-1254	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA
Benzene	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	1.62×10^{-01}	120	NA	NA
Bromodichloromethane	2.17×10^{-01}	80	NA	NA
Bromomethane	NA	NA	NA	NA
Carbazole	4.85×10^{-03}	720	NA	NA
Chloroform	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA
3,3-Dichlorobenzidine	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	Zone 1 Max Conc. (ppb)	Zone 1 Time (Yr)	Zone 2 Max Conc. (ppb)	Zone 2 Time (Yr)	Zone 3 Max. Conc. (ppb)	Zone 3 Time (Yr)
Radionuclides						
Neptunium-237	3.57×10^{-04}	230	6.74×10^{-04}	750	8.25×10^{-05}	540
Plutonium-238	N/A	N/A	N/A	N/A	N/A	N/A
Plutonium-239/240	N/A	N/A	N/A	N/A	N/A	N/A
Radium-226	1.21×10^{-05}	10	1.38×10^{-05}	920	3.27×10^{-06}	10
Strontium-90	2.44×10^{-08}	50	6.58×10^{-08}	70	2.40×10^{-09}	70
Technetium-99	1.94×10^{-02}	90	2.85×10^{-01}	90	1.94×10^{-01}	40
Thorium-230	N/A	N/A	N/A	N/A	N/A	N/A
Thorium-232	N/A	N/A	N/A	N/A	N/A	N/A
Uranium-Total	$1.70 \times 10^{+02}$	190	$6.28 \times 10^{+03}$	210	$2.75 \times 10^{+03}$	790
Inorganics						
Antimony	$4.65 \times 10^{+01}$	10	$1.22 \times 10^{+01}$	10	$3.69 \times 10^{+01}$	10
Arsenic	$1.70 \times 10^{+00}$	1000	$5.13 \times 10^{+00}$	1000	$9.66 \times 10^{+00}$	10
Beryllium	2.57×10^{-02}	1000	1.12×10^{-01}	1000	4.27×10^{-05}	1000
Chromium (hex)	$1.22 \times 10^{+00}$	1000	$8.34 \times 10^{+00}$	1000	3.01×10^{-01}	1000
Cyanide	N/A	N/A	N/A	N/A	N/A	N/A
Lead	N/A	N/A	N/A	N/A	N/A	N/A
Magnesium	1.66×10^{5}	530	8.60×10^{5}	920	9.09×10^{5}	500
Manganese	$9.82 \times 10^{+02}$	10	$1.18 \times 10^{+03}$	10	$2.38 \times 10^{+03}$	10
Mercury	N/A	N/A	N/A	N/A	N/A	N/A
Organics						
Alpha-chlordane	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1254	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1260	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	N/A	N/A	N/A	N/A	N/A	N/A
N/ABenzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A
Bis(2-chloroisopropyl)ether	N/A	N/A	N/A	N/A	N/A	N/A
Bromodichloromethane	N/A	N/A	N/A	N/A	N/A	N/A
Bromomethane	N/A	N/A	N/A	N/A	N/A	N/A
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzo(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A
3,3-Dichlorobenzidine	N/A	N/A	N/A	N/A	N/A	N/A
1,1-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A
Dieldrin	N/A	N/A	N/A	N/A	N/A	N/A
Methylene Chloride	N/A	N/A	N/A	N/A	N/A	N/A
4-methylphenol	N/A	N/A	N/A	N/A	N/A	N/A
4-Nitroaniline	N/A	N/A	N/A	N/A	N/A	N/A
n-Nitroso-di-n-propylamine	N/A	N/A	N/A	N/A	N/A	N/A

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	Zone 4 Max Conc. (ppb)	Zone 4 Time	Zone 5 Max Conc. (ppb)	Zone 5 Time	Zone 6 Max. conc. (ppb)	Zone 6 Time
Radionuclides						
Neptunium-237	2.81×10^{-05}	810	8.66×10^{-04}	910	3.35×10^{-06}	440
Plutonium-238	N/A	N/A	N/A	N/A	N/A	N/A
Plutonium-239/240	N/A	N/A	N/A	N/A	N/A	N/A
Radium-226	3.37×10^{-06}	10	1.62×10^{-05}	1000	3.30×10^{-06}	10
Strontium-90	5.92×10^{-11}	130	9.89×10^{-08}	70	1.00×10^{-12}	170
Technetium-99	6.25×10^{-02}	60	4.01×10^{-01}	90	7.23×10^{-03}	80
Thorium-230	N/A	N/A	N/A	N/A	N/A	N/A
Thorium-232	N/A	N/A	N/A	N/A	N/A	N/A
Uranium-Total	$1.46 \times 10^{+03}$	780	$9.06 \times 10^{+03}$	1000	6.37×10^{00}	10
Inorganics						
Antimony	$4.04 \times 10^{+01}$	10	$2.91 \times 10^{+00}$	1000	2.17×10^{-01}	20
Arsenic	$4.64 \times 10^{+00}$	1000	$5.69 \times 10^{+00}$	1000	$1.36 \times 10^{+02}$	10
Beryllium	1.63×10^{-09}	1000	1.19×10^{-01}	1000	3.90×10^{-16}	1000
Chromium (hex)	1.29×10^{-01}	1000	$1.07 \times 10^{+01}$	1000	5.89×10^{-03}	320
Cyanide	N/A	N/A	N/A	N/A	N/A	N/A
Lead	N/A	N/A	N/A	N/A	N/A	N/A
Magnesium	2.53×10^{5}	950	1.35×10^{6}	520	2.03×10^{5}	990
Manganese	$8.12 \times 10^{+02}$	60	$1.35 \times 10^{+03}$	1000	$4.27 \times 10^{+02}$	10
Mercury	N/A	N/A	N/A	N/A	N/A	N/A
Organics						
Alpha-chlordane	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1254	N/A	N/A	N/A	N/A	N/A	N/A
Aroclor-1260	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A
Bis(2-chloroisopropyl)ether	N/A	N/A	N/A	N/A	N/A	N/A
Bromodichloromethane	N/A	N/A	N/A	N/A	N/A	N/A
Bromomethane	N/A	N/A	N/A	N/A	N/A	N/A
Carbazole	N/A	N/A	N/A	N/A	N/A	N/A
Chloroform	N/A	N/A	N/A	N/A	N/A	N/A
Dibenzo(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A
3,3-Dichlorobenzidine	N/A	N/A	N/A	N/A	N/A	N/A
1,1-Dichloroethene	N/A	N/A	N/A	N/A	N/A	N/A
Dieldrin	N/A	N/A	N/A	N/A	N/A	N/A
Methylene Chloride	N/A	N/A	N/A	N/A	N/A	N/A
4-methylphenol	N/A	N/A	N/A	N/A	N/A	N/A
4-Nitroaniline	N/A	N/A	N/A	N/A	N/A	N/A
n-Nitroso-di-n-propylamine	N/A	N/A	N/A	N/A	N/A	N/A

TABLE F.3.7-3 (Continued)

Constituent of Potential Concern	E. BOUND Concentration (ppb)	E. BOUND Time (Yr)	W. BOUND Concentration (ppb)	W. BOUND Time (Yr)	N. BOUND Concentration (ppb)	N. BOUND Time (Yr)
Radionuclides						
Neptunium-237	1.555×10^{-04}	1000	9.83×10^{-05}	350	3.117×10^{-08}	660
Plutonium-238	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA
Radium-226	1.318×10^{-06}	110	1.186×10^{-06}	10	1.083×10^{-06}	10
Strontium-90	8.247×10^{-10}	120	5.867×10^{-09}	70	8.31×10^{-16}	220
Technetium-99	6.248×10^{-02}	60	5.363×10^{-03}	90	2.623×10^{-03}	90
Thorium-230	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA
Uranium-Total	$1.263 \times 10^{+03}$	890	$1.108 \times 10^{+01}$	140	3.735×10^{-02}	50
Inorganics						
Antimony	$1.563 \times 10^{+00}$	110	2.554×10^{-01}	1000	7.731×10^{-05}	1000
Arsenic	1.677×10^{-01}	1000	3.856×10^{-01}	1000	$1.359 \times 10^{+02}$	10
Beryllium	1.419×10^{-08}	1000	5.367×10^{-03}	1000	0	
Chromium (hex)	$1.622 \times 10^{+00}$	1000	3.372×10^{-01}	1000	5.462×10^{-05}	480
Cyanide	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	$5.283 \times 10^{+05}$	720	$4.051 \times 10^{+04}$	470	$1.633 \times 10^{+05}$	730
Manganese	$4.426 \times 10^{+02}$	10	$2.855 \times 10^{+02}$	10	8.144×10^{-01}	1000
Mercury	NA	NA	NA	NA	NA	NA
Organics						
Alpha-chlordane	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Bis(2-chloroisopropyl)ether	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA
3,3-Dichlorobenzidine	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA
4-methylphenol	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA

[a] Fenceline maximum determined as the maximum from model cells representing the north, east, west, and south fencelines
[b] See Model Grid in Appendix F for locations
NA Not Applicable

TABLE F.3.7-4

OU5 RECEPTOR CONCENTRATIONS AT TIME OF URANIUM-TOTAL MAXIMUM CONCENTRATION

Receptor Location	Well 12	Well 13	Well 14	Well 34	Well 2071	Well 2119	Well 2127	FEMP Production Well	SOWC Coll 1	SOWC Coll 2	Strickers Grove Well	N.E. Recept.
	28,46,1	39,44,1	59,38,1	5,11,1	85,66,1	73,52,1	5,6,1	43,75,5	101,38,5	108,52,5	87,44,1	90,91,1
Time (Years)	180	320	990	940	200	940	850	270	1,000	1,000	1,000	240
Constituents of Potential Concern												
Radionuclides (µg/L)												
Neptunium-237	$1.77 \times 10^{+04}$	$2.19 \times 10^{+04}$	$1.11 \times 10^{+04}$	$1.93 \times 10^{+07}$	6.58×10^{-10}	$2.00 \times 10^{+05}$	1.98×10^{-06}	1.44×10^{-05}	5.61×10^{-07}	2.79×10^{-06}	9.69×10^{-06}	4.32×10^{-14}
Plutonium-238	9.55×10^{-18}	3.13×10^{-21}	9.09×10^{-26}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	3.68×10^{-15}	2.21×10^{-18}	5.06×10^{-21}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226	2.04×10^{-07}	8.16×10^{-05}	7.16×10^{-09}	1.70×10^{-09}	8.89×10^{-22}	5.24×10^{-08}	1.87×10^{-08}	1.87×10^{-09}	1.03×10^{-17}	6.02×10^{-16}	2.72×10^{-15}	8.95×10^{-22}
Strontium-90	4.34×10^{-09}	2.47×10^{-09}	1.02×10^{-10}	2.00×10^{-13}	2.37×10^{-14}	3.95×10^{-12}	1.92×10^{-12}	3.01×10^{-11}	2.95×10^{-15}	1.73×10^{-14}	8.20×10^{-14}	6.91×10^{-19}
Technetium-99	7.71×10^{-02}	8.67×10^{-02}	4.04×10^{-02}	6.51×10^{-05}	1.10×10^{-04}	4.23×10^{-03}	6.86×10^{-04}	1.10×10^{-03}	3.73×10^{-04}	7.09×10^{-04}	5.17×10^{-03}	3.47×10^{-07}
Thorium-230	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-Total	$1.40 \times 10^{+03}$	$1.76 \times 10^{+03}$	$8.73 \times 10^{+02}$	9.92×10^{-01}	$1.28 \times 10^{+00}$	$2.04 \times 10^{+02}$	$1.06 \times 10^{+01}$	$3.29 \times 10^{+00}$	$8.92 \times 10^{+00}$	$6.44 \times 10^{+01}$	$1.24 \times 10^{+02}$	4.90×10^{-02}
Radionuclides (pCi/L)												
Neptunium-237	1.25×10^{-01}	1.55×10^{-01}	7.80×10^{-02}	1.36×10^{-04}	4.64×10^{-07}	1.41×10^{-02}	1.40×10^{-03}	1.02×10^{-02}	3.96×10^{-04}	1.97×10^{-03}	6.83×10^{-03}	3.04×10^{-11}
Plutonium-238	1.63×10^{-10}	5.35×10^{-14}	1.56×10^{-18}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	2.28×10^{-10}	1.37×10^{-13}	3.14×10^{-16}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226	2.02×10^{-01}	8.07×10^{-03}	7.08×10^{-03}	1.68×10^{-03}	8.79×10^{-16}	5.19×10^{-02}	1.85×10^{-02}	1.85×10^{-03}	1.01×10^{-11}	5.95×10^{-10}	2.69×10^{-09}	8.85×10^{-16}
Strontium-90	5.94×10^{-01}	3.38×10^{-01}	1.39×10^{-02}	2.75×10^{-05}	3.24×10^{-06}	5.41×10^{-04}	2.62×10^{-04}	4.12×10^{-03}	4.04×10^{-07}	2.37×10^{-06}	1.12×10^{-05}	9.47×10^{-11}
Technetium-99	$1.31 \times 10^{+03}$	$1.47 \times 10^{+03}$	$6.86 \times 10^{+02}$	$1.11 \times 10^{+00}$	$1.87 \times 10^{+00}$	$7.18 \times 10^{+01}$	$1.17 \times 10^{+01}$	$1.86 \times 10^{+01}$	$6.33 \times 10^{+00}$	$1.21 \times 10^{+01}$	$8.79 \times 10^{+01}$	5.91×10^{-03}
Thorium-230	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-Total	$9.43 \times 10^{+02}$	$1.19 \times 10^{+03}$	$5.90 \times 10^{+02}$	6.70×10^{-01}	8.62×10^{-01}	$1.38 \times 10^{+02}$	$7.16 \times 10^{+00}$	$2.23 \times 10^{+00}$	$6.03 \times 10^{+00}$	$4.35 \times 10^{+01}$	$8.37 \times 10^{+01}$	3.31×10^{-02}

TABLE F.3.7-4 (Continued)

Receptor Location	Well 12	Well 13	Well 14	Well 34	Well 2071	Well 2119	Well 2127	FEMP Production Well	SOWC Coll 1	SOWC Coll 2	Strickers Grove Well	N.E. Recept.
	28,46,1	39,44,1	59,38,1	5,11,1	85,66,1	73,52,1	5,6,1	43,75,5	101,38,5	108,52,5	87,44,1	90,91,1
Time (Years)	180	320	990	940	200	940	850	270	1,000	1,000	1,000	240
Constituents of Potential Concern												
Organics (µg/L)												
Alpha-Chlordane	1.95×10^{-02}	1.18×10^{-02}	3.14×10^{-03}	NA	1.48×10^{-19}	9.42×10^{-10}	NA	NA	4.12×10^{-09}	1.62×10^{-10}	4.34×10^{-09}	NA
Aroclor-1254	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	1.16×10^{-04}	4.68×10^{-06}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)Anthracene	NA	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)Pyrene	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-Chloroisopropyl)Ether	9.29×10^{-01}	6.22×10^{-01}	2.33×10^{-01}	NA	2.51×10^{-02}	0[a]	NA	NA	0[a]	0[a]	0[a]	NA
BromoDiChloroMethane	5.51×10^{-02}	1.42×10^{-02}	NA	NA	NA	0[a]	NA	NA	0[a]	0[a]	0[a]	NA
BromoMethane	3.45×10^{-03}	2.05×10^{-05}	2.53×10^{-10}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	2.12×10^{-03}	NA	0[a]	4.31×10^{-04}	2.75×10^{-04}	4.87×10^{-05}	NA
Chloroform	9.05×10^{-03}	4.34×10^{-05}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DiBenzo(a,h)Anthracene	0[a]	0[a]	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-DiChloroBenzidine	NA	8.32×10^{-17}	0[a]	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DiChloroEthene	4.90×10^{-02}	3.92×10^{-03}	1.51×10^{-05}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NA	5.94×10^{-14}	1.96×10^{-19}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	7.15×10^{-08}	1.26×10^{-13}	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-MethylPhenol	$2.43 \times 10^{+02}$	$1.65 \times 10^{+02}$	$6.42 \times 10^{+01}$	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-NitroAniline	NA	4.50×10^{-01}	2.29×10^{-01}	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-Propylamine	NA	4.17×10^{-04}	1.09×10^{-05}	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE F.3.7-4 (Continued)

Receptor Location	Well 12	Well 13	Well 14	Well 34	Well 2071	Well 2119	Well 2127	FEMP Production Well	SOWC Coll 1	SOWC Coll 2	Strickers Grove Well	N.E. Recept.
	28,46,1	39,44,1	59,38,1	5,11,1	85,66,1	73,52,1	5,6,1	43,75,5	101,38,5	108,52,5	87,44,1	90,91,1
Time (Years)	180	320	990	940	200	940	850	270	1,000	1,000	1,000	240
Constituents of Potential Concern												
Inorganics (mg/L)												
Antimony	6.41×10^{-05}	5.66×10^{-06}	4.51×10^{-07}	5.83×10^{-07}	1.34×10^{-13}	3.22×10^{-07}	3.90×10^{-06}	3.16×10^{-06}	3.53×10^{-15}	5.07×10^{-11}	1.26×10^{-16}	0[a]
Arsenic	3.64×10^{-07}	1.53×10^{-11}	1.04×10^{-16}	4.45×10^{-04}	9.67×10^{-25}	5.06×10^{-18}	3.70×10^{-03}	1.21×10^{-19}	0[a]	0[a]	0[a]	0[a]
Beryllium	2.26×10^{-09}	2.54×10^{-14}	1.88×10^{-20}	0[a]	0[a]	0[a]	0[a]	0[a]	0[a]	0[a]	0[a]	0[a]
Chromium (hex)	1.84×10^{-03}	2.30×10^{-03}	1.13×10^{-03}	1.62×10^{-06}	5.66×10^{-10}	1.37×10^{-04}	1.69×10^{-05}	5.26×10^{-05}	9.06×10^{-06}	2.23×10^{-05}	1.34×10^{-04}	2.38×10^{-15}
Cyanide	4.74×10^{-01}	6.68×10^{-01}	2.73×10^{-01}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	8.70×10^{-06}	1.25×10^{-07}	2.34×10^{-10}	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	$1.88 \times 10^{+02}$	$2.27 \times 10^{+02}$	$1.56 \times 10^{+02}$	$1.69 \times 10^{+01}$	1.15×10^{-06}	$4.46 \times 10^{+01}$	$1.77 \times 10^{+00}$	$1.74 \times 10^{+02}$	4.96×10^{-01}	$6.46 \times 10^{+00}$	$1.30 \times 10^{+01}$	6.15×10^{-13}
Manganese	4.43×10^{-02}	1.74×10^{-02}	2.49×10^{-03}	1.31×10^{-03}	4.39×10^{-08}	7.97×10^{-04}	1.03×10^{-02}	6.67×10^{-02}	2.77×10^{-05}	4.79×10^{-04}	1.76×10^{-05}	3.78×10^{-19}
Mercury	NA	NA	5.82×10^{-10}	NA	NA	1.35×10^{-10}	NA	NA	9.44×10^{-14}	3.93×10^{-11}	4.30×10^{-13}	NA

NA - not applicable
[a]- "0" indicates concentration less than SWIFT calculation limit of 1×10^{-22}.

TABLE F.3.7-5

MAXIMUM ECTran CONCENTRATIONS FOR SURFACE SOIL AS SOURCE

Exposure Point	FEMP Property			FEMP Fenceline			Well 2071		
Constituent of Potential Concern	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 1000 yrs (μg/L)	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 890 yrs (μg/L)	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 200 yrs (μg/L)
Organics									
Alpha-chlordane	6.73×10^{-02}	400	3.41×10^{-13}	1.90×10^{-02}	440	9.38×10^{-10}	3.05×10^{-03}	480	1.48×10^{-19}
Bis (2-chloroisopropyl)ether	2.64×10^{00}	80	0.00×10^{00}	1.07×10^{00}	100	1.00×10^{00}	4.01×10^{-01}	120	9.88×10^{-04}
Bromodichloromethane	1.95×10^{00}	40	0.00×10^{00}	9.91×10^{-01}	60	0.00×10^{00}	NA	NA	NA
Carbazole	2.38×10^{00}	520	2.90×10^{-03}	1.60×10^{-01}	600	6.15×10^{-03}	NA	NA	NA
Inorganics									
Mercury	9.55×10^{00}	1000	9.55×10^{00}	6.15×10^{-03}	720	2.44×10^{-03}	NA	NA	NA

NA Not applicable.

TABLE F.3.7-5 (Continued)

Exposure Point	Well 2119			Strickers Grove Well			SOWC Coll 1		
Constituent of Potential Concern	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 940 yrs (μg/L)	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 1000 yrs (μg/L)	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 1000 yrs (μg/L)
Organics									
Alpha-chlordane	3.07×10^{-03}	480	9.42×10^{-10}	3.09×10^{-03}	500	4.34×10^{-09}	2.65×10^{-03}	500	4.12×10^{-09}
Bis(2-chloroisopropyl)ether	3.94×10^{-01}	100	0.00×10^{00}	1.62×10^{-01}	120	0.00×10^{00}	1.73×10^{-01}	120	0.00×10^{00}
Bromodichloromethane	4.29×10^{-01}	60	0.00×10^{00}	2.17×10^{-01}	80	0.00×10^{00}	1.86×10^{-01}	80	0.00×10^{00}
Carbazole	9.94×10^{-03}	720	2.12×10^{-03}	4.85×10^{-03}	720	4.87×10^{-04}	3.87×10^{-03}	740	4.31×10^{-04}
Inorganics									
Mercury	1.83×10^{-06}	1000	1.35×10^{-07}	4.30×10^{-10}	1000	4.30×10^{-10}	9.44×10^{-11}	1000	9.44×10^{-11}

NA Not applicable.

TABLE F.3.7-5 (Continued)

Exposure Point	SOWC Coll 2			Well 14			FEMP Production Well		
Constituent of Potential Concern	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 1000 yrs (μg/L)	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 990 yrs (μg/L)	Maximum Conc. (μg/L)	Time of Max. (yrs)	Conc. at 30 yrs (μg/L)
Organics									
Alpha-chlordane	1.43×10^{-03}	480	1.62×10^{-10}	1.02×10^{-02}	460	1.28×10^{-11}	NA	NA	NA
Bis (2-chloroisopropyl)ether	1.88×10^{-01}	120	0.00×10^{00}	NA	NA	NA	NA	NA	NA
Bromodichloromethane	1.52×10^{-01}	80	0.00×10^{00}	NA	NA	NA	NA	NA	NA
Carbazole	3.45×10^{-03}	720	2.75×10^{-04}	NA	NA	NA	1.78×10^{-02}	220	0.00×10^{00}
Inorganics									
Mercury	3.98×10^{-08}	1000	3.93×10^{-08}	2.20×10^{-03}	760	4.67×10^{-04}	NA	NA	NA

NA Not applicable.

TABLE F.3.7-6

MAXIMUM ECTran CONCENTRATIONS FOR SURFACE WATER AS A VERTICAL SOURCE

Exposure Point	FEMP Property				FEMP Fenceline			
Constituents of Potential Concern	Source Area	Maximum Conc. (ug/l)	Time of Max (yrs)	Conc. at 180 yrs (ug/l)	Source Area	Maximum Conc. (ug/l)	Time of Max (yrs)	Conc. at 260 yrs (ug/l)
Radionuclides								
Plutonium-238	SSOD	3.68×10^{-8}	600	3.68×10^{-8}	SSOD	8.06×10^{-15}	860	8.24×10^{-16}
Plutonium-239/240	SSOD	1.27×10^{-5}	960	1.27×10^{-5}	SSOD	2.77×10^{-11}	1000	5.67×10^{-13}
Thorium-230	SSOD	1.57×10^{-4}	1000	1.57×10^{-4}	SSOD	2.44×10^{-53}	1000	0.00×10^{0}
Thorium-232	SSOD	2.23×10^{0}	1000	2.23×10^{0}	SSOD	3.52×10^{-49}	1000	0.00×10^{0}
Uranium-234	SSOD	5.71×10^{0}	160	5.71×10^{0}	SSOD	5.80×10^{-1}	100	5.80×10^{-1}
Uranium-235/236	SSOD	1.01×10^{3}	120	1.01×10^{3}	SSOD	1.03×10^{2}	100	1.03×10^{2}
Uranium-238	SSOD	1.23×10^{5}	140	1.23×10^{5}	SSOD	1.26×10^{4}	100	1.26×10^{4}
Inorganics								
Cyanide	SSOD	6.36×10^{3}	20	6.36×10^{3}	SSOD	9.74×10^{2}	40	9.74×10^{2}
Lead	SSOD	2.44×10^{2}	1000	2.44×10^{2}	SSOD	1.23×10^{-1}	780	5.14×10^{-2}
Magnesium	SSOD	9.35×10^{6}	280	9.35×10^{6}	SSOD	5.44×10^{5}	180	5.44×10^{5}
Organics								
Alpha-chlordane	SSOD	1.47×10^{-1}	60	1.47×10^{-1}	SSOD	1.95×10^{-2}	60	1.95×10^{-2}
Arochlor-1254	SSOD	5.66×10^{-2}	1000	5.66×10^{-2}	SSOD	3.14×10^{-25}	1000	0.00×10^{0}
Arochlor-1260	SSOD	1.48×10^{-2}	1000	1.48×10^{-2}	SSOD	8.18×10^{-29}	1000	0.00×10^{0}
Benzene	CD	1.33×10^{-1}	20	1.33×10^{-1}	CD	1.16×10^{-4}	60	1.16×10^{-4}
Benzo(a)anthracene	CD	7.31×10^{-4}	60	7.31×10^{-4}	SSOD	2.82×10^{-46}	580	7.76×10^{-55}
Benzo(a)pyrene	SSOD	3.64×10^{-6}	100	3.64×10^{-6}	SSOD	2.47×10^{-52}	680	3.22×10^{-63}
Bis(2-chloroisopropyl) ether	SSOD	6.25×10^{0}	40	6.25×10^{0}	SSOD	9.29×10^{-1}	40	9.29×10^{-1}
Bromodichloromethane	DE	2.56×10^{-1}	20	2.56×10^{-1}	DE	5.51×10^{-2}	40	5.51×10^{-2}
Bromomethane	SSOD	3.80×10^{1}	20	3.80×10^{1}	SSOD	3.95×10^{-3}	40	3.95×10^{-3}
Chloroform	DE	7.87×10^{-1}	20	7.87×10^{-1}	DE	9.05×10^{-3}	40	9.05×10^{-3}
Dibenzo(a,h)anthracene	SSOD	1.48×10^{-5}	100	1.48×10^{-5}	SSOD	1.57×10^{-45}	740	7.67×10^{-59}
Dieldrin	CD	4.86×10^{-3}	60		SSOD	5.94×10^{-14}	200	4.60×10^{-14}
3,3'-Dichlorobenzidine	CD	2.53×10^{-2}	20	2.53×10^{-2}	CD	8.32×10^{-17}	60	8.32×10^{-17}
1,1-Dichloroethene	SSOD	2.92×10^{0}	20	2.92×10^{0}	SSOD	4.90×10^{-2}	40	4.90×10^{-2}
Methylene chloride	CD	2.87×10^{1}	20	2.87×10^{1}	SSOD	7.15×10^{-8}	40	5.55×10^{-8}
4-Methylphenol	SSOD	1.62×10^{3}	20	1.62×10^{3}	SSOD	3.43×10^{2}	40	2.43×10^{2}
4-Nitroaniline	CD	1.22×10^{1}	20	1.22×10^{1}	CD	4.50×10^{-1}	80	4.50×10^{-1}
N-nitroso-di-n-propylamine	CD	1.06×10^{0}	20	1.06×10^{0}	CD	4.7×10^{-4}	40	4.17×10^{-4}

TABLE F.3.7-6 (Continued)

Exposure Point	Well 12				Well 13			
Constituents of Potential Concern	Source Area	Maximum Conc. (ug/l)	Time of Max (yrs)	Conc. at 1000 yrs (ug/l)	Source Area	Maximum Conc. (ug/l)	Time of Max (yrs)	Conc. at 270 yrs (ug/l)
Radionuclides								
Plutonium-238	SSOD	8.06×10^{-15}	860	9.55×10^{-18}	SSOD	3.38×10^{-18}	1000	3.13×10^{-21}
Plutonium-239/240	SSOD	2.77×10^{-11}	1000	3.68×10^{-15}	SSOD	3.72×10^{-14}	1000	2.21×10^{-18}
Thorium-230	SSOD	2.44×10^{-53}	1000	0.00×10^{0}	SSOD	0.00×10^{0}	0	0.00×10^{0}
Thorium-232	SSOD	3.53×10^{-49}	1000	0.00×10^{0}	SSOD	0.00×10^{0}	0	0.00×10^{0}
Uranium-234	SSOD	5.80×10^{-1}	100	5.80×10^{-1}	SSOD	2.84×10^{-1}	160	2.84×10^{-1}
Uranium-235/236	SSOD	1.03×10^{2}	100	1.03×10^{2}	SSOD	5.03×10^{1}	160	5.03×10^{1}
Uranium-238	SSOD	1.26×10^{4}	100	1.26×10^{4}	SSOD	6.14×10^{3}	180	6.14×10^{3}
Inorganics								
Cyanide	SSOD	9.74×10^{2}	40	9.74×10^{2}	SSOD	6.68×10^{2}	40	6.68×10^{2}
Lead	SSOD	1.23×10^{-1}	780	8.70×10^{-3}	SSOD	2.92×10^{-3}	1000	1.25×10^{-4}
Magnesium	SSOD	5.44×10^{5}	180	5.44×10^{5}	SSOD	1.76×10^{5}	300	1.75×10^{5}
Organics								
Alpha-chlordane	SSOD	1.95×10^{-2}	60	1.95×10^{-2}	SSOD	1.18×10^{-2}	80	1.18×10^{-2}
Arochlor-1254	SSOD	3.14×10^{-25}	1000	0.00×10^{0}	SSOD	2.03×10^{-38}	1000	0.00×10^{0}
Arochlor-1260	SSOD	8.18×10^{-29}	1000	0.00×10^{0}	SSOD	2.42×10^{-44}	1000	0.00×10^{0}
Benzene	NA	NA	NA	NA	CD	1.16×10^{-4}	60	1.16×10^{-4}
Benzo(a)anthracene	NA	NA	NA	NA	SSOD	2.82×10^{-46}	580	7.93×10^{-55}
Benzo(a)pyrene	SSOD	2.47×10^{-52}	680	0.00×10^{0}	SSOD	6.62×10^{-71}	880	0.00×10^{0}
Bis(2-chloroisopropyl)	SSOD	9.29×10^{-1}	40	9.29×10^{-1}	SSOD	6.22×10^{-1}	60	6.22×10^{-1}
Bromodichloromethane	DE	5.51×10^{-2}	40	5.51×10^{-2}	DE	1.42×10^{-2}	60	1.42×10^{-2}
Bromomethane	SSOD	3.95×10^{-3}	40	3.95×10^{-3}	SSOD	2.05×10^{-5}	40	2.05×10^{-5}
Chloroform	DE	9.05×10^{-3}	40	9.05×10^{-3}	DE	4.34×10^{-5}	40	4.34×10^{-5}
Dibenzo(a,h)anthracene	SSOD	1.57×10^{-45}	740	0.00×10^{0}	SSOD	9.35×10^{-52}	980	0.00×10^{0}
Dieldrin	NA	NA	NA	NA	SSOD	5.94×10^{-14}	200	5.94×10^{-14}
3,3'-Dichlorobenzidine	NA	NA	NA	NA	CD	8.32×10^{-17}	60	8.32×10^{-17}
1,1-Dichloroethene	SSOD	4.90×10^{-2}	40	4.90×10^{-2}	SSOD	3.92×10^{-3}	40	3.92×10^{-3}
Methylene chloride	NA	NA	NA	NA	SSOD	7.15×10^{-8}	40	7.15×10^{-8}
4-Methylphenol	SSOD	2.43×10^{2}	40	2.43×10^{2}	SSOD	1.65×10^{2}	40	1.65×10^{2}
4-Nitroaniline	NA	NA	NA	NA	CD	4.50×10^{-1}	80	4.50×10^{-1}
N-nitroso-di-n-	NA	NA	NA	NA	CD	4.7×10^{-4}	40	4.17×10^{-4}

6161

TABLE F.3.7-6 (Continued)

Exposure Point	Well 14			
Constituents of Potential Concern	Source Area	Maximum Conc. (ug/l)	Time of Max (yrs)	Conc. at 990 yrs (ug/l)
Radionuclides				
Plutonium-238	SSOD	9.09×10^{-26}	1000	9.09×10^{-26}
Plutonium-239/240	SSOD	5.28×10^{-21}	1000	5.06×10^{-21}
Thorium-230	SSOD	0.00×10^{0}	0	0.00×10^{0}
Thorium-232	SSOD	0.00×10^{0}	0	0.00×10^{0}
Uranium-234	SSOD	3.98×10^{-2}	340	3.98×10^{-2}
Uranium-235/236	SSOD	7.01×10^{0}	240	7.01×10^{0}
Uranium-238	SSOD	8.57×10^{2}	260	8.57×10^{2}
Inorganics				
Cyanide	SSOD	2.73×10^{2}	60	2.73×10^{2}
Lead	SSOD	2.37×10^{-7}	1000	2.34×10^{-7}
Magnesium	SSOD	7.92×10^{3}	480	7.92×10^{3}
Organics				
Alpha-chlordane	SSOD	3.14×10^{-3}	160	3.14×10^{-3}
Arochlor-1254	SSOD	0.00×10^{0}	0	0.00×10^{0}
Arochlor-1260	SSOD	0.00×10^{0}	0	0.00×10^{0}
Benzene	CD	4.68×10^{-6}	60	4.68×10^{-6}
Benzo(a)anthracene	SSOD	1.06×10^{-74}	940	1.06×10^{-74}
Benzo(a)pyrene	SSOD	4.25×10^{-116}	1000	3.11×10^{-116}
Bis(2-chloroisopropyl)ether	SSOD	2.33×10^{-1}	80	2.33×10^{-1}
Bromodichloromethane	NA	NA	NA	NA
Bromomethane	SSOD	2.53×10^{-10}	40	2.53×10^{-10}
Chloroform	NA	NA	NA	NA
Dibenzo(a,h)anthracene	SSOD	1.96×10^{-103}	1000	1.28×10^{-103}
Dieldrin	SSOD	1.96×10^{-19}	240	1.96×10^{-19}
3,3'-Dichlorobenzidine	CD	2.29×10^{-23}	80	2.29×10^{-23}
1,1-Dichloroethene	SSOD	1.51×10^{-5}	40	1.51×10^{-5}
Methylene chloride	SSOD	1.26×10^{-13}	40	1.26×10^{-13}
4-Methylphenol	SSOD	6.42×10^{1}	80	6.42×10^{1}
4-Nitroaniline	CD	2.29×10^{-1}	100	2.29×10^{-1}
N-nitroso-di-n-propylamine	CD	1.09×10^{-5}	40	1.09×10^{-5}

NA Not applicable

TABLE F.3.7-7

CPC MAXIMUM CONCENTRATIONS AT PILOT PLANT DITCH/PADDYS RUN PERCHED WATER AS A LATERAL SOURCE

Source Area	OU1 "A" Area			OU1 "B" Area		
Constituent of Potential Concern	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)
Radionuclide						
Neptunium-237	NM	NA	NA	NM	NA	NA
Strontium-90	6.51×10^{-17}	100	6.53×10^{-20}	1.06×10^{-12}	60	9.36×10^{-16}
Technetium-99	3.90×10^{-4}	40	3.64×10^{-7}	NM	NA	NA
Uranium-234	NM	NA	NA	3.20×10^{-13}	180	2.27×10^{-16}
Uranium-235/6	NM	NA	NA	5.92×10^{-10}	180	4.19×10^{-13}
Uranium-238	NM	NA	NA	2.76×10^{-7}	200	7.81×10^{-10}
Inorganic						
Antimony	NM	NA	NA	NM	NA	NA
Cadmium	NM	NA	NA	2.31×10^{-6}	160	2.04×10^{-9}
Cyanide	3.51×10^{-1}	40	9.38×10^{-4}	3.59×10^{-1}	20	1.02×10^{-1}
Magnesium	3.73×10^{-6}	160	2.49×10^{-9}	9.97×10^{-1}	100	1.06×10^{-3}
Manganese	NM	NA	NA	NM	NA	NA
Mercury	NM	NA	NA	1.52×10^{-7}	160	4.30×10^{-10}
Molybdenum	NM	NA	NA	2.99×10^{-3}	160	8.46×10^{-6}

TABLE F.3.7-7 (Continued)

Source Area	OU1 "A" Area			OU1 "B" Area		
Constituent of Potential Concern	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)
Organic						
1,1,2,2-Tetrachloroethane	NM	NA	NA	NM	NA	NA
1,1,2-Trichloroethane	NM	NA	NA	NM	NA	NA
1,1,1-Trichloroethane	NM	NA	NA	NM	NA	NA
1,2-Dichloroethene	NM	NA	NA	NM	NA	NA
1,1-Dichloroethane	NM	NA	NA	NM	NA	NA
1,1-Dichloroethene	NM	NA	NA	NM	NA	NA
2-Methylnaphthalene	NM	NA	NA	NM	NA	NA
Bromoform	NM	NA	NA	NM	NA	NA
Carbazole	5.41×10^{-7}	100	4.52×10^{-10}	1.49×10^{-2}	60	
Tetrachloroethene	NM	NA	NA	NM	NA	NA
Trichloroethene	NM	NA	NA	NM	NA	NA
Vinyl Chloride	4.63×10^{-3}	20	3.09×10^{-6}	NM	NA	NA

NM Indicates COPC was not modeled using ECTran because COPC screened out due to decay or no positive hits were detected in perched water.
NA Not applicable.

001033

F 6161

TABLE F.3.7-7 (Continued)

Source Area	OU4 Area			Pilot Plant Area		
Constituent of Potential Concern	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)
Radionuclide						
Neptunium-237	NM	NA	NA	NM	NA	NA
Strontium-90	NM	NA	NA	NM	NA	NA
Technetium-99	4.86×10^{-4}	20	1.10×10^{-6}	3.46×10^{-6}	40	9.81×10^{-10}
Uranium-234	3.47×10^{-8}	100	1.26×10^{-10}	1.14×10^{-25}	340	6.45×10^{-29}
Uranium-235/6	1.00×10^{-5}	100	3.62×10^{-8}	4.27×10^{-23}	340	3.87×10^{-26}
Uranium-238	1.10×10^{-3}	100	5.98×10^{-6}	2.76×10^{-21}	340	2.50×10^{-24}
Inorganic						
Antimony	2.96×10^{-4}	180	1.07×10^{-6}	NM	NA	NA
Cadmium	1.40×10^{0}	80	5.07×10^{-3}	NM	NA	NA
Cyanide	8.86×10^{0}	20	4.82×10^{-2}	NM	NA	NA
Magnesium	5.42×10^{2}	40	2.95×10^{0}	NM	NA	NA
Manganese	3.79×10^{-7}	180	1.79×10^{-9}	NM	NA	NA
Mercury	9.07×10^{-4}	80	4.93×10^{-6}	NM	NA	NA
Molybdenum	1.50×10^{-2}	80	8.16×10^{-5}	NM	NA	NA

TABLE F.3.7-7 (Continued)

Source Area	OU4 Area			Pilot Plant Area		
Constituent of Potential Concern	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)
Organic						
1,1,2,2-Tetrachloroethane	2.02×10^{-2}	20	1.10×10^{-4}	NM	NA	NA
1,1,2-Trichloroethane	4.23×10^{-1}	20	2.30×10^{-3}	NM	NA	NA
1,2-Dichloroethene	NM	NA	NA	3.43×10^{-3}	20	1.17×10^{-6}
1,1-Dichloroethane	NM	NA	NA	1.56×10^{-3}	20	1.41×10^{-6}
1,1-Dichloroethene	NM	NA	NA	4.08×10^{-4}	20	3.69×10^{-7}
2-Methylnaphthalene	NM	NA	NA	NM	NA	NA
Bromoform	8.56×10^{-2}	20	4.66×10^{-4}	NM	NA	NA
Carbazole	4.83×10^{-1}	40		1.63×10^{-7}	140	
Tetrachloroethene	NM	NA	NA	1.21×10^{-4}	40	4.12×10^{-8}
Trichloroethene	1.58×10^{0}	20	8.59×10^{-3}	1.31×10^{-4}	40	4.46×10^{-8}
Vinyl Chloride	NM	NA	NA	NM	NA	NA

NM Indicates COPC was not modeled using ECTran because COPC screened out due to decay or no positive hits were detected in perched water.

NA Not applicable.

TABLE F.3.7-7 (Continued)

Source Area	Plant 2/3 Area			Laboratory Area		
Constituent of Potential Concern	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)
Radionuclide						
Neptunium-237	NM	NA	NA	NA	NA	NA
Strontium-90	NM	NA	NA	NA	NA	NA
Technetium-99	3.15×10^{-5}	60	3.30×10^{-8}	3.02×10^{-6}	40	1.01×10^{-9}
Uranium-234	4.88×10^{-36}	480	5.11×10^{-39}	8.11×10^{-25}	320	6.48×10^{-28}
Uranium-235/6	1.12×10^{-33}	460	1.17×10^{-36}	5.77×10^{-23}	320	1.54×10^{-26}
Uranium-238	7.17×10^{-32}	480	7.51×10^{-35}	1.26×10^{-20}	320	1.34×10^{-23}
Inorganic						
Antimony	NM	NA	NA	NM	NA	NA
Cadmium	NM	NA	NA	NM	NA	NA
Cyanide	2.82×10^{-3}	40	2.95×10^{-6}	3.26×10^{2}	40	3.48×10^{-1}
Magnesium	NM	NA	NA	1.21×10^{-7}	180	1.35×10^{-10}
Manganese	NM	NA	NA	NM	NA	NA
Mercury	NM	NA	NA	NM	NA	NA
Molybdenum	NM	NA	NA	NM	NA	NA

TABLE F.3.7-7 (Continued)

Source Area	Plant 2/3 Area			Laboratory Area		
Constituent of Potential Concern	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)	Max. Conc. (μg/L)	Time of Max (yrs)	Loading Rate to Surface Water (kg/yr)
Organic						
1,1,2,2-Tetrachloroethane	NM	NA	NA	NM	NA	NA
1,1,2-Trichloroethane	NM	NA	NA	NM	NA	NA
1,1,1-Trichloroethane	NM	NA	NA	NM	NA	NA
1,2-Dichloroethene	NM	NA	NA	NM	NA	NA
1,1-Dichloroethane	NM	NA	NA	NM	NA	NA
1,1-Dichloroethene	NM	NA	NA	2.34×10^{-3}	20	2.49×10^{-6}
2-Methylnaphthalene	NM	NA	NA	NM	NA	NA
Bromoform	NM	NA	NA	NM	NA	NA
Carbazole	NM	NA	NA	1.61×10^{-7}	140	
Tetrachloroethene	NM	NA	NA	NM	NA	NA
Trichloroethene	NM	NA	NA	NM	NA	NA
Vinyl Chloride	NM	NA	NA	NM	NA	NA

NM Indicates COPC was not modeled using ECTran because COPC screened out due to decay or no positive hits were detected in perched water.

NA Not applicable.

TABLE F.3.7-8

SCREENING FOR PERCHED WATER IMPACTS TO SURFACE WATER

Constituent	Total Yearly Loading from Perched Water to Surface Water[a] (kg/yr)	Total Flow Rate[b] (L/yr)	Concentration in Paddys Run (μg/L)	10^{-7} Risk or 0.1 HQ Screening Level (μg/L)	Constituent Screened Out
Radionuclides					
Strontium-90	9.64×10^{-16}	2.03×10^{08}	4.61×10^{-15}	9.49×10^{-10}	Yes
Technetium-99	1.499×10^{-06}	2.03×10^{08}	7.38×10^{-06}	2.18×10^{-04}	Yes
Uranium-234	1.256×10^{-10}	2.03×10^{08}	6.19×10^{-10}	4.82×10^{-05}	Yes
Uranium-235/236	3.621×10^{-08}	2.03×10^{08}	1.78×10^{-07}	1.39×10^{-01}	Yes
Uranium-238	5.983×10^{-06}	2.03×10^{08}	2.95×10^{-05}	5.06×10^{-01}	Yes
Inorganics					
Antimony	1.072×10^{-06}	2.03×10^{08}	5.28×10^{-06}	1.50×10^{00}	Yes
Cadmium	5.069×10^{-03}	2.03×10^{08}	2.50×10^{-02}	1.80×10^{00}	Yes
Cyanide	4.981×10^{-01}	2.03×10^{08}	2.45×10^{00}	7.30×10^{01}	Yes
Magnesium	2.949×10^{00}	2.03×10^{08}	1.45×10^{01}	3.50×10^{04}	Yes
Manganese	1.785×10^{-09}	2.03×10^{08}	8.79×10^{-09}	1.80×10^{01}	Yes
Mercury	4.933×10^{-06}	2.03×10^{08}	2.43×10^{-05}	1.10×10^{00}	Yes
Molybdenum	9.004×10^{-05}	2.03×10^{08}	4.43×10^{-04}	1.80×10^{01}	Yes

TABLE F.3.7-8 (Continued)

Constituent	Total Yearly Loading from Perched Water to Surface Water[a] (kg/yr)	Total Flow Rate[b] (L/yr)	Concentration in Paddys Run (μg/L)	10^{-7} Risk or 0.1 HQ Screening Level (μg/L)	Constituent Screened Out
Organics					
1,1,2,2-Tetrachloroethene	1.099×10^{-04}	2.03×10^{08}	5.41×10^{-04}	9.00×10^{-03}	Yes
1,1,2-Trichloroehane	2.300×10^{-03}	2.03×10^{08}	1.13×10^{-02}	3.20×10^{-02}	Yes
1,2-Dichloroethene (Total)	1.167×10^{-06}	2.03×10^{08}	5.75×10^{-06}	3.70×10^{01}	Yes
1,1-Dichlorethane	1.412×10^{-06}	2.03×10^{08}	6.95×10^{-06}	9.70×10^{01}	Yes
1,1-Dichloroethene	2.863×10^{-06}	2.03×10^{08}	1.41×10^{-05}	6.70×10^{-03}	Yes
Bromoform	4.655×10^{-04}	2.03×10^{08}	2.29×10^{-03}	3.80×10^{-01}	Yes
Carbazole	2.669×10^{-03}	2.03×10^{08}	1.31×10^{-02}	4.30×10^{-01}	Yes
Tetrachloroethene	4.116×10^{-08}	2.03×10^{08}	2.03×10^{-07}	3.70×10^{01}	Yes
Trichloroethene	8.594×10^{-03}	2.03×10^{08}	4.23×10^{-02}	2.50×10^{-01}	Yes
Vinyl Chloride	3.093×10^{-06}	2.03×10^{08}	1.52×10^{-05}	2.80×10^{-03}	Yes

[a]See Table F.3.7-7
[b]The total flow rate in Paddys Run is based on the baseflow in Paddys Run (0.2 cfs, Dames and Moore, 1985) plus the calculated total flow from the perched water to surface water (0.027 cfs, based on average groundwater contours in the 1000-series monitoring wells and seepage faces along Paddys Run and the Pilot Plant Drainage Ditch).

TABLE F.3.8-1

SUMMARY OF ESTIMATED RANGE AND DISTRIBUTION OF MODEL PARAMETERS

Parameter	Minimum Value	Calibrated Value	Maximum Value	Assumed Distribution[a]
K_h	36 ft/day in K_h Zone VI	120 to 638 ft/day in 6 zones	1,831 ft/day in K_h Zone IV	Log Normal mean = 305 SD[b] = 1.593
K_h/K_v	5	5 to 20	100	Log Normal mean = 22.36 SD[b] = 2.115
Porosity (n)	15%	30%	50%	Log Normal mean = 27.40 SD[b] = 1.351
Gradient (I)	0.00033 - PA[c] 0.0008 - SF[c]	Varies	0.0067 - PA 0.001 - SF	Uniform
Transport Distance (L)	2,875 ft. - PA 4,150 ft. - SF	Varies	3,000 ft. - PA 4,250 ft. - SF	Uniform
Partition Coefficient (K_l/K_d)	0.96 L/Kg	1.78 L/Kg	3.80 L/Kg	Log Normal mean = 1.910 SD[b] = 1.411
Dispersivity (α)	62.5 ft	100 ft	250 ft	Uniform
Mixing Depth (d_m)	5 ft	Layer 1 saturated thickness approx 10 ft	15 ft	Uniform
Infiltration Rate	4 in/yr	6 in/yr	8 in/yr	Uniform

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[a] In establishing distributions, the range is assumed to represent a 95 percent confidence interval, with approximately 2 standard deviations above and below the mean. Standard deviations were calculated based on this assumption.

[b] Standard deviation for log normal distributions are reported as a multiplicative factor.

[c] PA = Production Area hypothetical source
SF = South Field hypothetical source

TABLE F.3.8-2

SUMMARY OF ECTran MODEL MONTE CARLO RESULTS

Parameters (Units)	Case 1	Case 2	Case 3
Range of predicted maximum concentration for source area (μg/L)	1.46×10^5 to 1.21×10^7	2.03×10^5 to 1.54×10^7	N/A
Range of predicted maximum concentration for fenceline (μg/L)	1.28×10^1 to 2.73×10^5	5.83×10^{-2} to 3.83×10^5	5.96×10^{-3} to 5.38×10^1
Baseline maximum GMA concentration in source area (μg/L)	2.25×10^8	2.25×10^5	9.05×10^1
Baseline maximum GMA concentration in source area (μg/L)	7.74×10^4	7.74×10^4	1.48×10^1
Mean source area GMA concentration (μg/L)	2.58×10^6	2.50×10^8	N/A
Mean fenceline area GMA concentration (μg/L)	4.09×10^4	4.55×10^4	1.20×10^1
% < baseline source area GMA concentration	54%	58%	N/A
% < baseline fenceline GMA concentration	86%	81%	58%

TABLE F.3.8-3

SIMULATIONS FOR SWIFT MODEL SENSITIVITY ANALYSIS

Simulation Objective	K_h (ft/day)	K_d (L/kg)	α (ft)	K_h/K_v	n (%)
1. Baseline	As calibrated	As calibrated	As calibrated	As calibrated	As calibrated
2. Minimize Travel Time to Exposure Point	- 774 for till zone - (774/till zone K_h) * zone K_h for other zones	0.96	250	100	15
3. Maximize GMA Concentration	- 120 for river zone K_h - (120/river zone K_h) * zone K_h for other zones	0.96	62.5	100	15
4. Effect of K_h Variation on Maximum Concentration and Minimum Travel Time - Minimum K_h	- 120 for river zone K_h - (120/river zone K_h) * zone K_h for other zones	As calibrated	As calibrated	As calibrated	As calibrated
5. Effect of K_h Variation on Maximum Concentration and Minimum Travel Time - Maximum K_h	- 774 for till zone - (774/till zone K_h) * zone K_h for other zones	As calibrated	As calibrated	As calibrated	As calibrated
6. Effect of K_h/K_v Variation on Maximum Concentration and Minimum Travel Time - Minimum K_h/K_v	As calibrated	As calibrated	As calibrated	5	As calibrated
7. Effect of K_h/K_v Variation on Maximum Concentration and Minimum Travel Time - Maximum K_h/K_v	As calibrated	As calibrated	As calibrated	100	As calibrated
8. Effect of K_d Variation on Maximum Concentration and Travel Time - Minimum K_d	As calibrated	0.96	As calibrated	As calibrated	As calibrated

TABLE F.3.8-3 (Continued)

Simulation Objective	K_h (ft/day)	K_d (L/kg)	α (ft)	K_h/K_v	n (%)
9. Effect of K_d Variation on Maximum Concentration and Travel Time - Maximum K_d	As calibrated	3.80	As calibrated	As calibrated	As calibrated
10. Effect of α Variation on Maximum Concentration and Travel Time - Minimum α	As calibrated	As calibrated	62.5	As calibrated	As calibrated
11. Effect of α Variation on Maximum Concentration and Travel Time - Maximum α	As calibrated	As calibrated	250	As calibrated	As calibrated
12. Effect of n Variation on Maximum Concentration and Travel Time - Minimum n	As calibrated	As calibrated	As calibrated	As calibrated	15
13. Effect of n Variation on Maximum Concentration and Travel Time - Maximum n	As calibrated	As calibrated	As calibrated	As calibrated	50
14. Baseline	As calibrated	As calibrated	As calibrated	As calibrated	As calibrated
15. Minimize Travel Time to Exposure Point	- 774 for till zone - (774/till zone K_h) * zone K_h for other zones	0.96	250	100	15
16. Maximize Travel Time to Exposure Point	- 120 for river zone K_h - (120/river zone K_h) * zone K_h for other zones	3.80	62.5	5	50
17. Compare Original and Revised Model	450 layers 1 and 2 600 layers 4 and 5	1.75	100	10	0.25

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TABLE F.3.8-4

MAXIMUM GRID AND FENCELINE CONCENTRATIONS

Case Number	Case Description	Cell Location (Grid)	Time of Max (years)	Concentration (ppb)	% of Base Case
Grid Maximum					
Case 1	Baseline	(55,83,1)	100	$7.022 \times 10^{+5}$	
Case 2	Min. Travel Time	(55,83,1)	100	$1.516 \times 10^{+5}$	22%
Case 3	Max. GMA Conc	(55,83,1)	100	$1.545 \times 10^{+6}$	220%
Case 4	Min. K_h	(55,83,1)	100	$1.471 \times 10^{+6}$	209%
Case 5	Max. K_h	(55,83,1)	100	$2.971 \times 10^{+5}$	42%
Case 6	Min. K_h/K_v	(55,83,1)	100	$7.749 \times 10^{+5}$	110%
Case 7	Max. K_h/K_v	(55,83,1)	100	$5.886 \times 10^{+5}$	84%
Case 8	Min. K_d	(55,83,1)	100	$7.023 \times 10^{+5}$	100%
Case 9	Max. K_d	(55,83,1)	100	$7.013 \times 10^{+5}$	100%
Case 10	Min. Disp.	(55,83,1)	100	$8.838 \times 10^{+5}$	126%
Case 11	Max. Disp.	(55,83,1)	100	$3.814 \times 10^{+5}$	54%
Case 12	Min. Porosity	(55,83,1)	100	$7.022 \times 10^{+5}$	100%
Case 13	Max. Porosity	(55,83,1)	100	$7.022 \times 10^{+5}$	100%
Case 17	Original Model	(55, 83, 1)	100	$2.336 \times 10^{+5}$	33%
Fenceline Maximum					
Case 1	Baseline	(34,47,1)	100	$2.058 \times 10^{+4}$	
Case 2	Min. Travel Time	(34,47,1)	100	$5.695 \times 10^{+3}$	28%
Case 3	Max. GMA Conc	(72,70,2)	140	$2.186 \times 10^{+4}$	106%
Case 4	Min. K_h	(33,47,2)	120	$2.232 \times 10^{+4}$	108%
Case 5	Max. K_h	(33,47,1)	100	$1.514 \times 10^{+4}$	74%
Case 6	Min. K_h/K_v	(33,47,1)	100	$2.279 \times 10^{+4}$	111%
Case 7	Max. K_h/K_v	(36,46,1)	100	$1.419 \times 10^{+4}$	69%
Case 8	Min. K_d	(34,47,1)	100	$2.085 \times 10^{+4}$	101%
Case 9	Max. K_d	(34,47,1)	120	$1.850 \times 10^{+4}$	90%
Case 10	Min. Disp.	(34,47,1)	100	$2.940 \times 10^{+4}$	143%
Case 11	Max. Disp.	(34,47,1)	100	$1.032 \times 10^{+4}$	50%
Case 12	Min. Porosity	(34,47,1)	100	$2.033 \times 10^{+4}$	99%
Case 13	Max. Porosity	(34,47,1)	100	$2.077 \times 10^{+4}$	101%
Case 17	Original Model	(73, 72, 2)	160	$9.559 \times 10^{+3}$	46%

TABLE F.3.8-5

TIME OF ARRIVAL AND CONCENTRATIONS AT THE EAST AND SOUTH BOUNDARIES

Case Number	Case Description	Approx. 1st Arrival Time (years)	Time of Max(years)	Concentration (ppb) at Time of Maximum	%of Base Case
East-Maximum at (70;66)					
Case 1	Baseline	60	160	$1.065 \times 10^{+4}$	
Case 2	Min. Travel Time	<20	100	$4.500 \times 10^{+3}$	42%
Case 3	Max. GMA Conc	40	140	$1.355 \times 10^{+4}$	127%
Case 4	Min. K_h	100	260	$8.758 \times 10^{+3}$	82%
Case 5	Max. K_h	20	120	$7.812 \times 10^{+3}$	73%
Case 6	Min. K_h/K_v	60	200	$9.094 \times 10^{+3}$	85%
Case 7	Max. K_h/K_v	20	140	$1.096 \times 10^{+4}$	103%
Case 8	Min. K_d	20	120	$1.338 \times 10^{+4}$	126%
Case 9	Max. K_d	100	280	$6.289 \times 10^{+3}$	59%
Case 10	Min. Disp.	40	160	$1.501 \times 10^{+4}$	141%
Case 11	Max. Disp.	40	160	$5.107 \times 10^{+3}$	48%
Case 12	Min. Porosity	60	180	$9.863 \times 10^{+3}$	93%
Case 13	Max. Porosity	40	140	$1.199 \times 10^{+4}$	113%
South-Maximum at (34;47)					
Case 1	Baseline	<20	100	$2.058 \times 10^{+4}$	
Case 2	Min. Travel Time	<20	80	$5.150 \times 10^{+3}$	25%
Case 3	Max. GMA Conc	<20	100	$8.953 \times 10^{+3}$	44%
Case 4	Min. K_h	20	120	$1.948 \times 10^{+4}$	95%
Case 5	Max. K_h	<20	80	$1.597 \times 10^{+4}$	78%
Case 6	Min. K_h/K_v	<20	100	$2.039 \times 10^{+4}$	99%
Case 7	Max. K_h/K_v	<20	100	$1.215 \times 10^{+4}$	59%
Case 8	Min. K_d	<20	100	$2.085 \times 10^{+4}$	101%
Case 9	Max. K_d	20	120	$1.850 \times 10^{+4}$	90%
Case 10	Min. Disp.	<20	100	$2.940 \times 10^{+4}$	143%
Case 11	Max. Disp.	<20	100	$1.032 \times 10^{+4}$	50%
Case 12	Min. Porosity	<20	100	$2.033 \times 10^{+4}$	99%
Case 13	Max. Porosity	<20	100	$2.077 \times 10^{+4}$	101%

TABLE F.3.8-6

UNCERTAINTY ANALYSIS OF Kd FOR URANIUM-TOTAL CASES 1 AND 2

Receptor Location	Well 12	Well 13	Well 14	Well 34	Well 2071	Well 2119	Well 2127	FEMP Production Well	SOWC Coll 1	SOWC Coll 2	Strickers Grove Well	N.E. Recept.
	28,46,1	39,44,1	59,38,1	5,11,1	85,66,1	73,52,1	5,6,1	43,75,5	101,38,5	108,52,5	87,44,1	90,91,1
Constituents of Potential Concern												
Radionuclides												
U-Total Uncertainty Analysis Case 1												
Time (year)	900	890	1000	1000	990	1000	1000	840	1000	1000	1000	1000
Concentration (μg/L)	1.996×10^{-02}	1.992×10^{01}	3.527×10^{02}	4.754×10^{-03}	5.252×10^{01}	4.901×10^{02}	5.720×10^{-02}	5.974×10^{01}	5.068×10^{00}	8.038×10^{01}	8.657×10^{01}	5.247×10^{-03}
U-Total Uncertainty Analysis Case 2												
Time (year)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Concentration (μg/L)	1.661×10^{-02}	1.042×10^{01}	2.557×10^{02}	2.503×10^{-03}	3.841×10^{01}	3.550×10^{02}	3.015×10^{-02}	5.132×10^{01}	2.619×10^{00}	4.678×10^{01}	4.607×10^{01}	2.908×10^{-03}

TABLE F.3.8-6 (Continued)

Receptor Location	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	E. Bound	W. Bound	N. Bound
Constituents of Potential Concern									
Radionuclides									
U-Total Uncertainty Analysis Case 1									
Time (year)	800	810	800(a)	860	830	870	910	870	920
Concentration (μg/L)	6.987×10^{00}	6.169×10^{03}	1.2160×10^{04}	1.5230×10^{03}	3.2010×10^{03}	4.7010×10^{-02}	9.9610×10^{02}	9.6510×10^{-05}	6.3890×10^{-05}
U-Total Uncertainty Analysis Case 2									
Time (year)	980	980	980	1000	1000	1000	1000	1000	1000
Concentration (μg/L)	5.7920×10^{00}	5.049×10^{03}	9.9370×10^{03}	1.2820×10^{03}	2.644×10^{03}	3.9260×10^{-02}	8.3310×10^{0}	8.0980×10^{-05}	5.2070×10^{-05}

TABLE F.3.8-7

UNCERTAINTY ANALYSIS OF Kd FOR URANIUM-TOTAL BASELINE CASE AND CASE 3

Receptor Location	Well 12	Well 13	Well 14	Well 34	Well 2071	Well 2119	Well 2127	FEMP Production Well	SOWC Coll 1	SOWC Coll 2	Strickers Grove Well	N.E. Recept.
	28,46,1	39,44,1	59,38,1	5,11,1	85,66,1	73,52,1	5,6,1	43,75,5	101,38,5	108,52,5	87,44,1	90,91,1
Constituents of Potential Concern												
Radionuclides												
U-Total Baseline												
Time (years)	180	320	990	940	0	940	850	270	1000	1000	1000	240
Concentration (µg/L)	1.395×10^{03}	1.785×10^{03}	8.732×10^{02}	9.916×10^{-01}	1.275×10^{00}	2.039×10^{02}	1.059×10^{01}	3.293×10^{00}	8.917×10^{00}	6.438×10^{01}	1.239×10^{02}	4.904×10^{-02}
U-Total Uncertainty Case 3												
Time (years)	480	730	1000	1000	950	1000	900	1000	1000	1000	1000	240
Concentration (µg/L)	1.3970×10^{03}	1.7700×10^{03}	9.0750×10^{02}	9.440×10^{-01}	6.5250×10^{01}	2.4380×10^{02}	1.0620×10^{01}	7.0720×10^{00}	9.3650×10^{00}	7.0440×10^{01}	1.341×10^{02}	4.8990×10^{-02}

TABLE F.3.8-7 (Continued)

Receptor Location	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	E. Bound	W. Bound	N. Bound
Constituents of Potential Concern									
Radionuclides									
U-Total Baseline									
Time (years)	190	210(a)	790	780	1000	10	890(a)	140(a)	50
Concentration (μg/L)	1.6970×10^{02}	6.2820×10^{03}	2.7490×10^{03}	1.4570×10^{03}	9.0630×10^{03}	6.3720×10^{00}	1.2630×10^{03}	1.1080×10^{01}	3.7350×10^{-02}
U-Total Uncertainty Case 3									
Time (years)	1000	1000	800	790	1000	1000	1000	990	1000
Concentration (μg/L)	9.1200×10^{01}	6.2940×10^{03}	2.8020×10^{03}	1.4890×10^{03}	9.1250×10^{03}	2.0810×10^{01}	1.3030×10^{03}	1.1140×10^{01}	1.9230×10^{00}

LEGEND:

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SCALE
0 625 1250 2500 FEET

STATE PLANAR COORDINATE SYSTEM 1927

P0116/SKX02935.DGN

FIGURE F.3.1-1 MODELING DOMAIN

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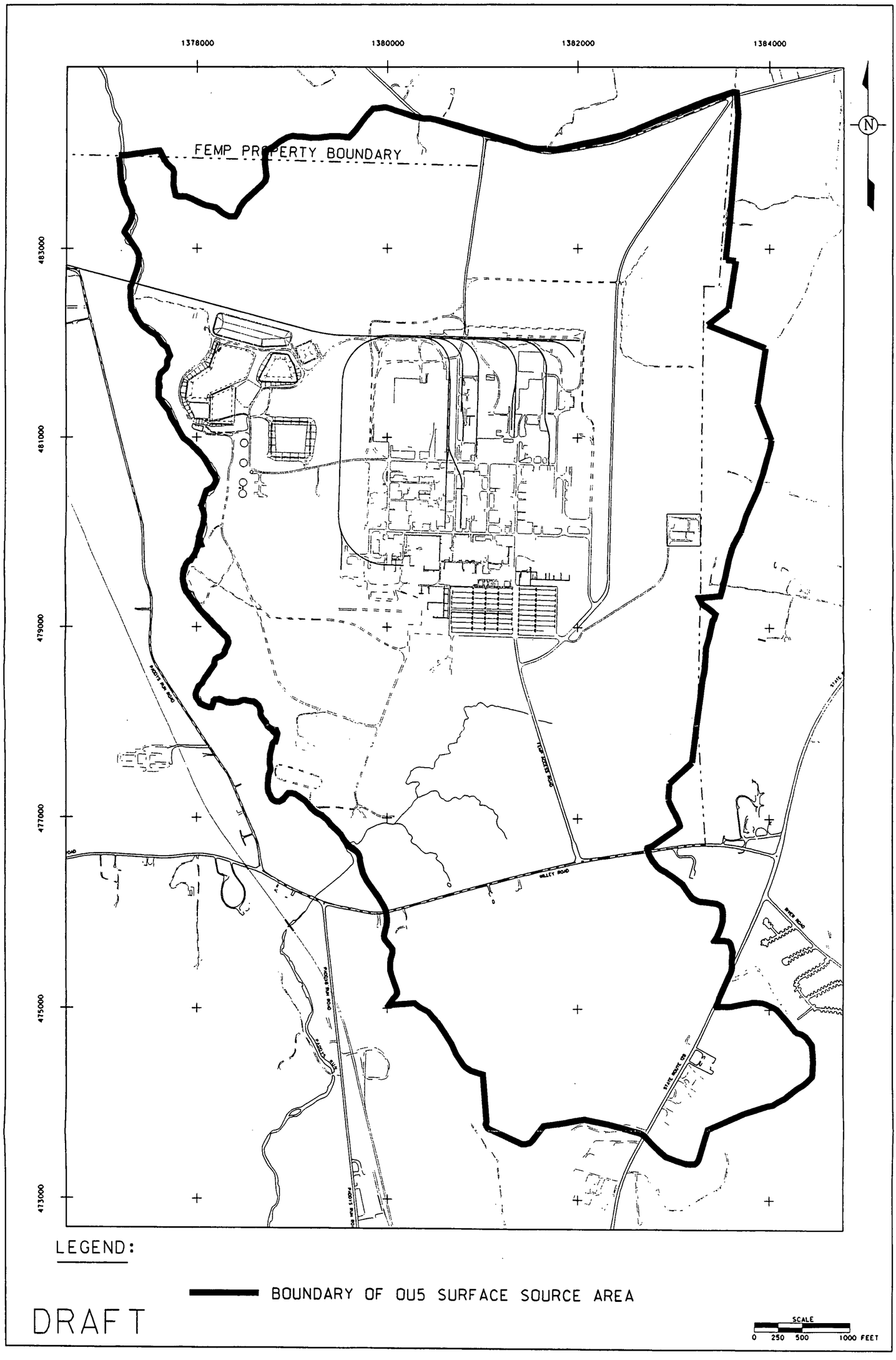

FIGURE F.3.1-2 OVERALL OPERABLE UNIT 5 SURFACE SOURCE AREA

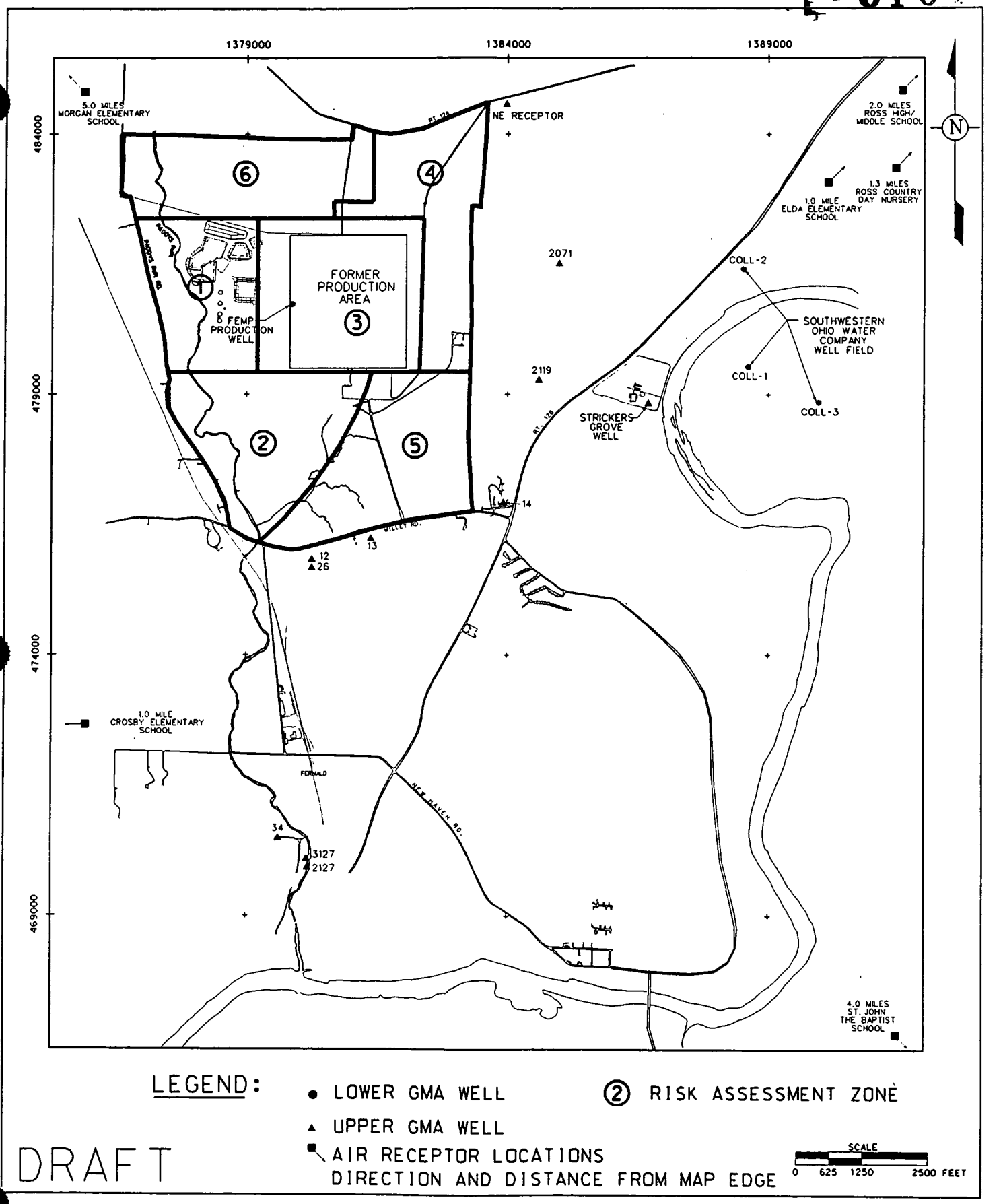

FIGURE F.3.1-3. OPERABLE UNIT 5 RISK ASSESSMENT ZONES AND RECEPTORS IN THE GROUNDWATER PATHWAY

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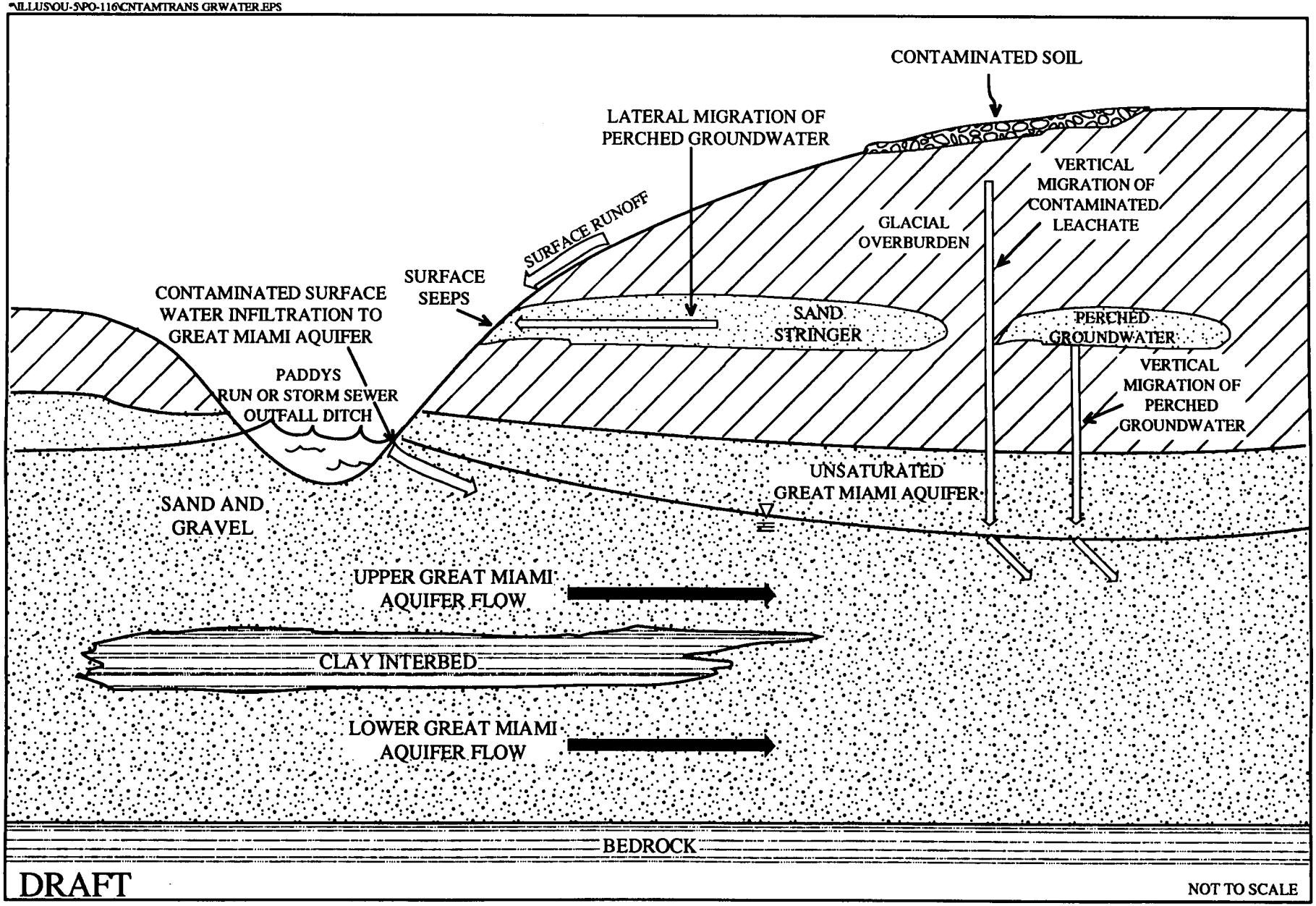
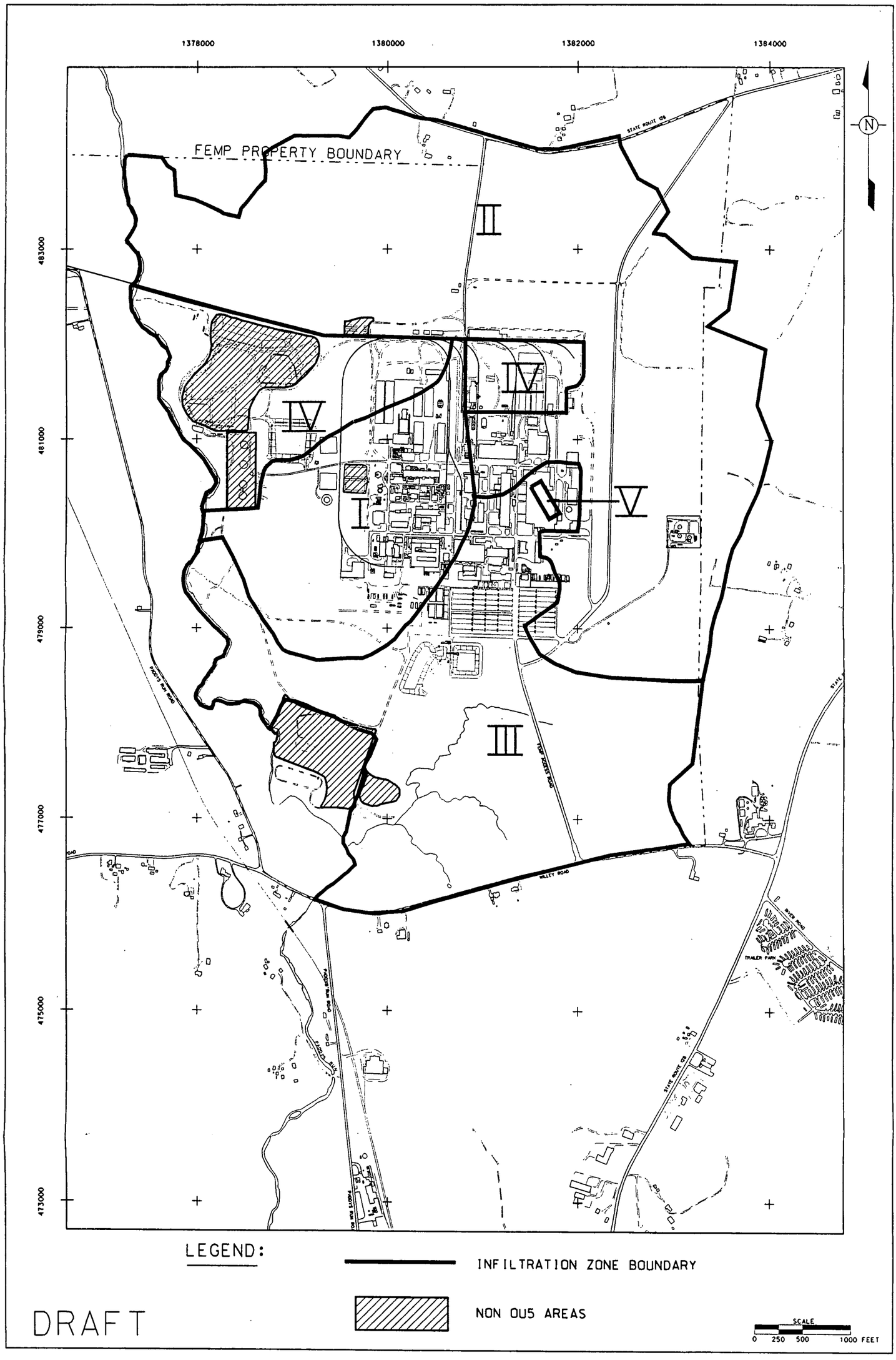


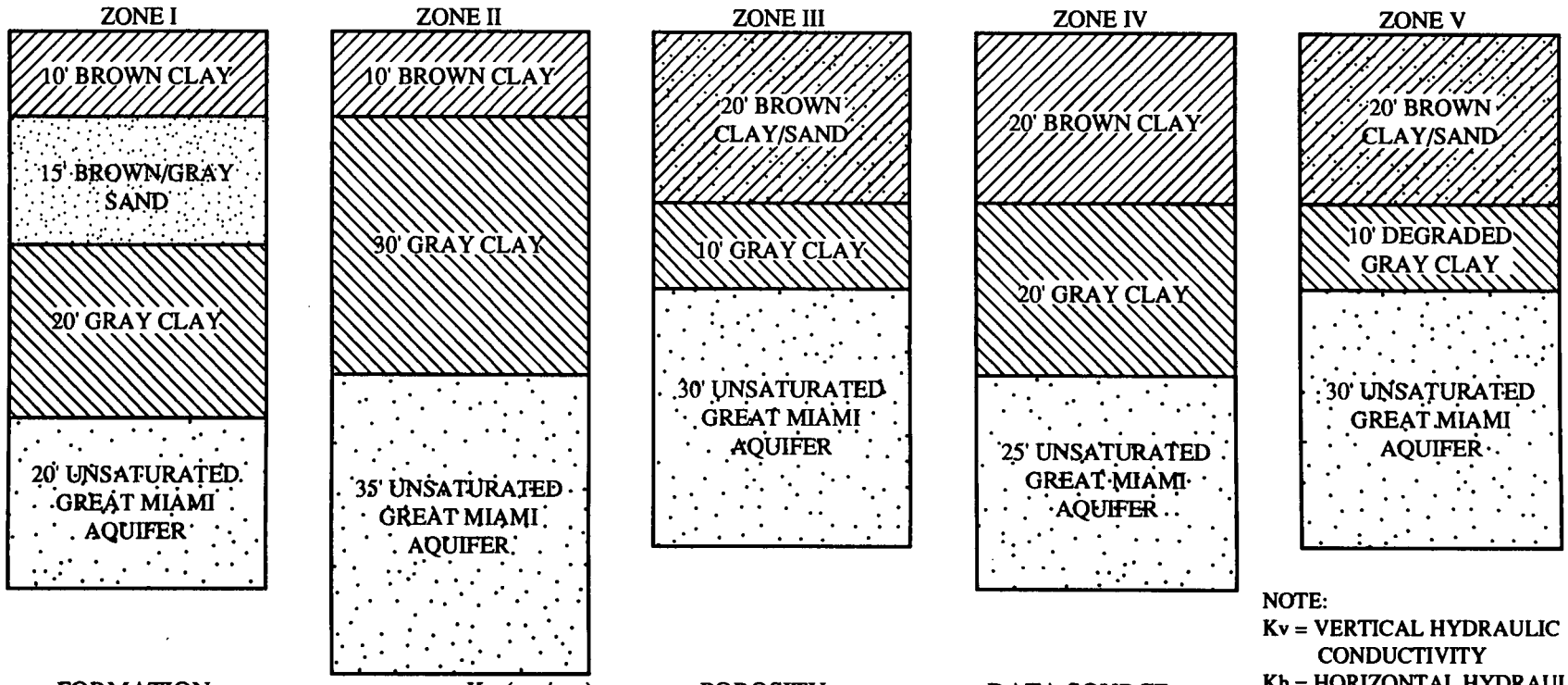
FIGURE F.3.2-1. CONCEPTUAL MODEL OF CONTAMINANT TRANSPORT BY GROUNDWATER AT THE FEMP



PD116/SKX02967.DGN

FIGURE F.3.2-2. GROUNDWATER FATE AND TRANSPORT MODELING INFILTRATION ZONES

*\ILLUS\OU-5\PO-116\GW F&T MOD.EPS



NOTE:
Kv = VERTICAL HYDRAULIC CONDUCTIVITY
Kh = HORIZONTAL HYDRAULIC CONDUCTIVITY

FORMATION	Kv (cm/sec)	POROSITY	DATA SOURCE
BROWN CLAY	3.59E -05	0.20	Kh FROM SLUG TESTS
GRAY CLAY	7.23E -07	0.20	Kv FROM GO/UGMAS MODEL CALIBRATION, ≈ 0.4 OF GEOMETRIC MEAN OF SLUG TEST RESULTS
DEGRADED GRAY CLAY	3.53E -04	0.20	Kv FROM GO/UGMAS MODEL CALIBRATION
BROWN/GRAY SAND	1.10E -04	0.30	HARMONIC MEAN OF Kh FROM SLUG TESTS DIVIDED BY 10
BROWN CLAY/SAND	7.04E -05	0.30	HARMONIC MEAN OF Kh FROM SLUG TESTS
UNSATURATED GMA	1.59E -02	0.30	Kv FROM SWIFT MODEL CALIBRATION

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FIGURE F.3.2-3. GROUNDWATER FATE AND TRANSPORT MODELING CONCEPTUAL MODEL ZONES - GENERALIZED CROSS SECTIONS

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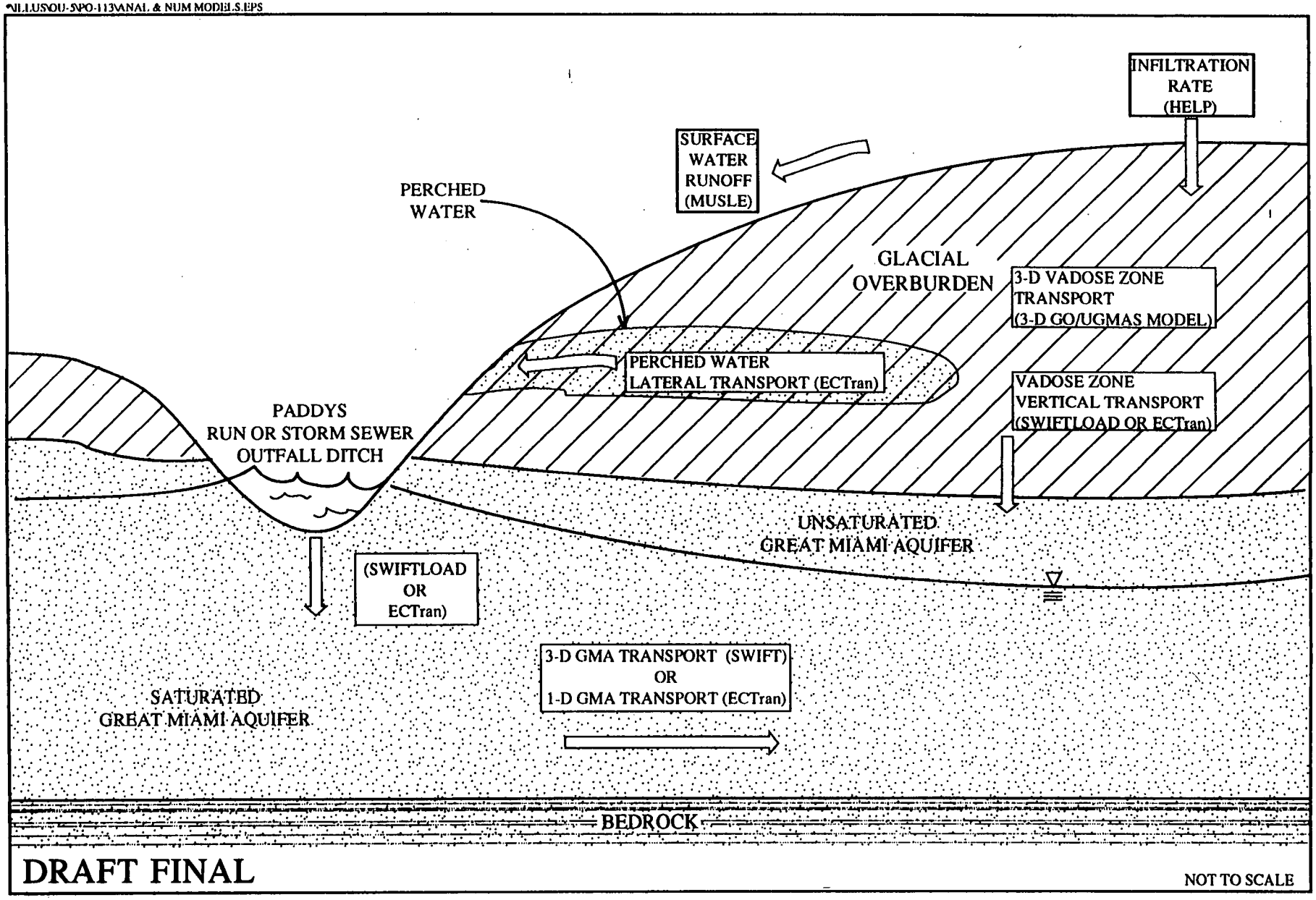
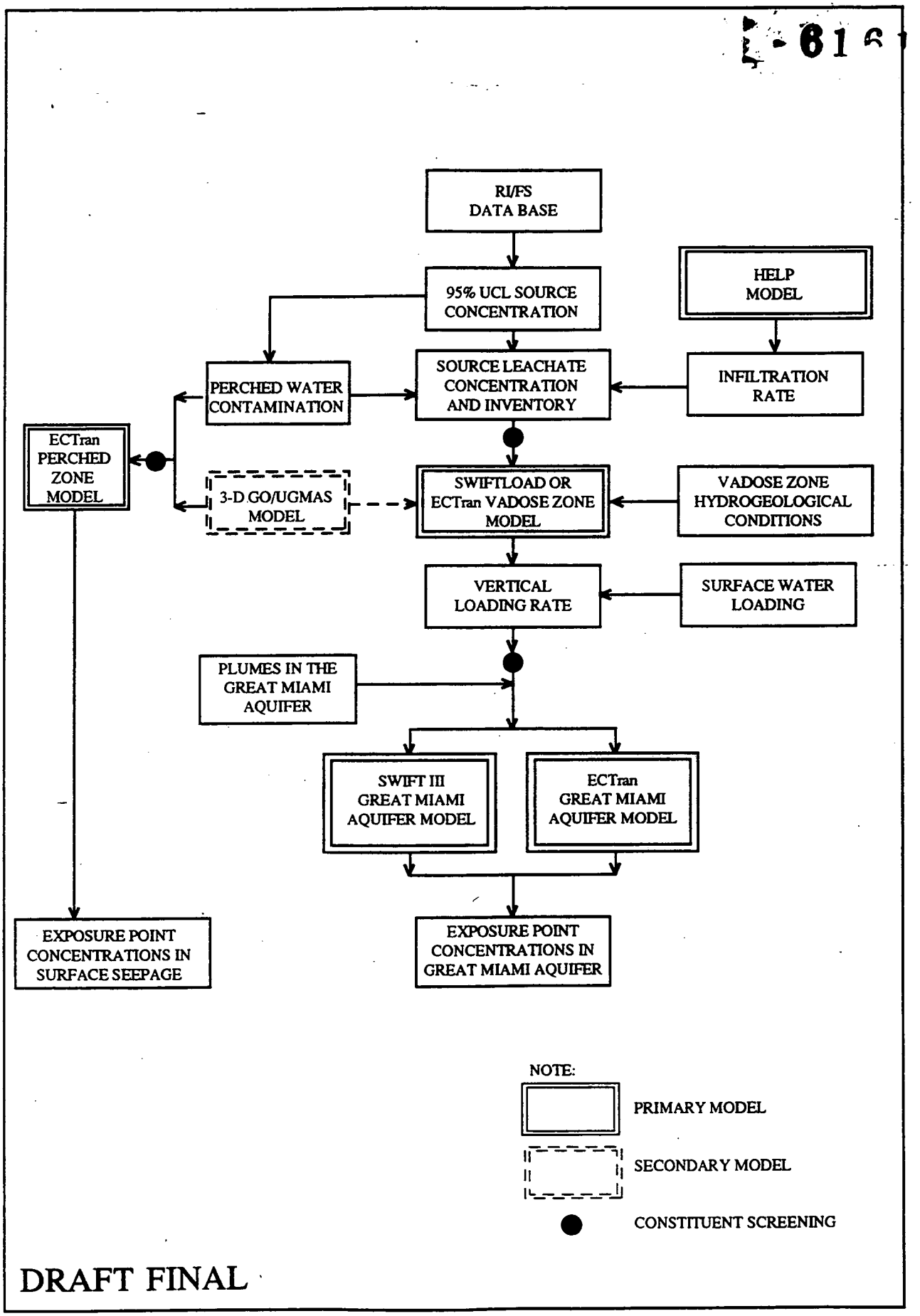


FIGURE F.3.3-1. ANALYTICAL AND NUMERICAL MODELS USED TO REPRESENT CONTAMINANT TRANSPORT PROCESSES



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*\ILL\SOU-5\PO--113\GW MODELS.EPS

FIGURE F.3.3-2. GROUNDWATER MODELS AND MODELING PROCEDURE

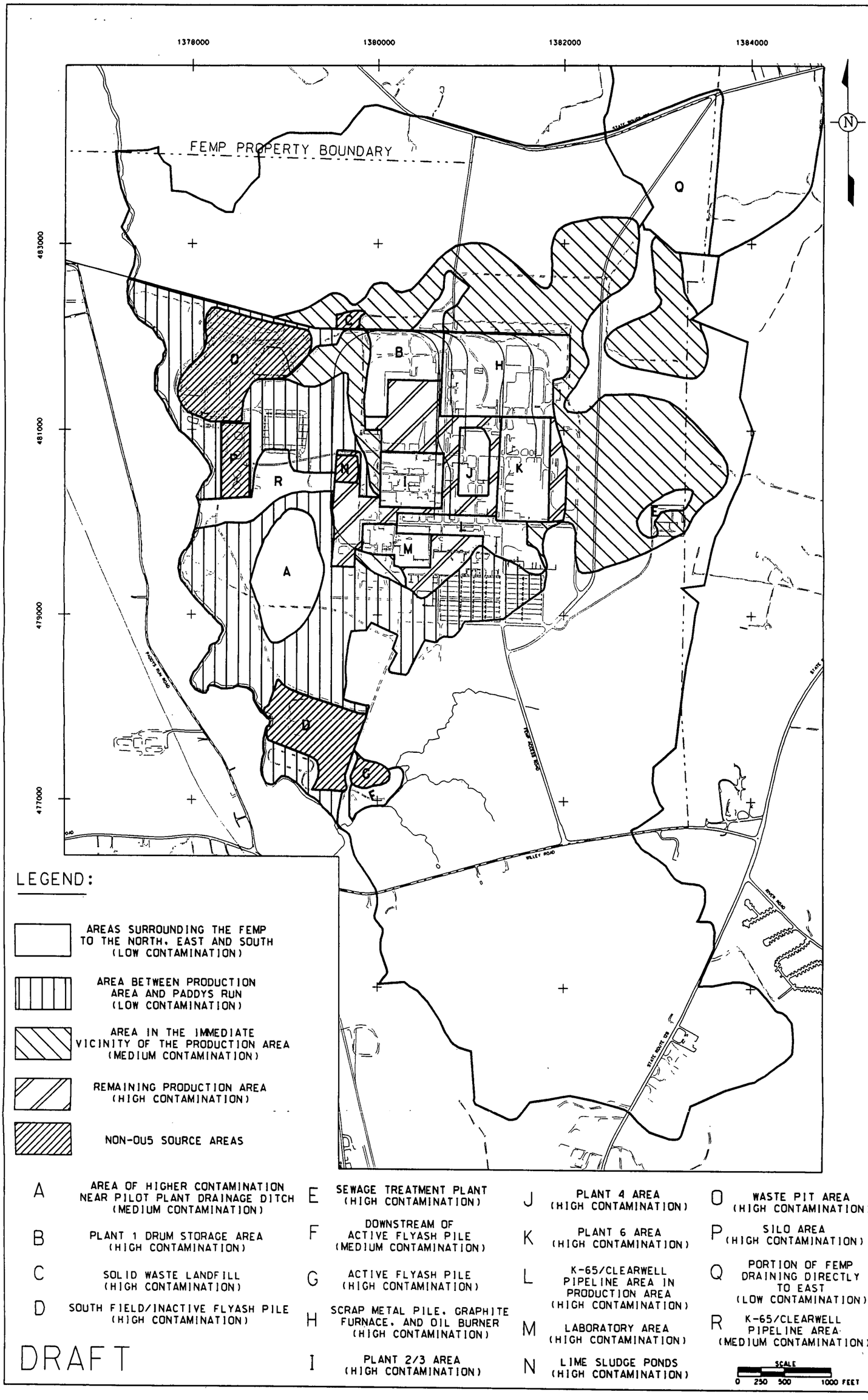


FIGURE F.3.4-1. CONTAMINANT SOURCE AREAS

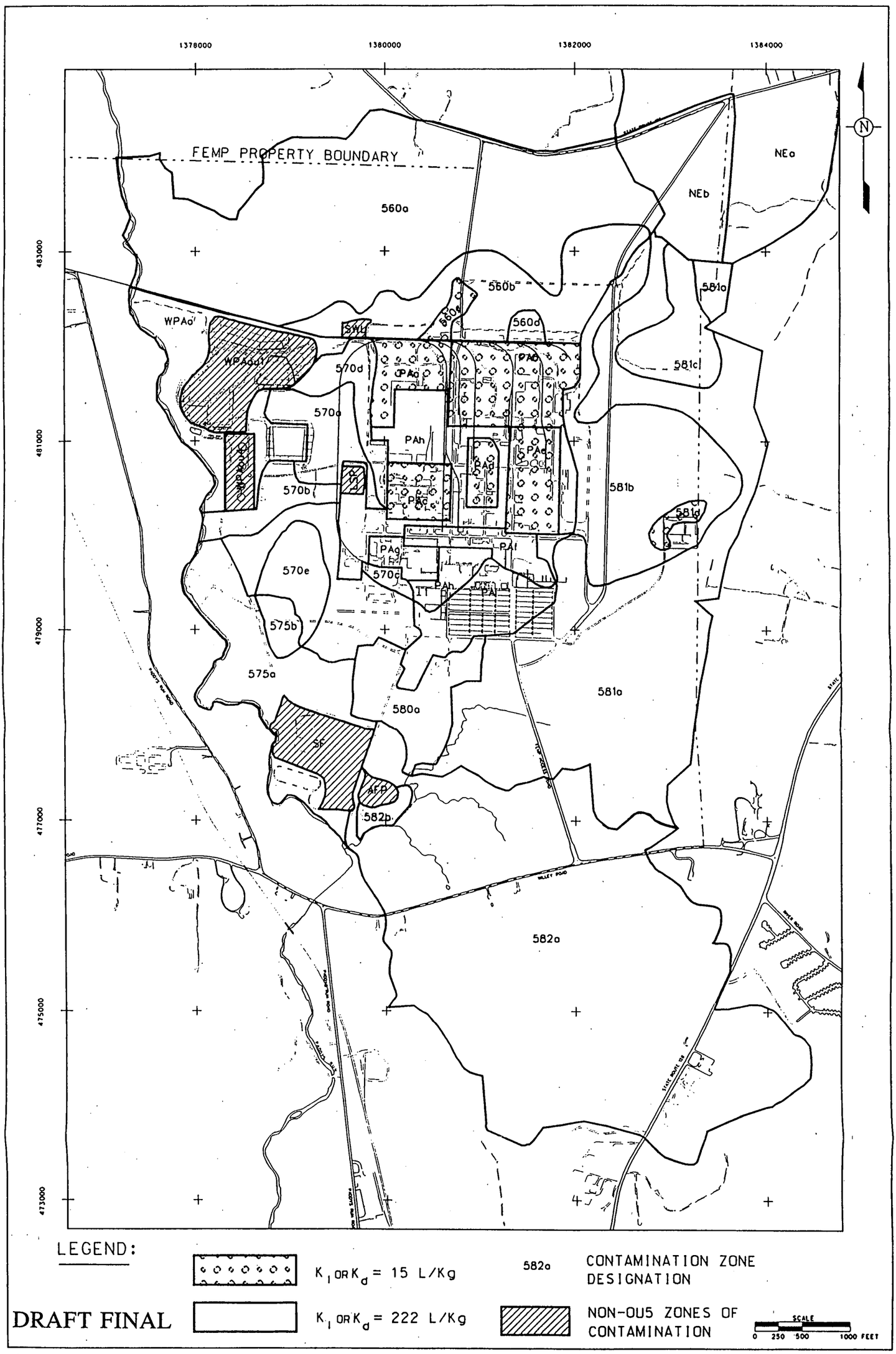
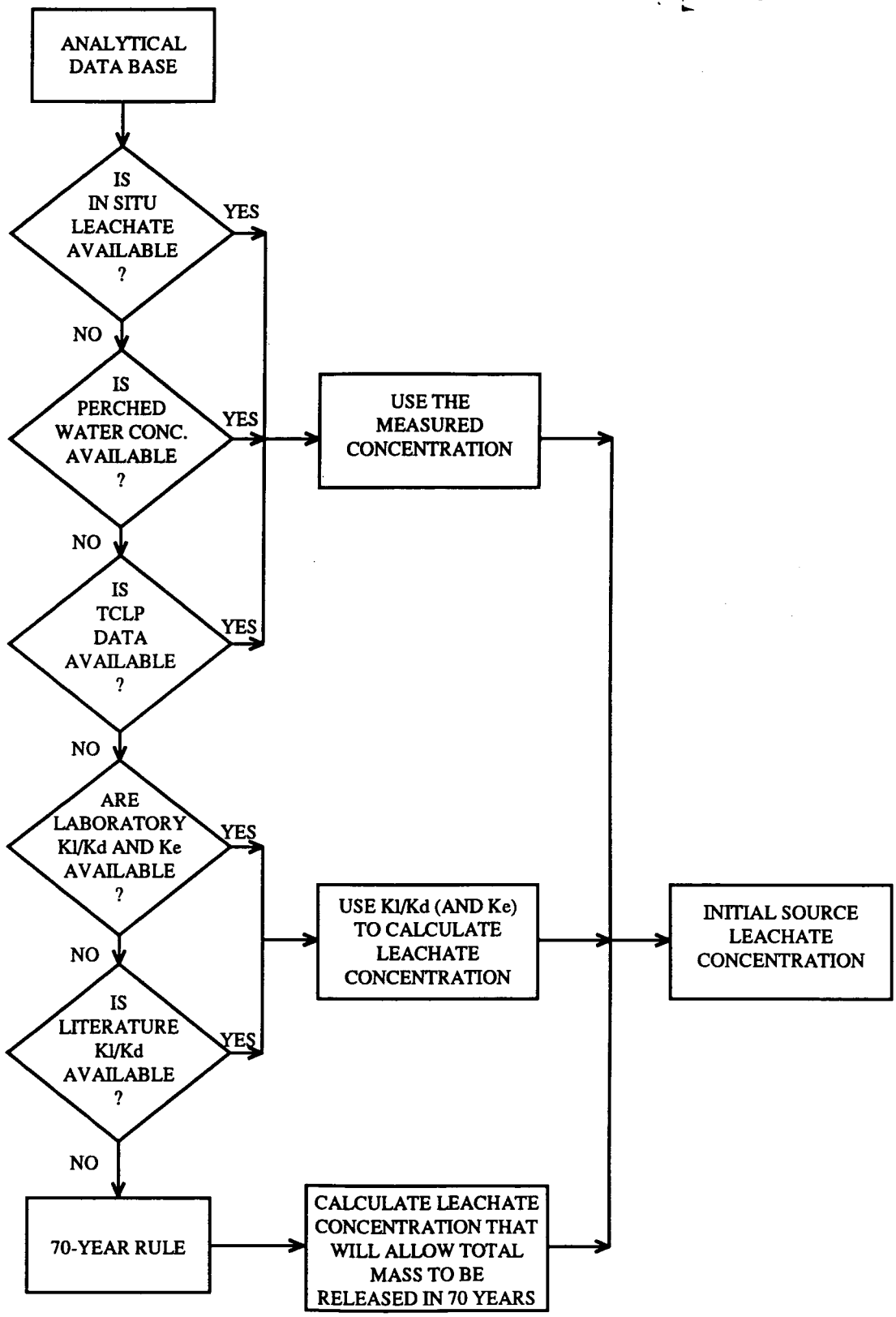


FIGURE F.3.4-2. ZONES OF URANIUM K_I OR K_d VALUES



*ILLUS\OU-5\PO-116\SOURCE LEACH.EPS

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FIGURE F.3.4-3. SOURCE LEACHATE CONCENTRATION ESTIMATION

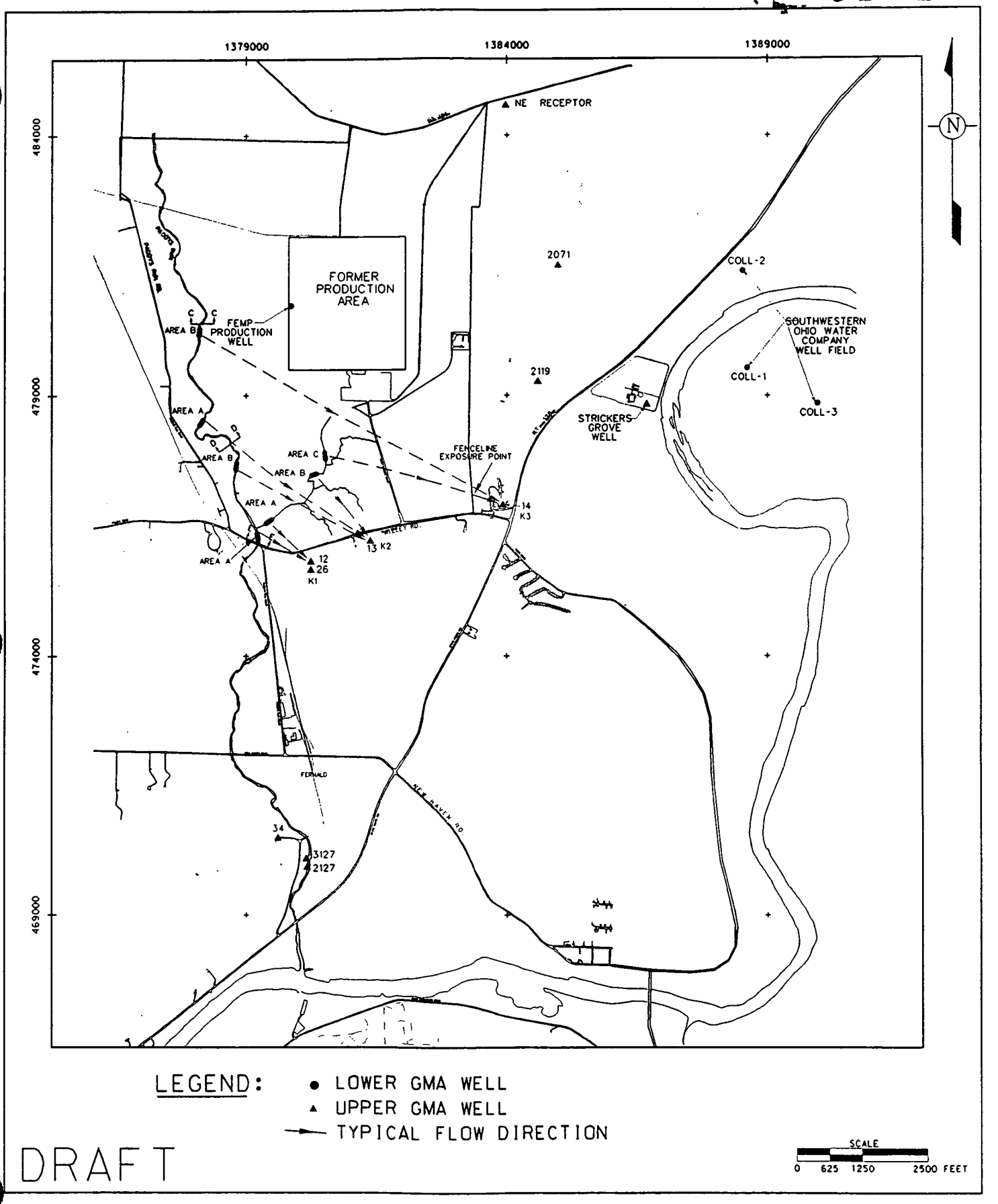


FIGURE F.3.4-4. TYPICAL CONTAMINANT MIGRATION PATHWAYS FROM SURFACE WATER SOURCES TO POTENTIAL OPERABLUE UNIT 5 REMEDIAL INVESTIGATION RECEPTORS

*\\ILLUS\OU-5\PO-116\P&TFLOW-TEXT-A.EPS

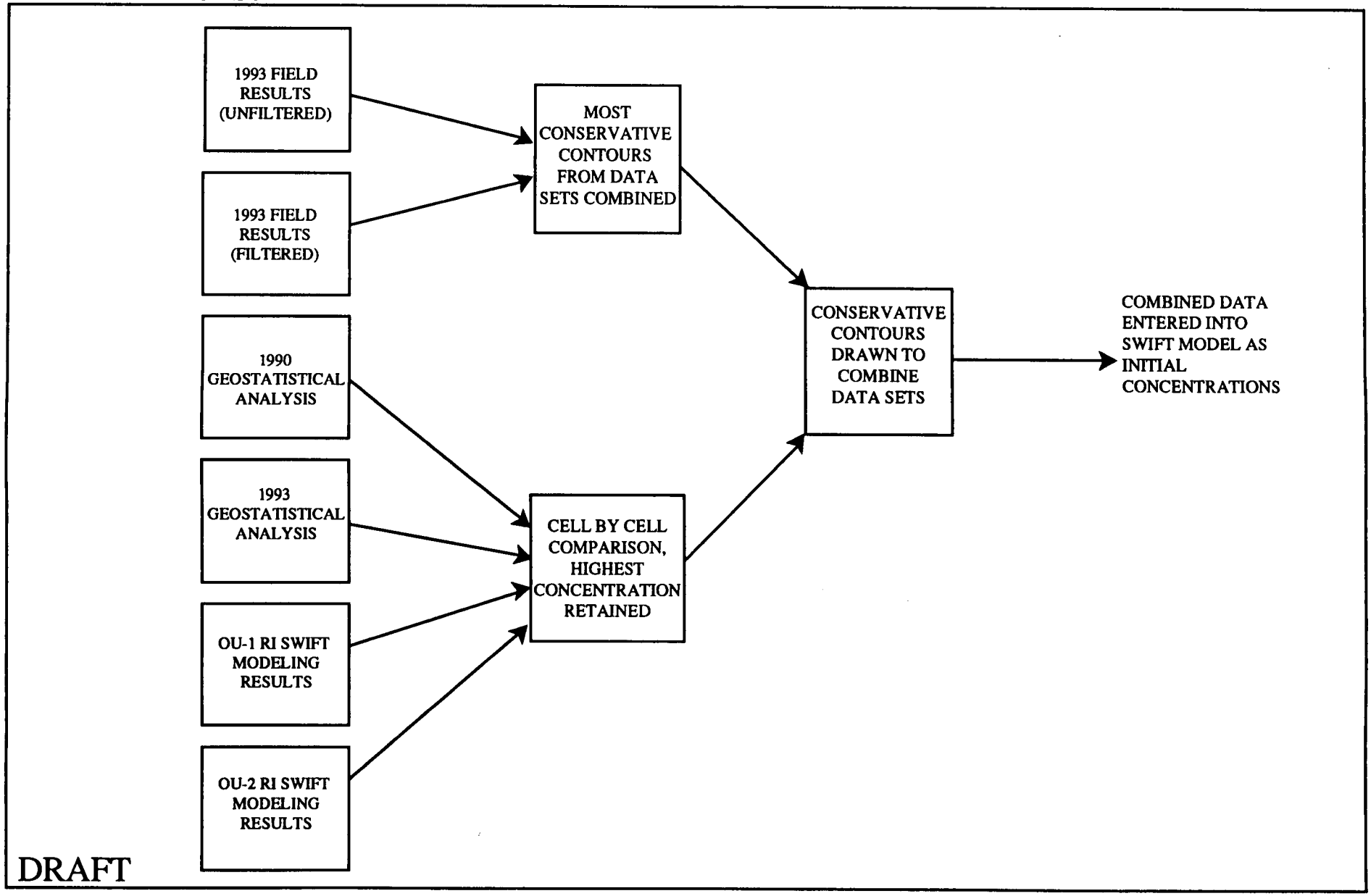


FIGURE F.3.4-5. DEVELOPMENT OF INITIAL URANIUM CONCENTRATIONS

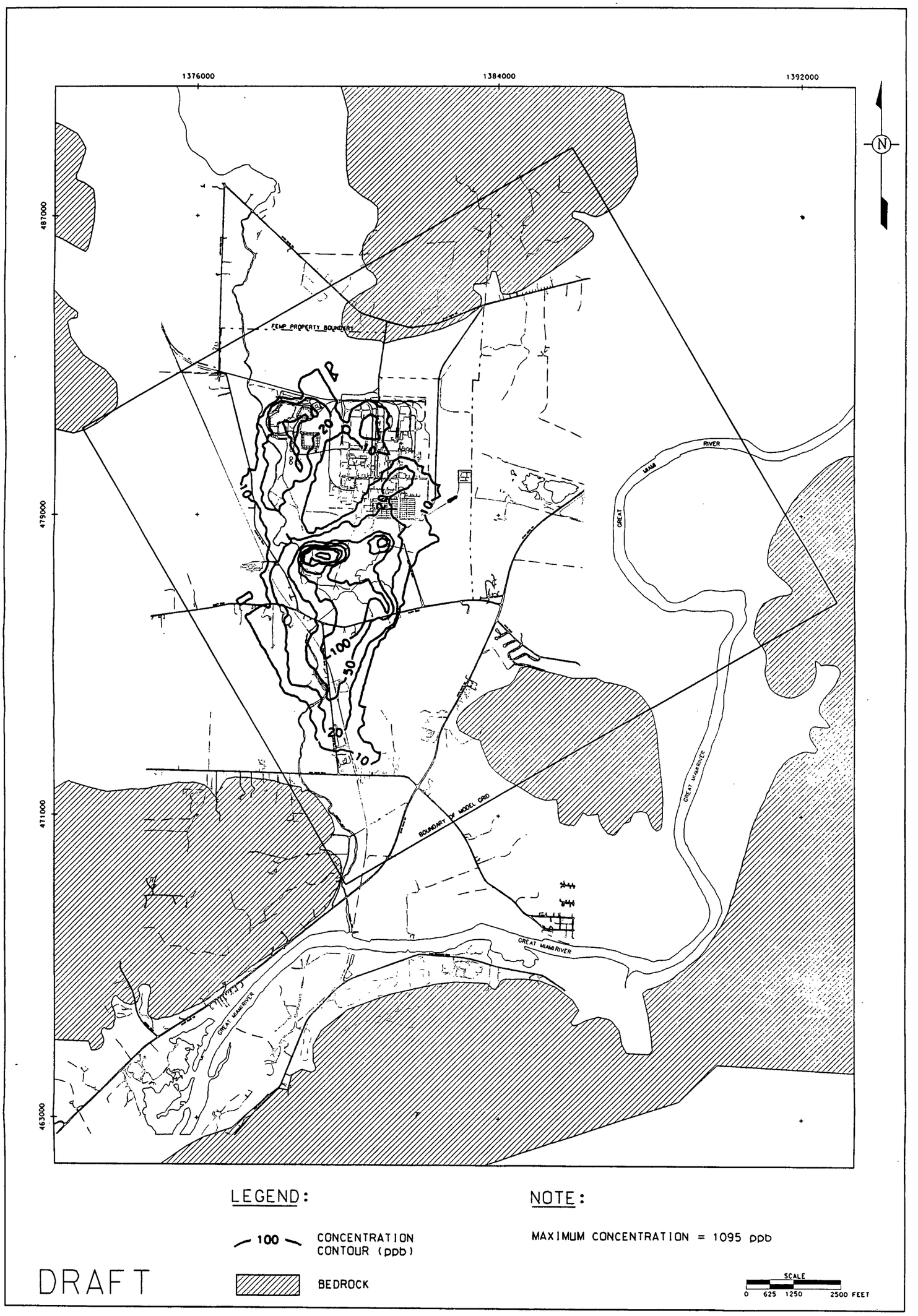


FIGURE F.3.4-6. INITIAL CONCENTRATION OF TOTAL URANIUM FOR SWIFT GREAT MIAMI AQUIFER MODELING (LAYER 1)

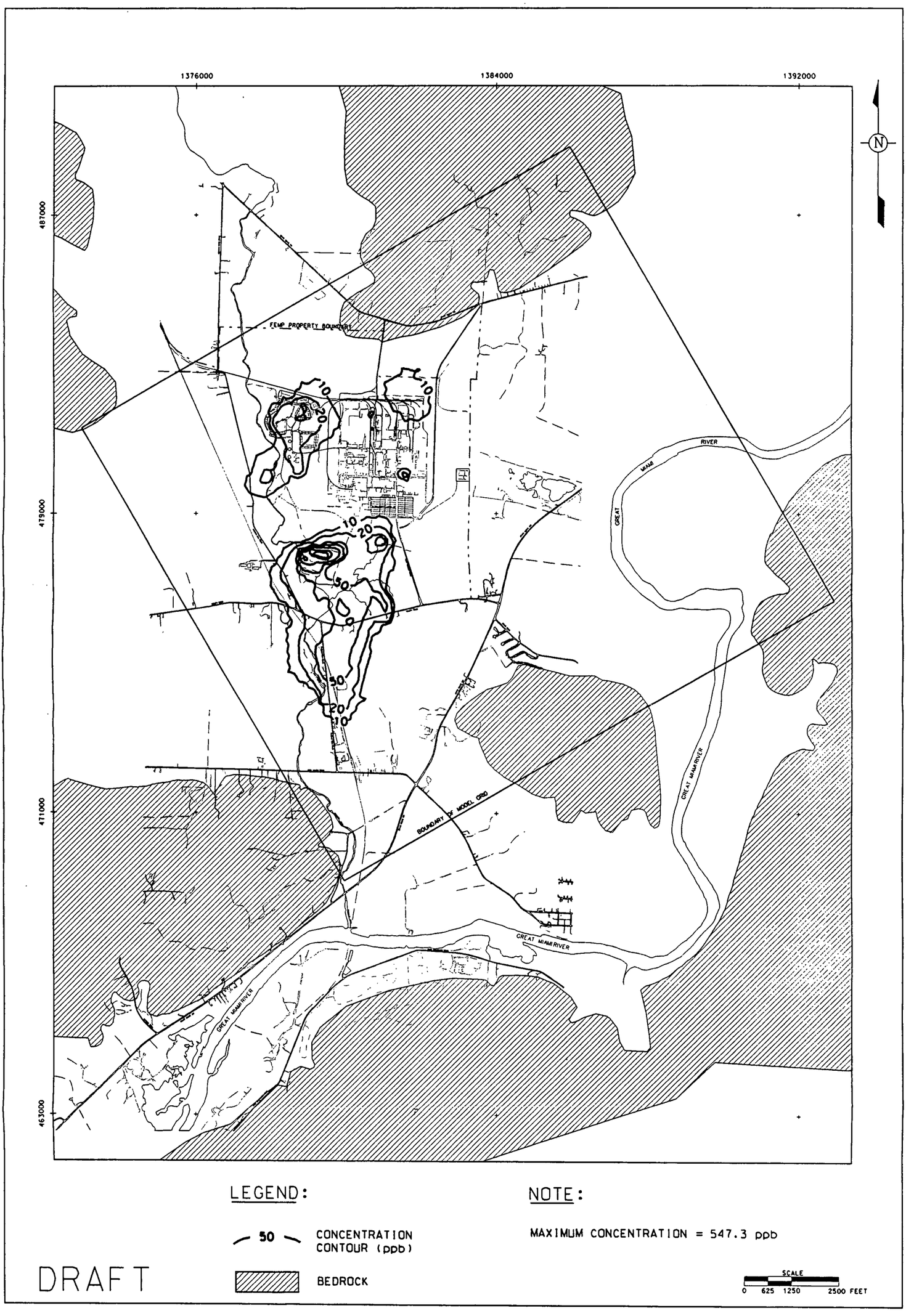


FIGURE F.3.4-7. INITIAL CONCENTRATION OF TOTAL URANIUM FOR SWIFT GREAT MIAMI AQUIFER MODELING (LAYER 2)

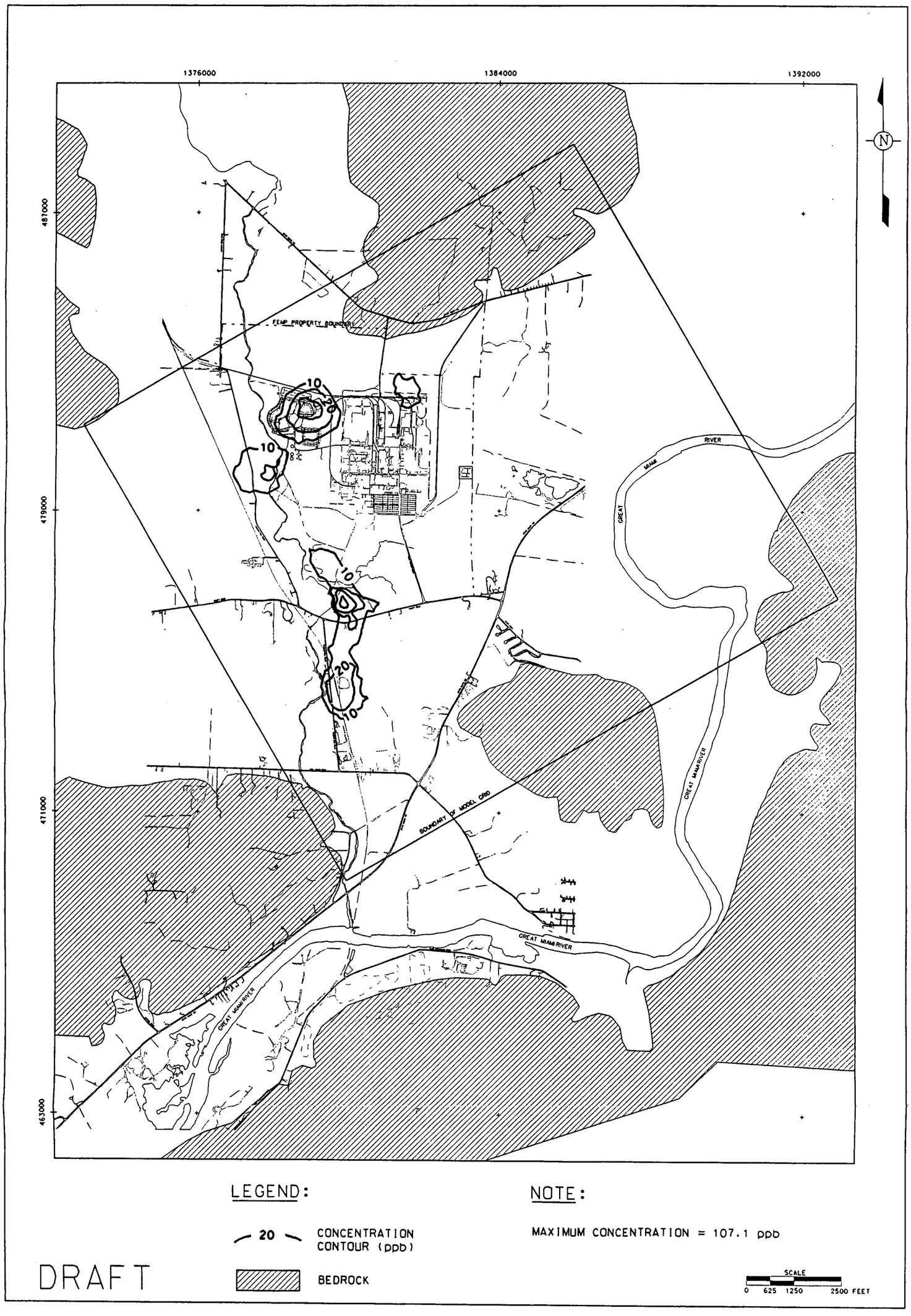


FIGURE F.3.4-8. INITIAL CONCENTRATION OF TOTAL URANIUM FOR SWIFT GREAT MIAMI AQUIFER MODELING (LAYER 3)

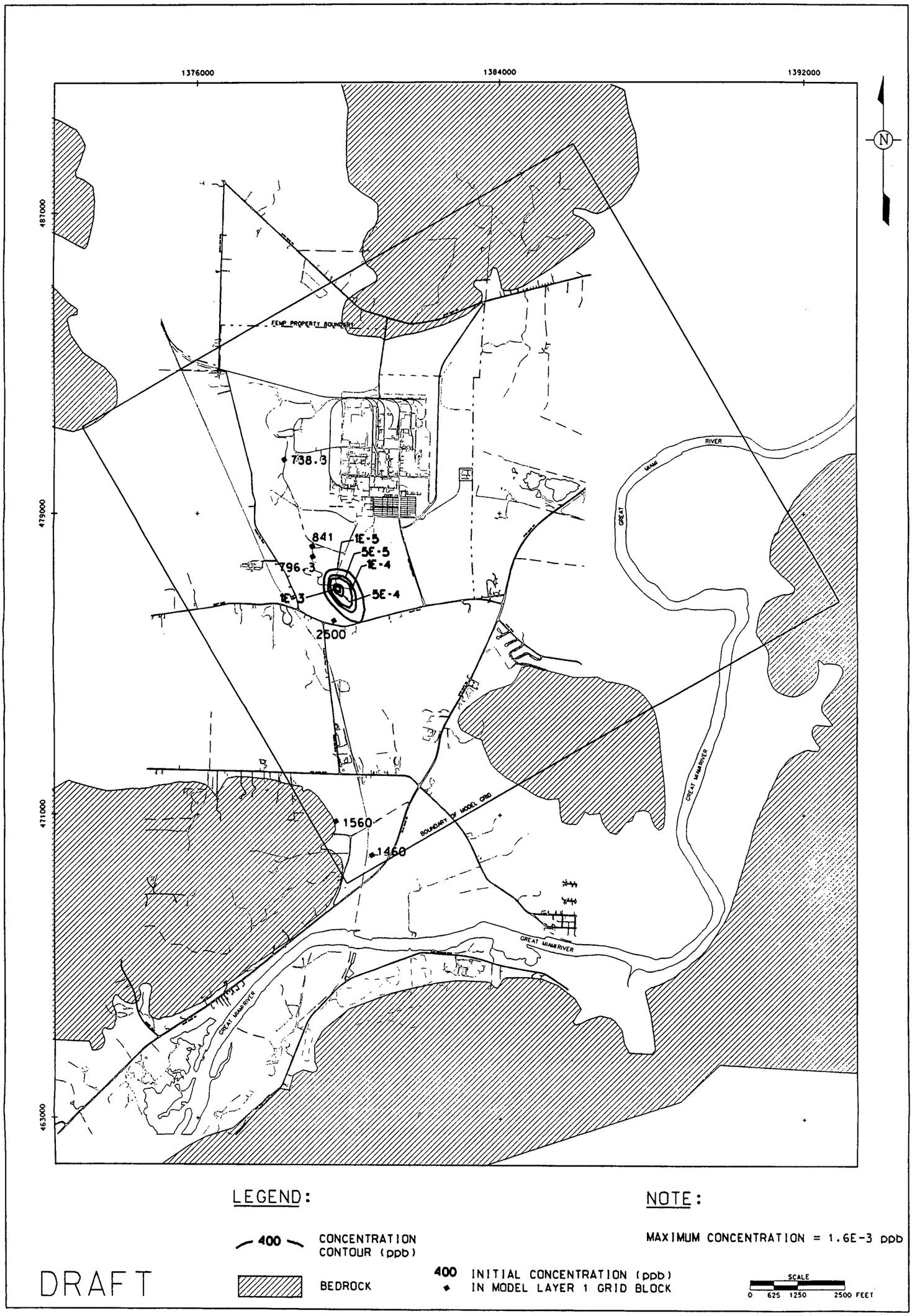


FIGURE F.3.4-9. INITIAL CONCENTRATION OF NP-237 FOR SWIFT GREAT MIAMI AQUIFER MODELING

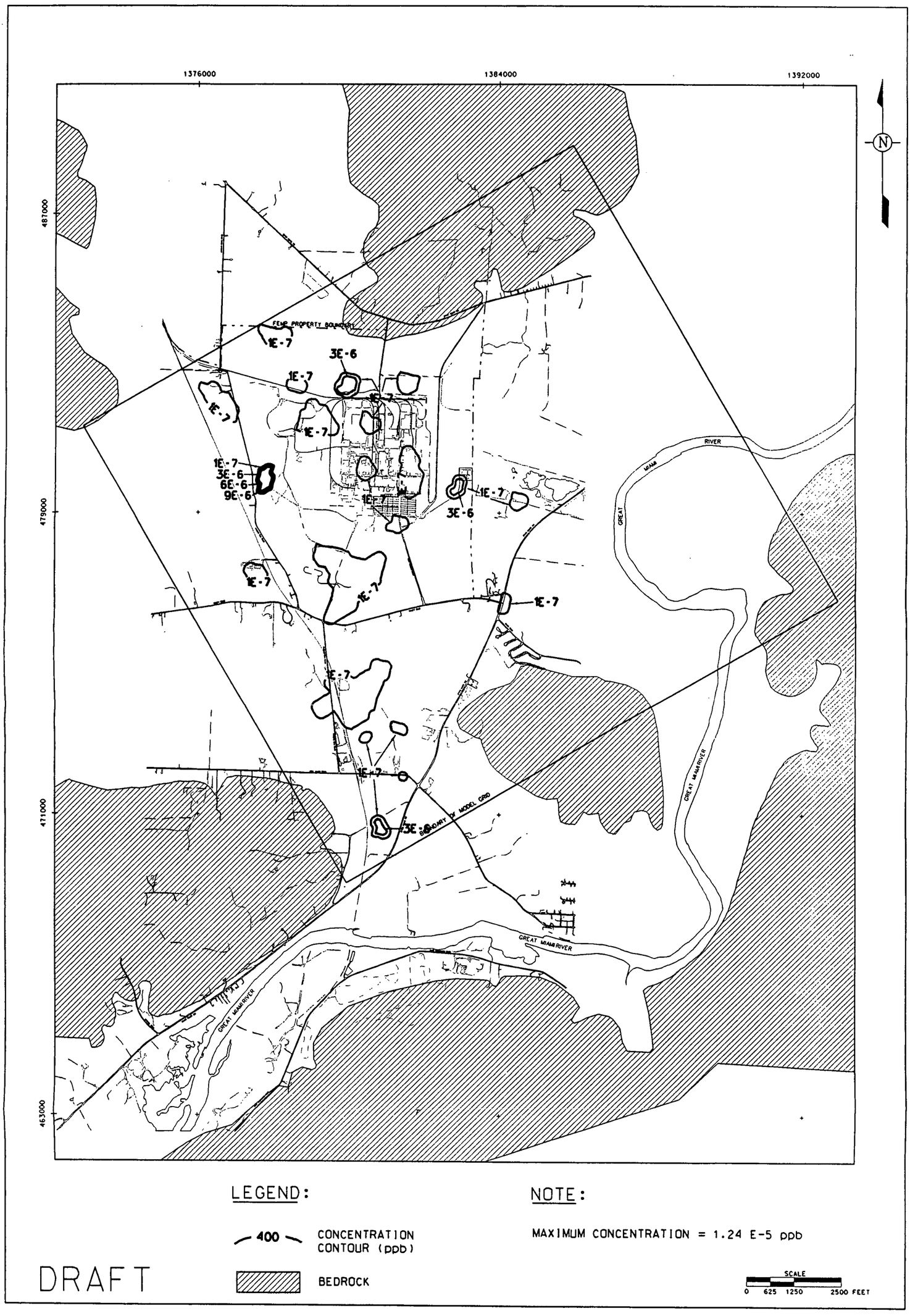


FIGURE F.3.4-10. INITIAL CONCENTRATION OF RA-226 FOR SWIFT GREAT MIAMI AQUIFER MODELING

000099

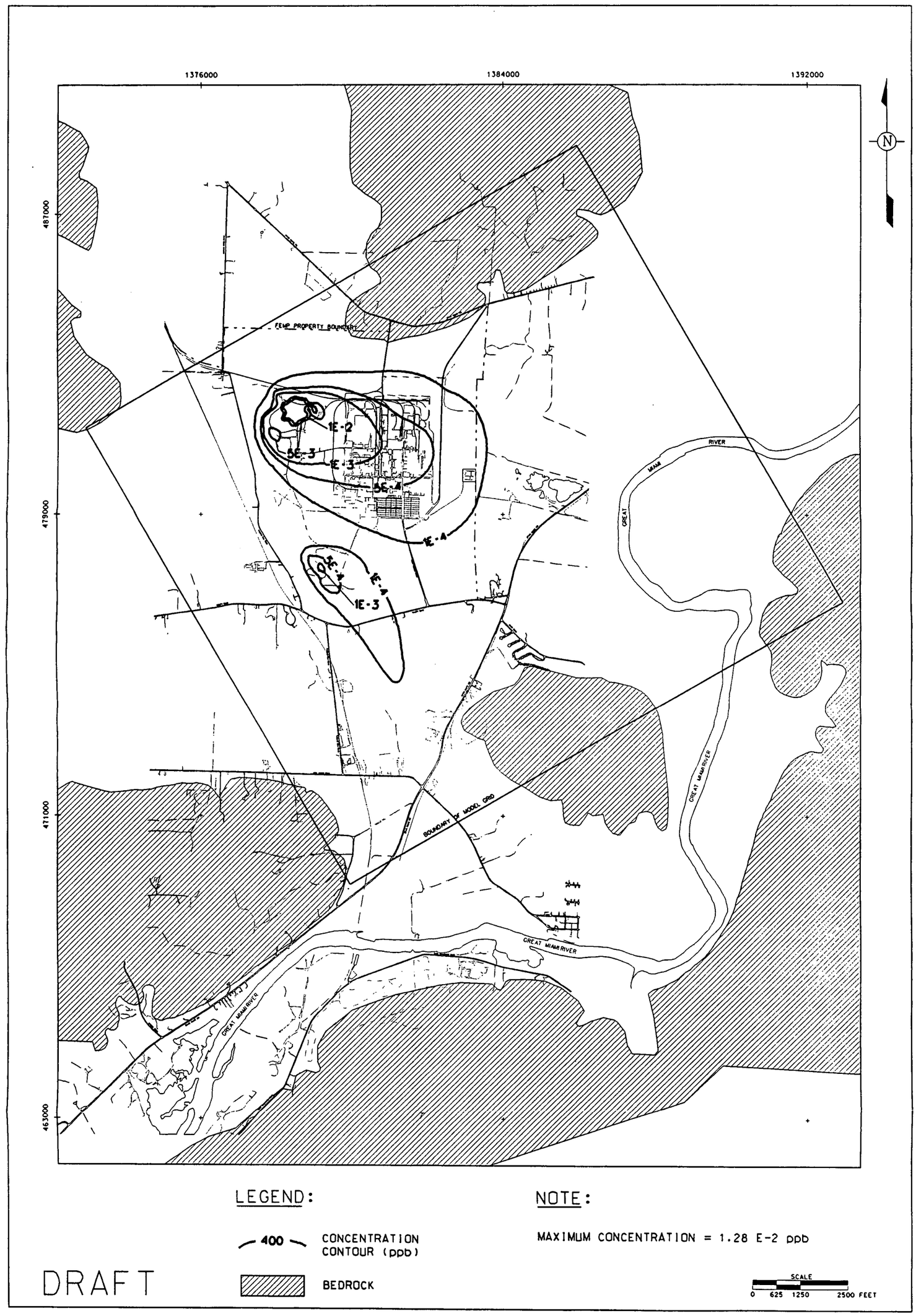


FIGURE F.3.4-11. INITIAL CONCENTRATION OF TC-99 FOR SWIFT GREAT MIAMI AQUIFER MODELING

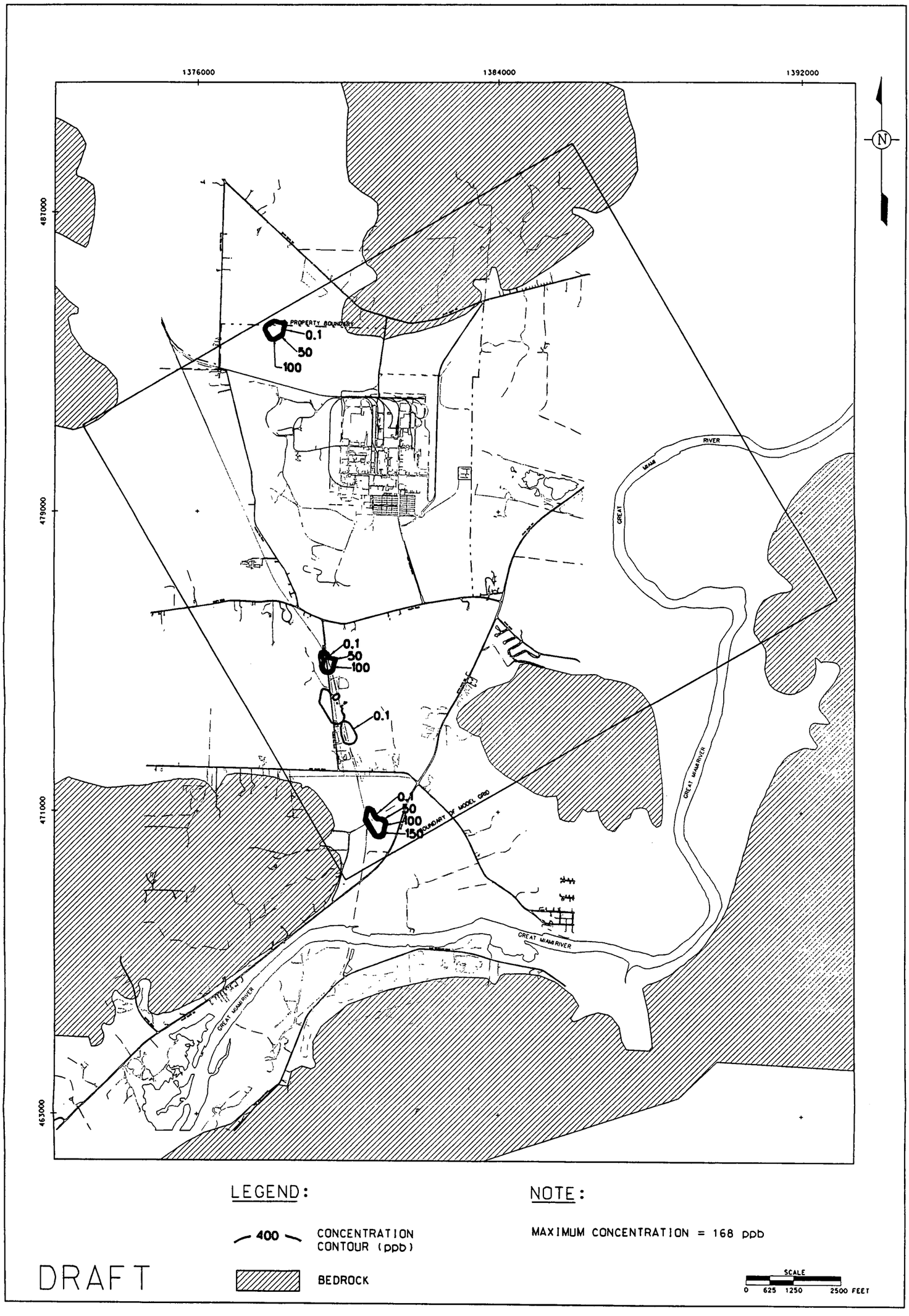


FIGURE F.3.4-12. INITIAL CONCENTRATION OF ARSENIC FOR SWIFT GREAT MIAMI AQUIFER MODELING

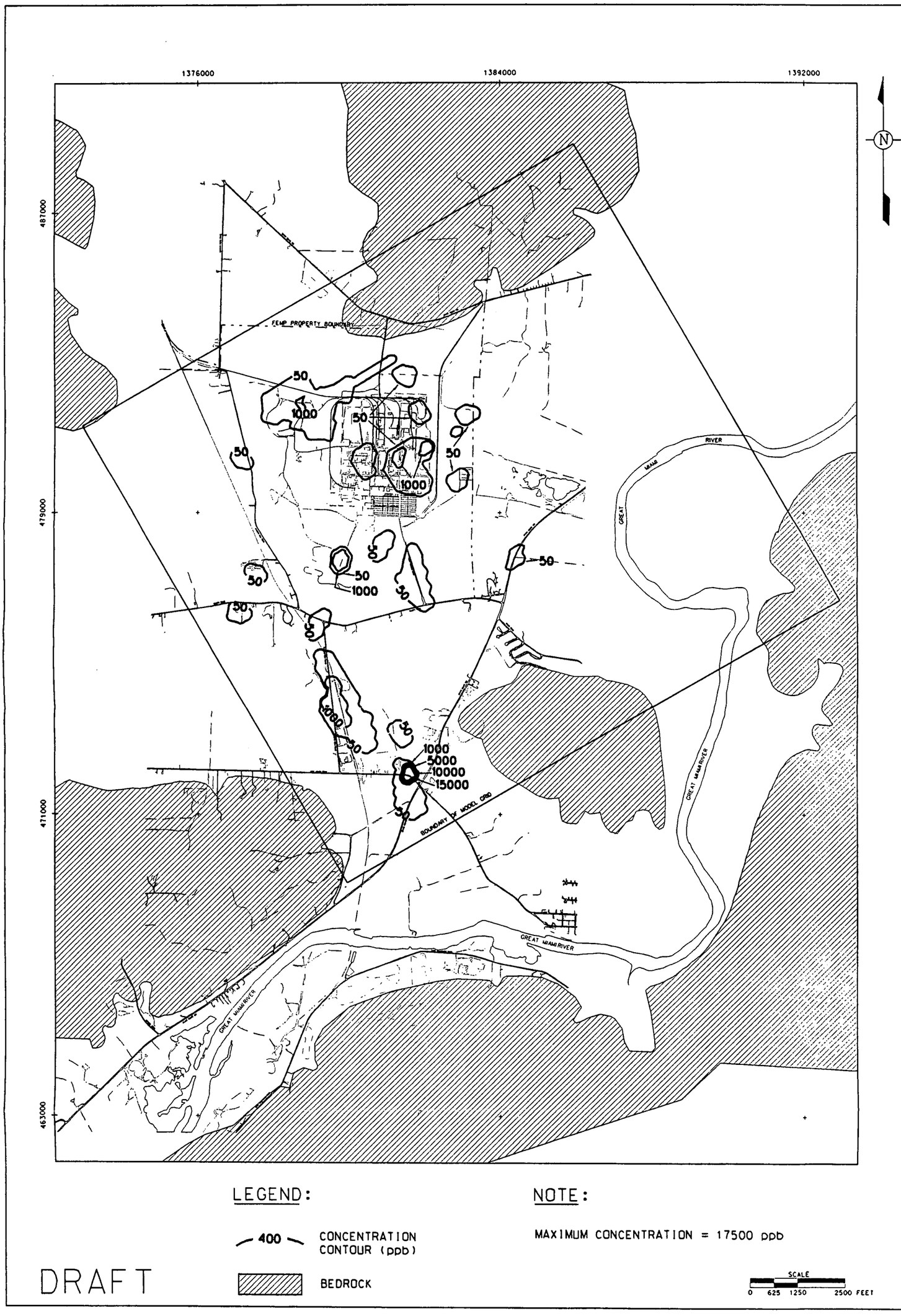
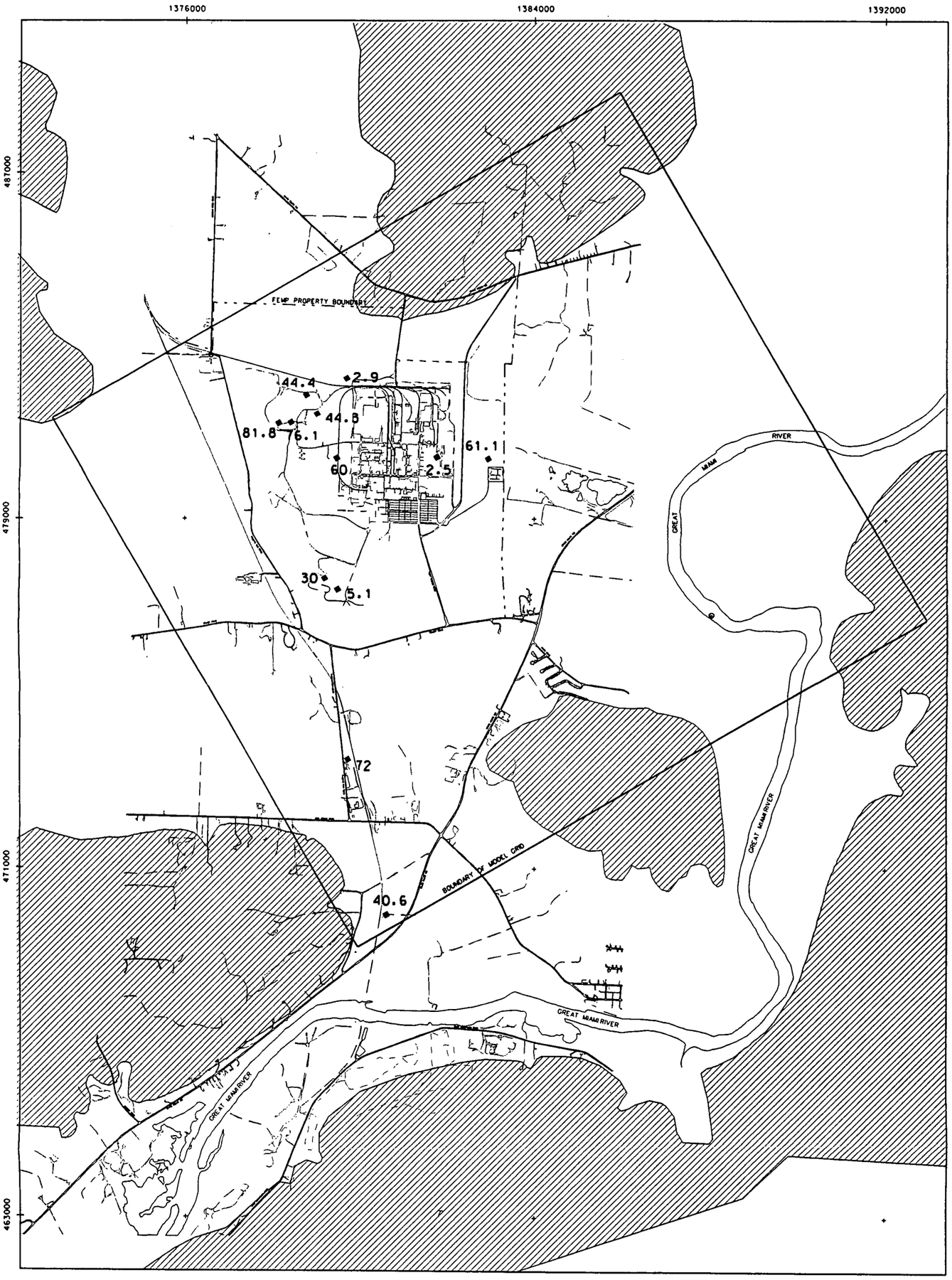


FIGURE F.3.4-13. INITIAL CONCENTRATION OF MANGANESE FOR SWIFT GREAT MIAMI AQUIFER MODELING



LEGEND:

400 CONCENTRATION CONTOUR (ppb)

BEDROCK

400 INITIAL CONCENTRATION (ppb) IN MODEL LAYER 1 GRID BLOCK

NOTE:

MAXIMUM CONCENTRATION = 81.8 ppb

SCALE 0 625 1250 2500 FEET

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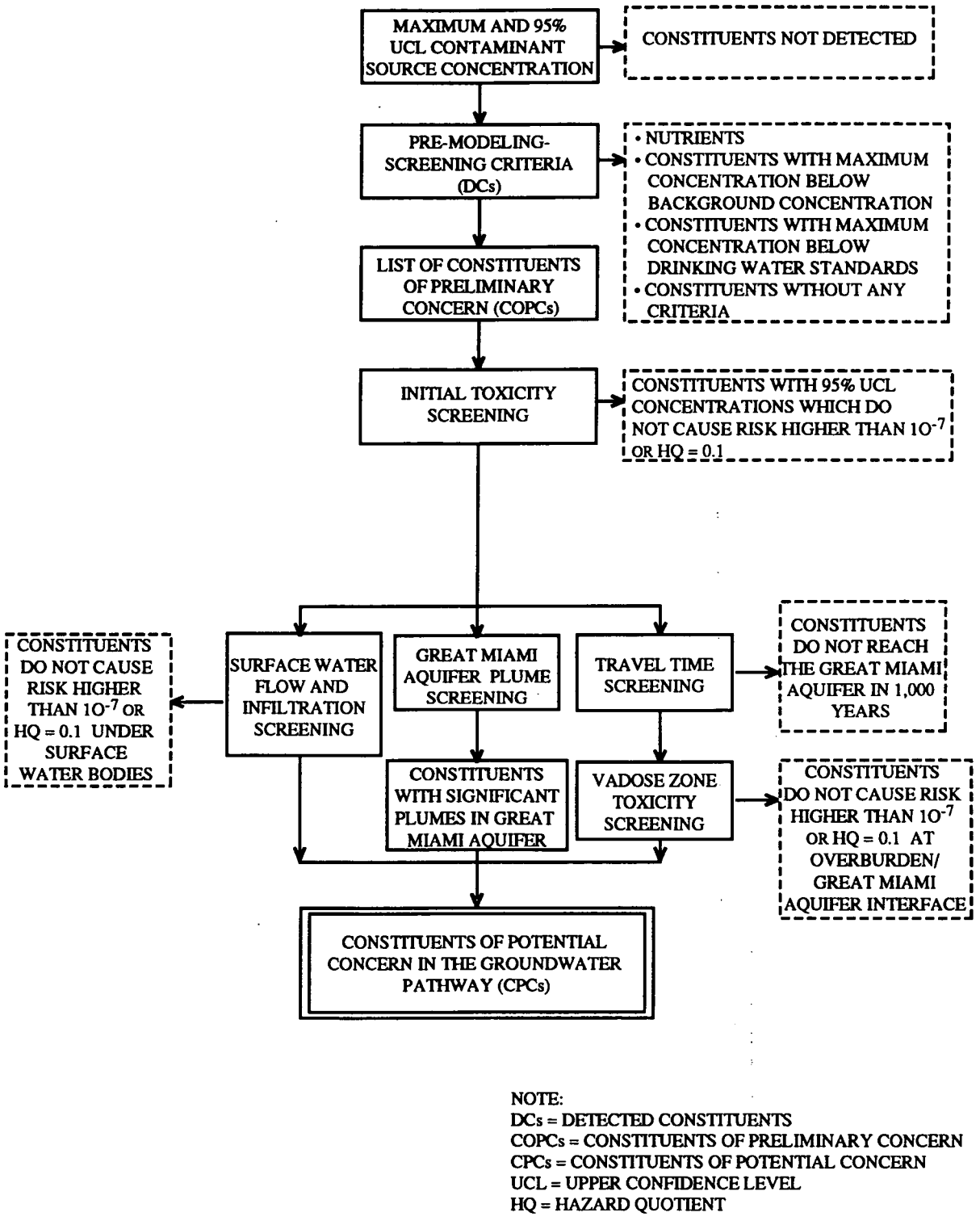
FIGURE F.3.4-14. INITIAL CONCENTRATION OF ANTIMONY FOR SWIFT GREAT MIAMI AQUIFER MODELING



NOTE:
DCs = DETECTED CONSTITUENTS
COPCs = CONSTITUENTS OF PRELIMINARY CONCERN
CPCs = CONSTITUENTS OF POTENTIAL CONCERN
UCL = UPPER CONFIDENCE LEVEL
HQ = HAZARD QUOTIENT

*ILLUSOU-SNPO-116\CONSTIT SCRN-GW.EPS

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FIGURE F.3.5-1. CONSTITUENT SCREENING PROCESS - GROUNDWATER PATHWAY

*ILLUS\OU-5\PO-116\CNCPT MOD SFC-GMA.EPS

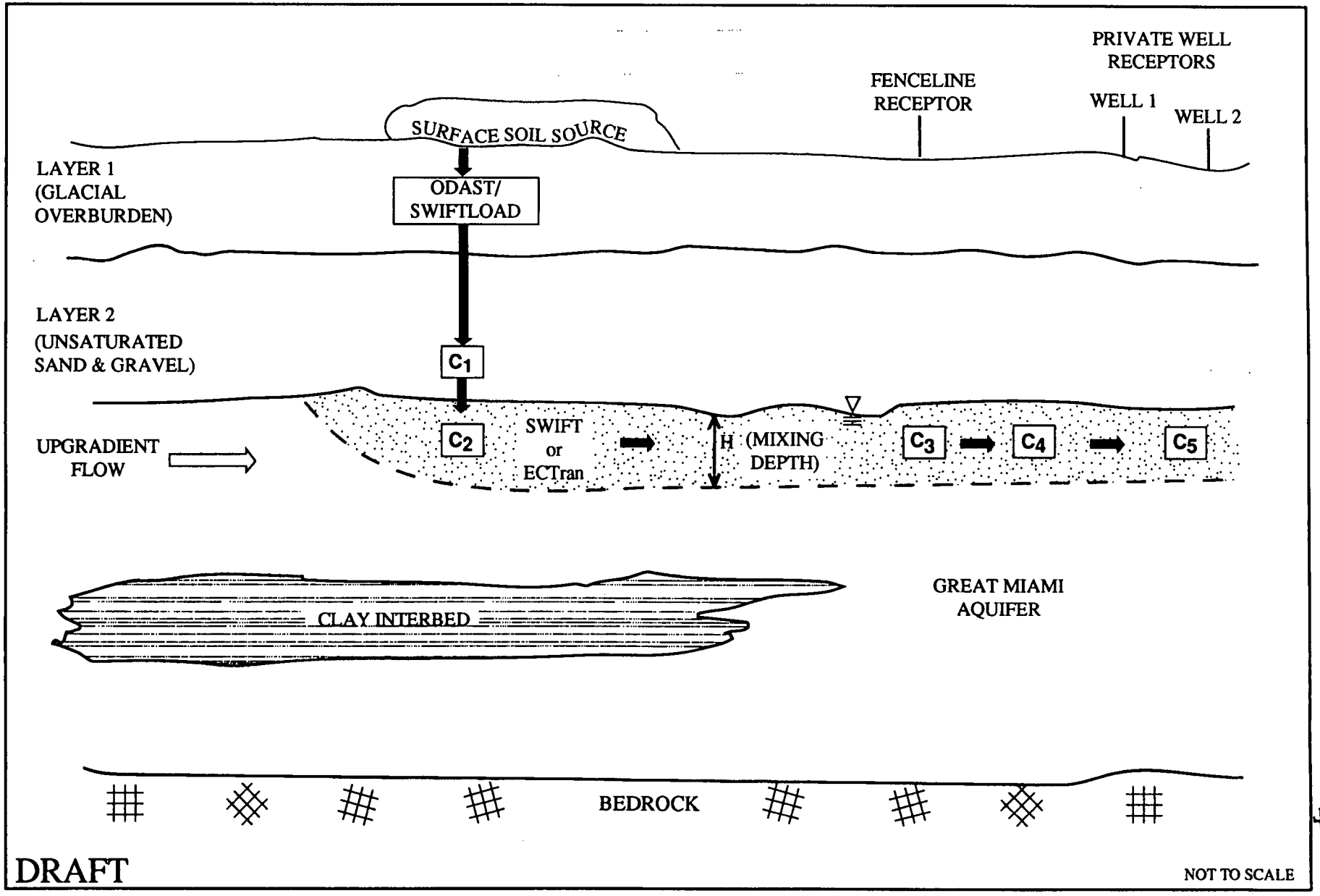

FIGURE F.3.5-2. CONCEPTUAL MODEL FOR CONTAMINANT LOADING FROM SURFACE SOIL TO THE GREAT MIAMI AQUIFER

*ILLUS\OU-5\PO-116\CNCPT VERT CONTAM.EPS

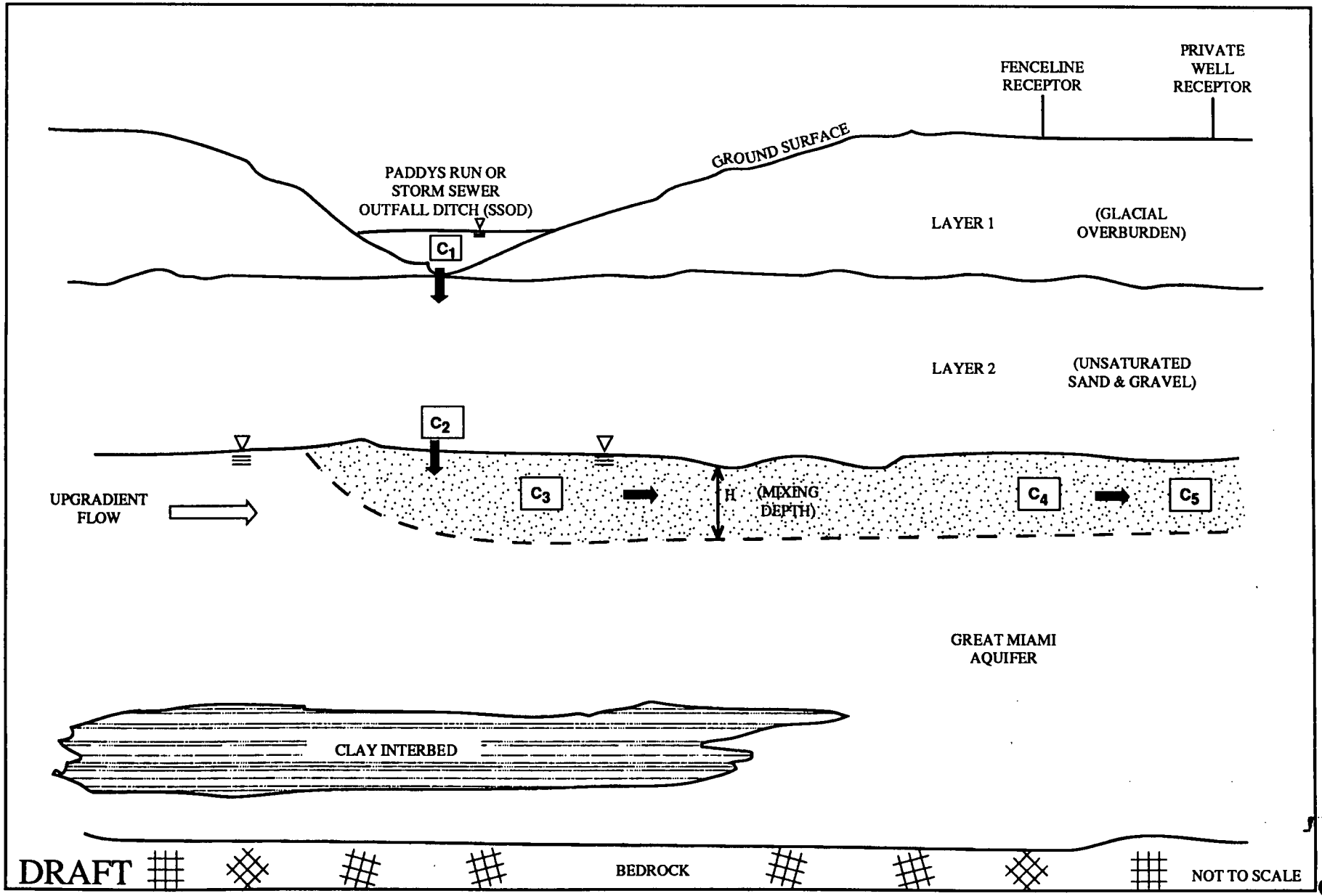

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FIGURE F.3.5-3. CONCEPTUAL MODEL FOR VERTICAL CONTAMINANT LOADING FROM SURFACE WATER TO THE GREAT MIAMI AQUIFER

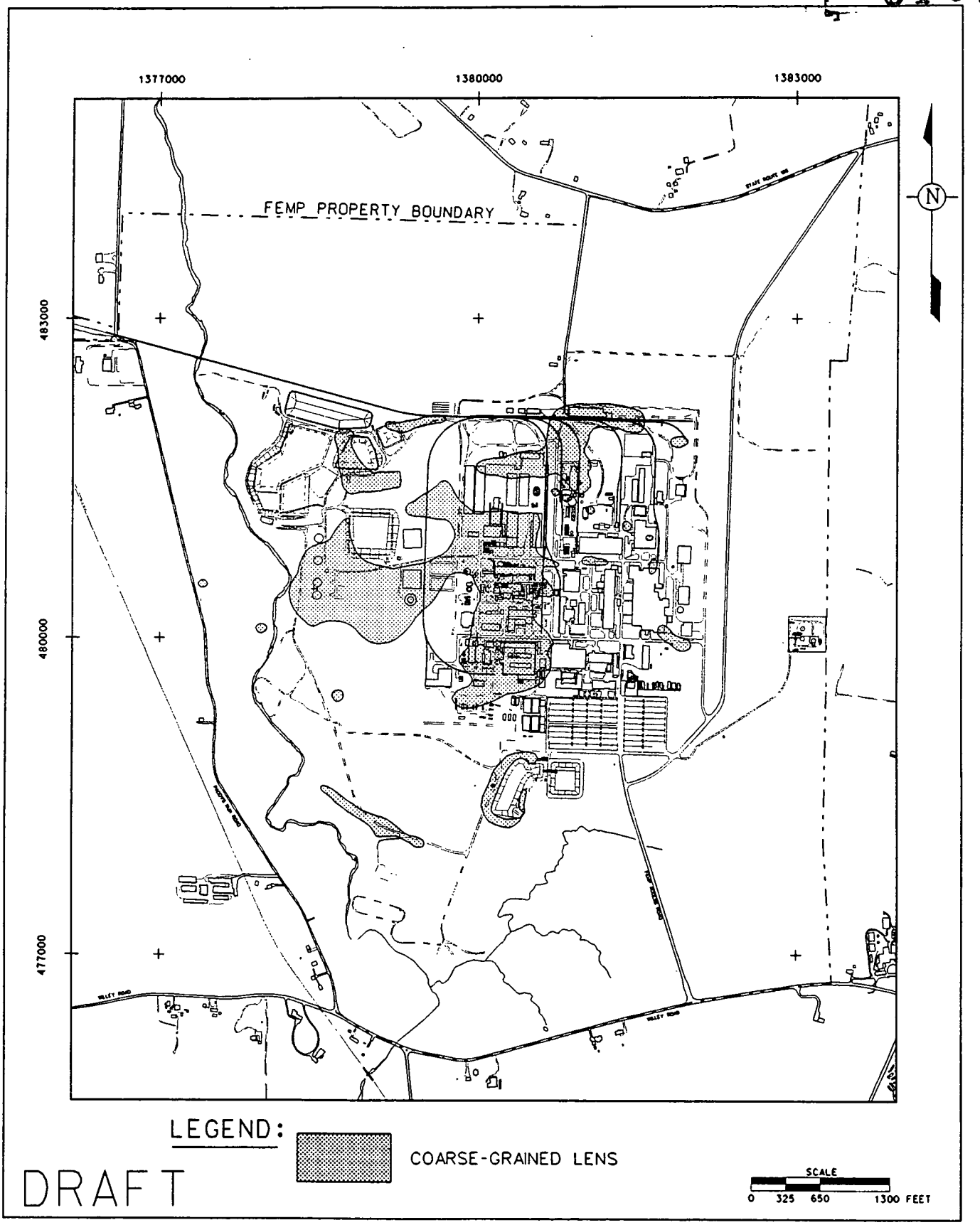


FIGURE F.3.6-1. COARSE-GRAINED SEDIMENT LENS

*\ILLUS\OU-5\PO-116\CNCPT MOD LATERAL.EPS

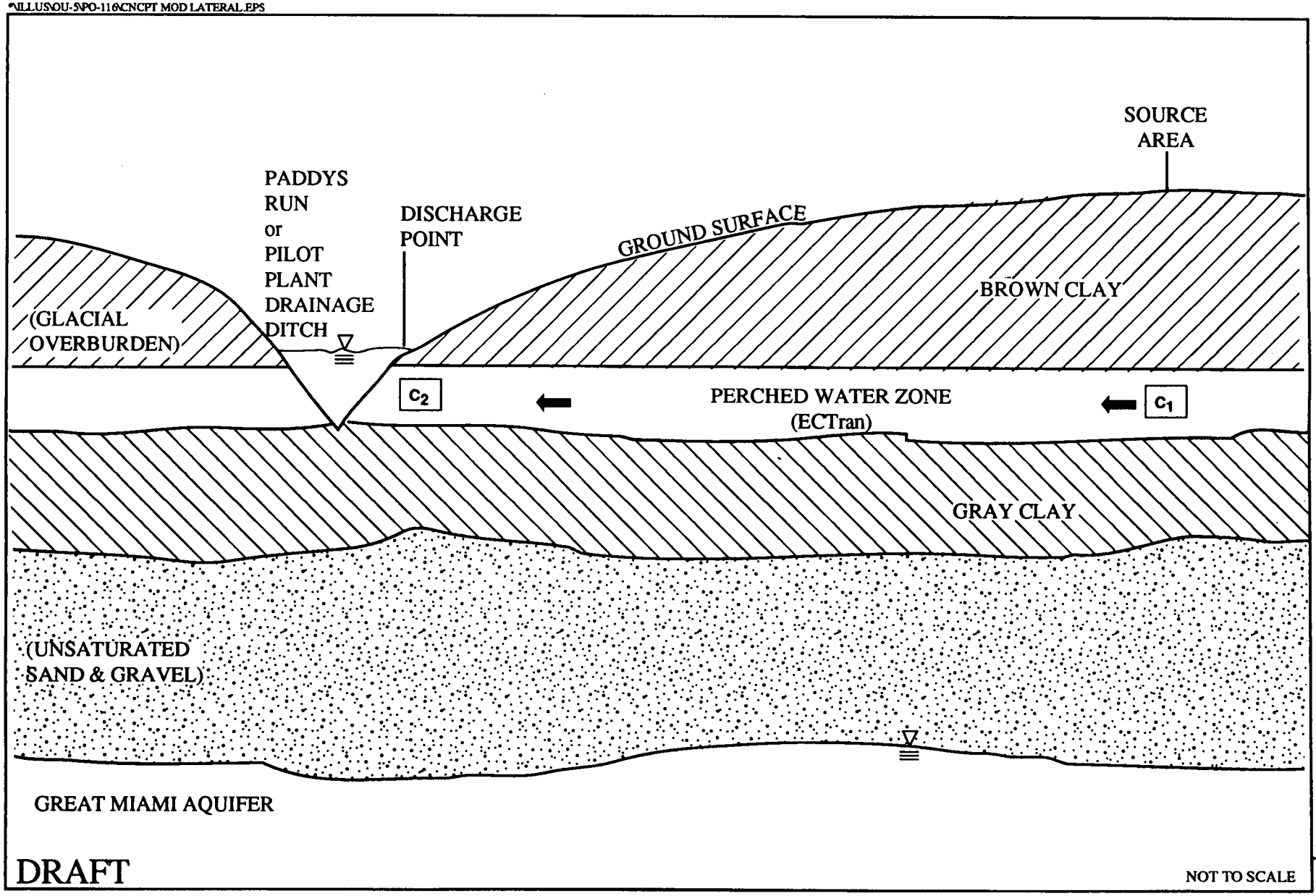
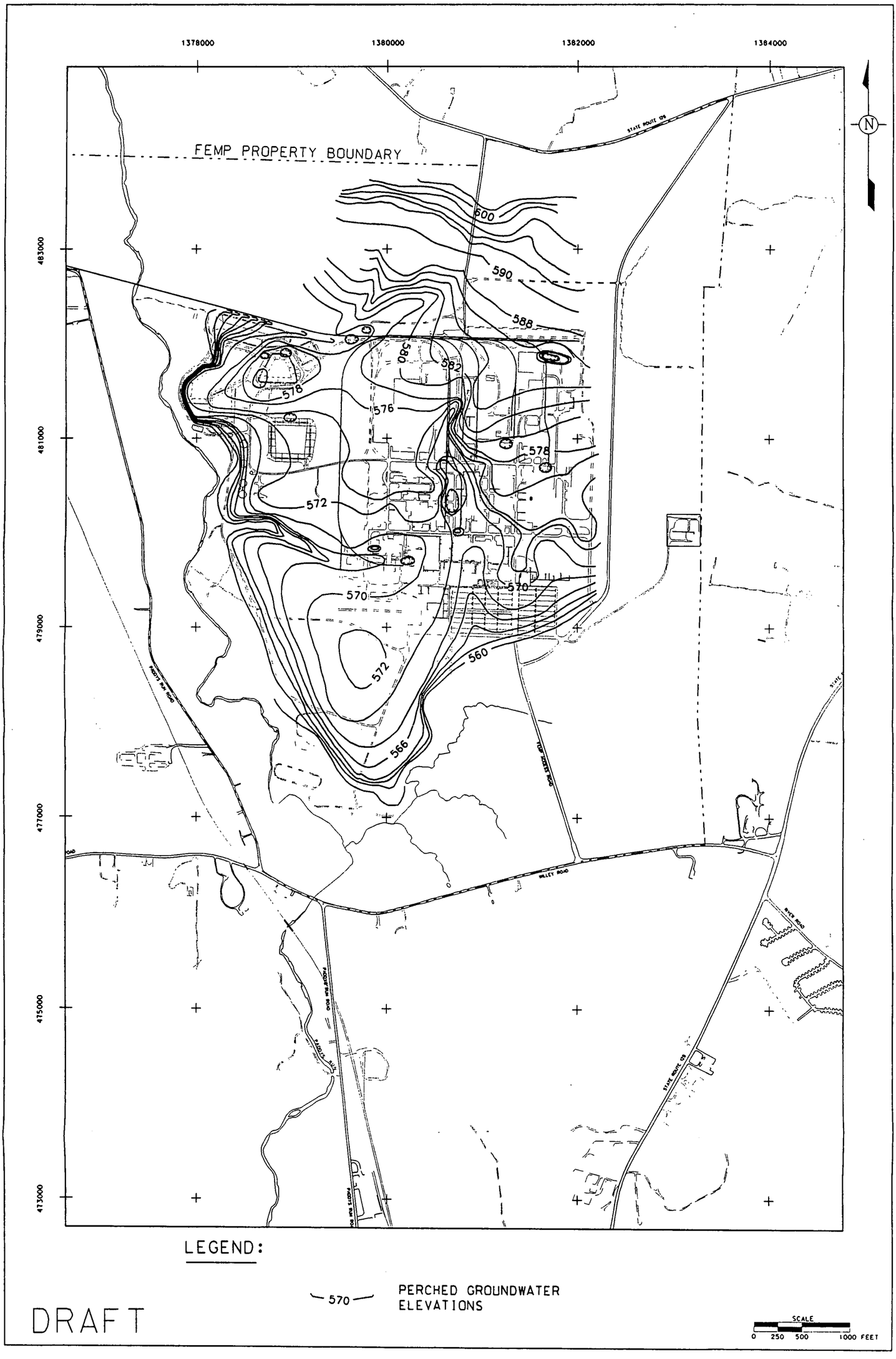


FIGURE F.3.6-2. CONCEPTUAL MODEL FOR LATERAL CONTAMINANT LOADING FROM PERCHED WATER TO SURFACE WATER



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P0116/SKX02945.DGN

FIGURE F.3.6-3. PERCHED GROUNDWATER CONTOURS

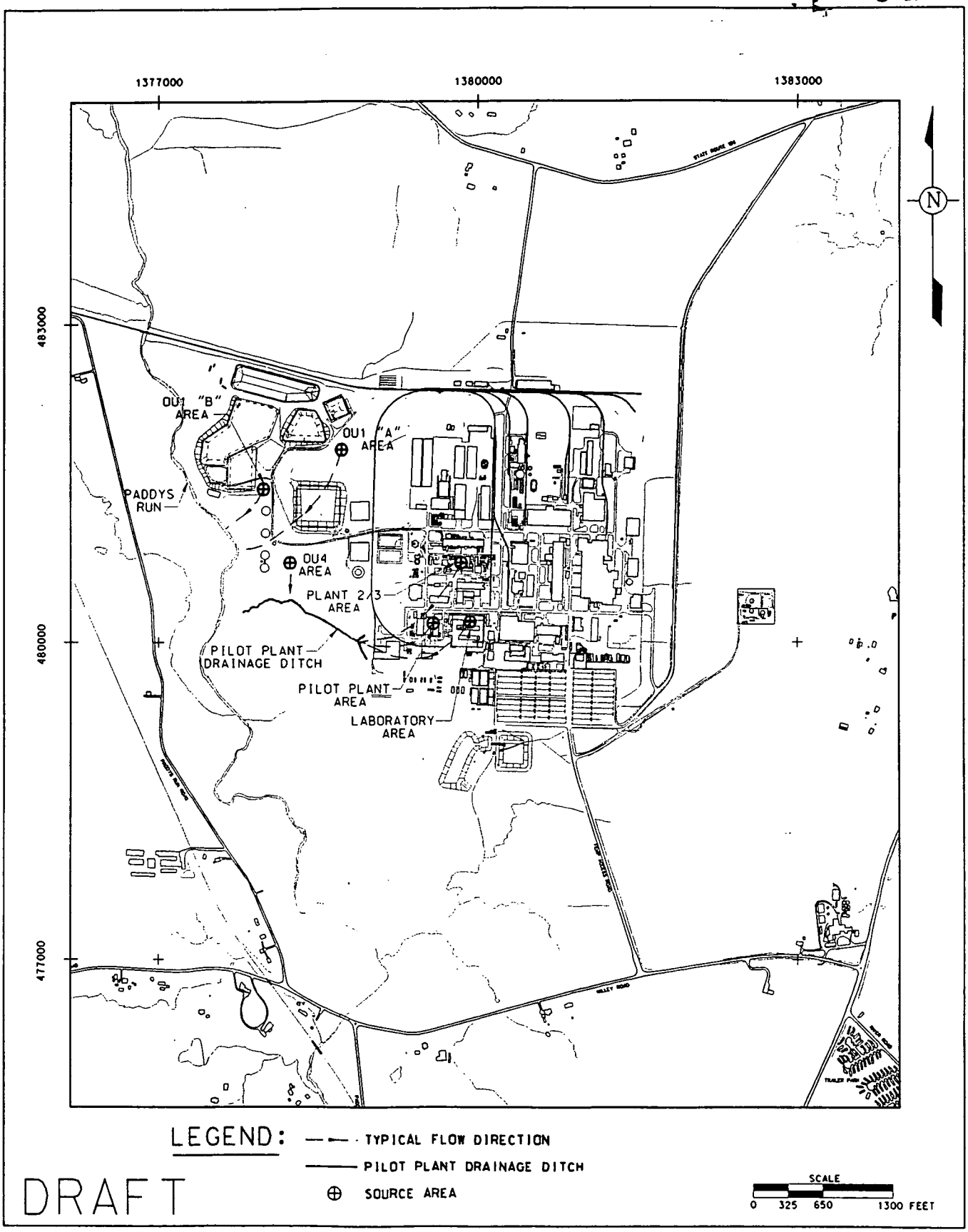

FIGURE F.3.6-4 PERCHED WATER AS A LATERAL SOURCE TO SURFACE WATER

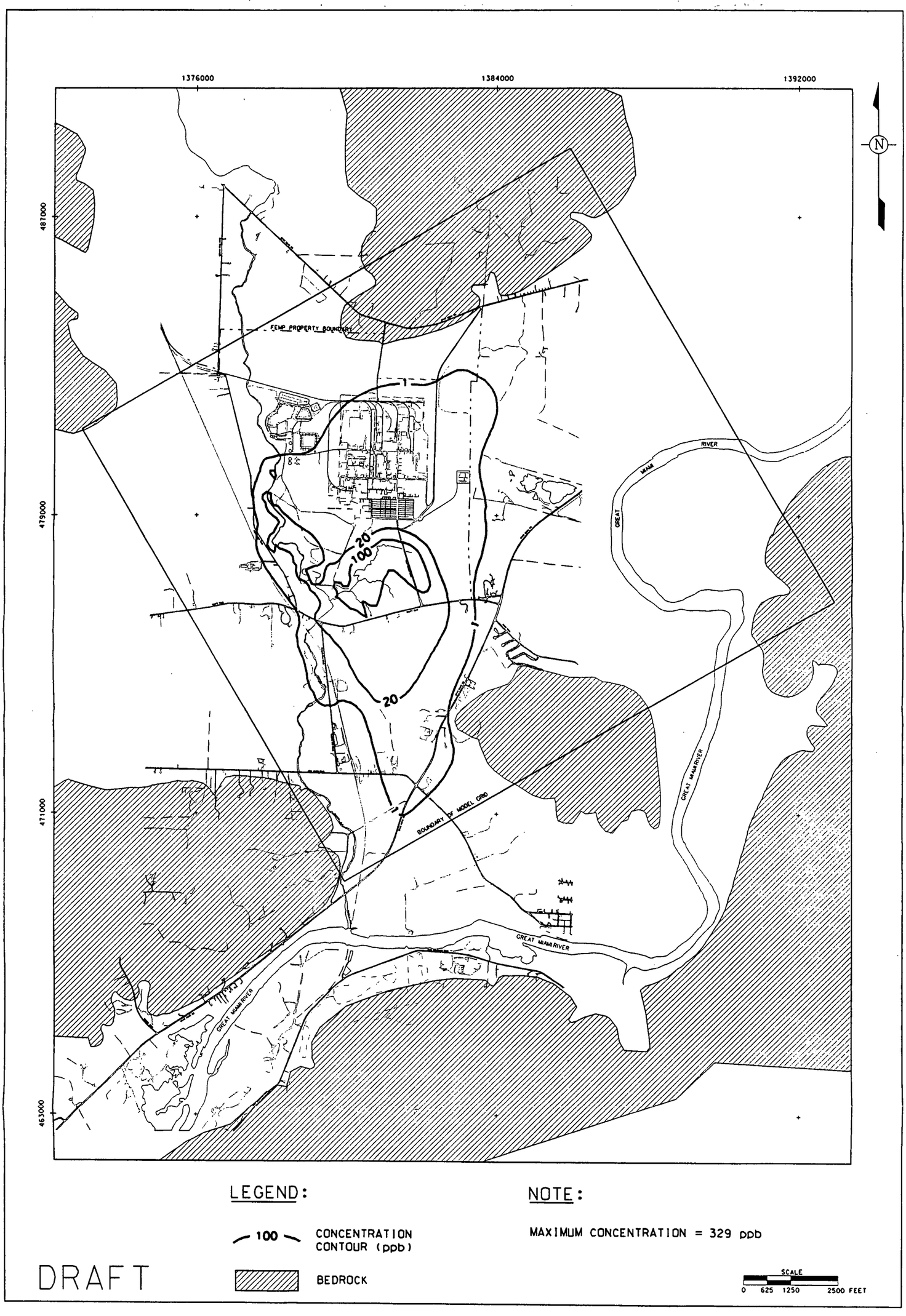

FIGURE F.3.7-1. CONCENTRATIONS OF TOTAL URANIUM IN THE GREAT MIAMI AQUIFER AT 70 YEARS

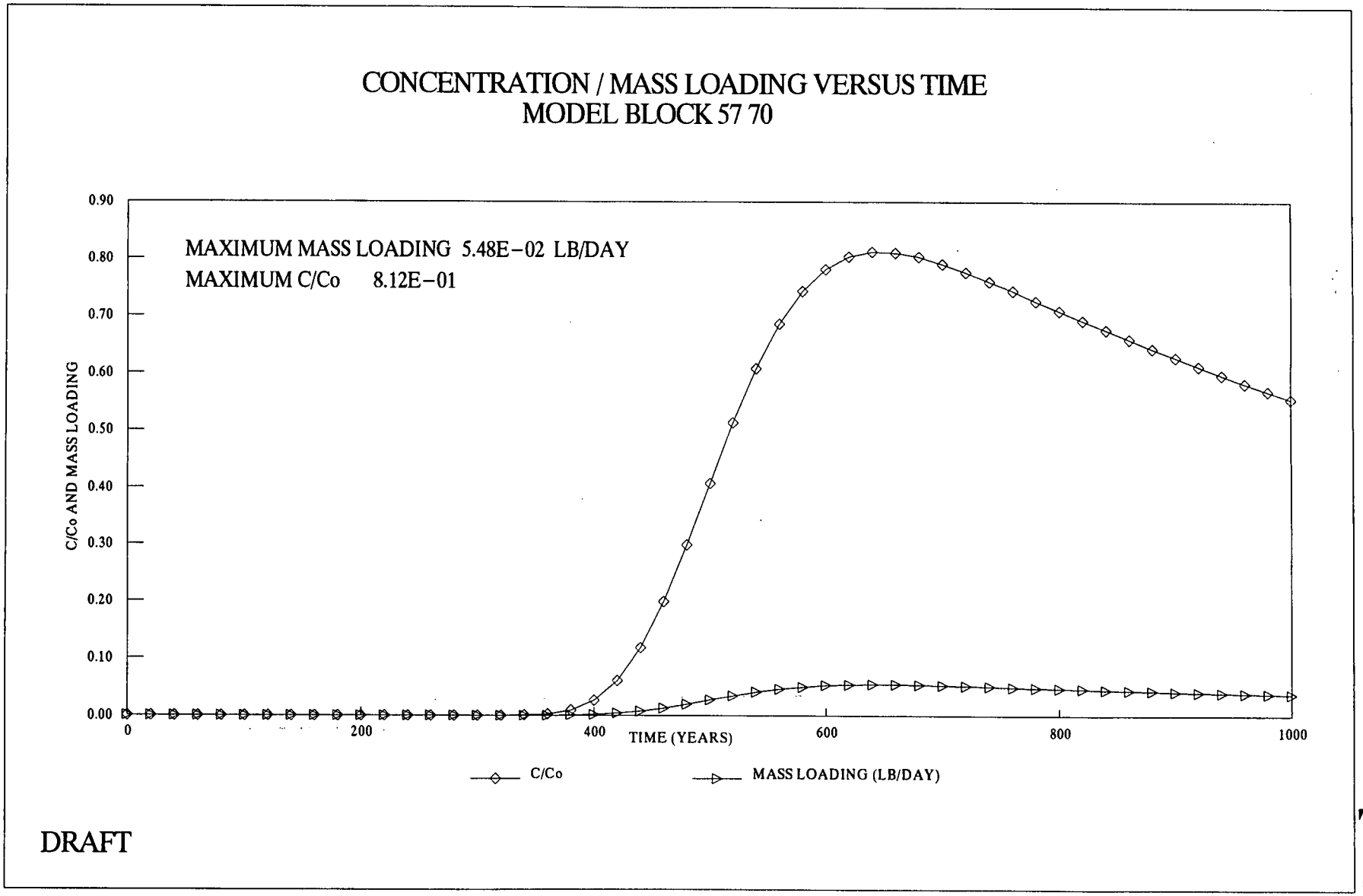

FIGURE F.3.7-2 LOADING AND BREAKTHROUGH CONCENTRATION FOR TOTAL URANIUM IN THE MAXIMUM LOADING MODEL BLOCK

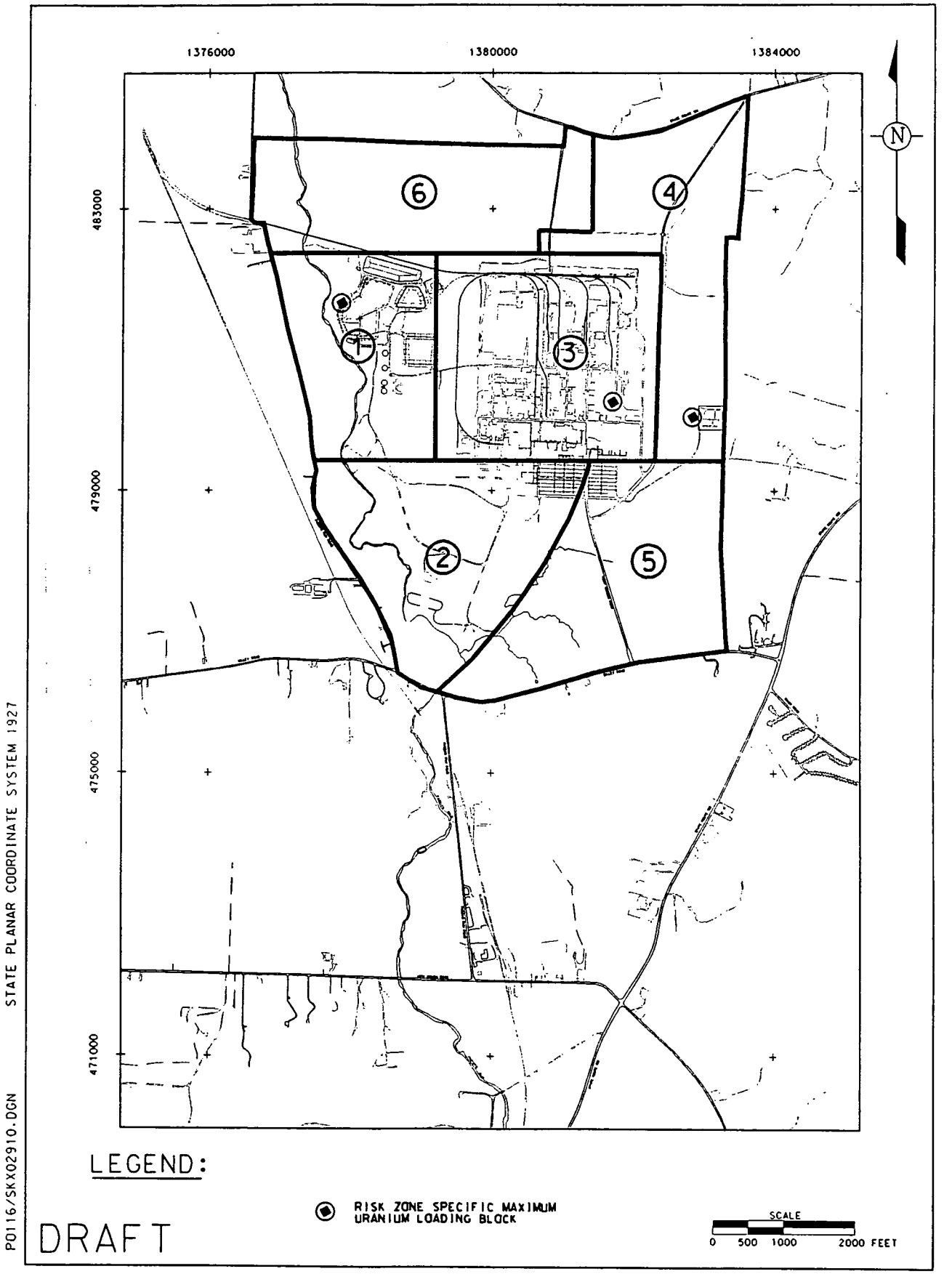

FIGURE F.3.7-3 LOCATION OF RISK ZONE SPECIFIC MAXIMUM URANIUM LOADINGS ABOVE SCREENING LEVEL

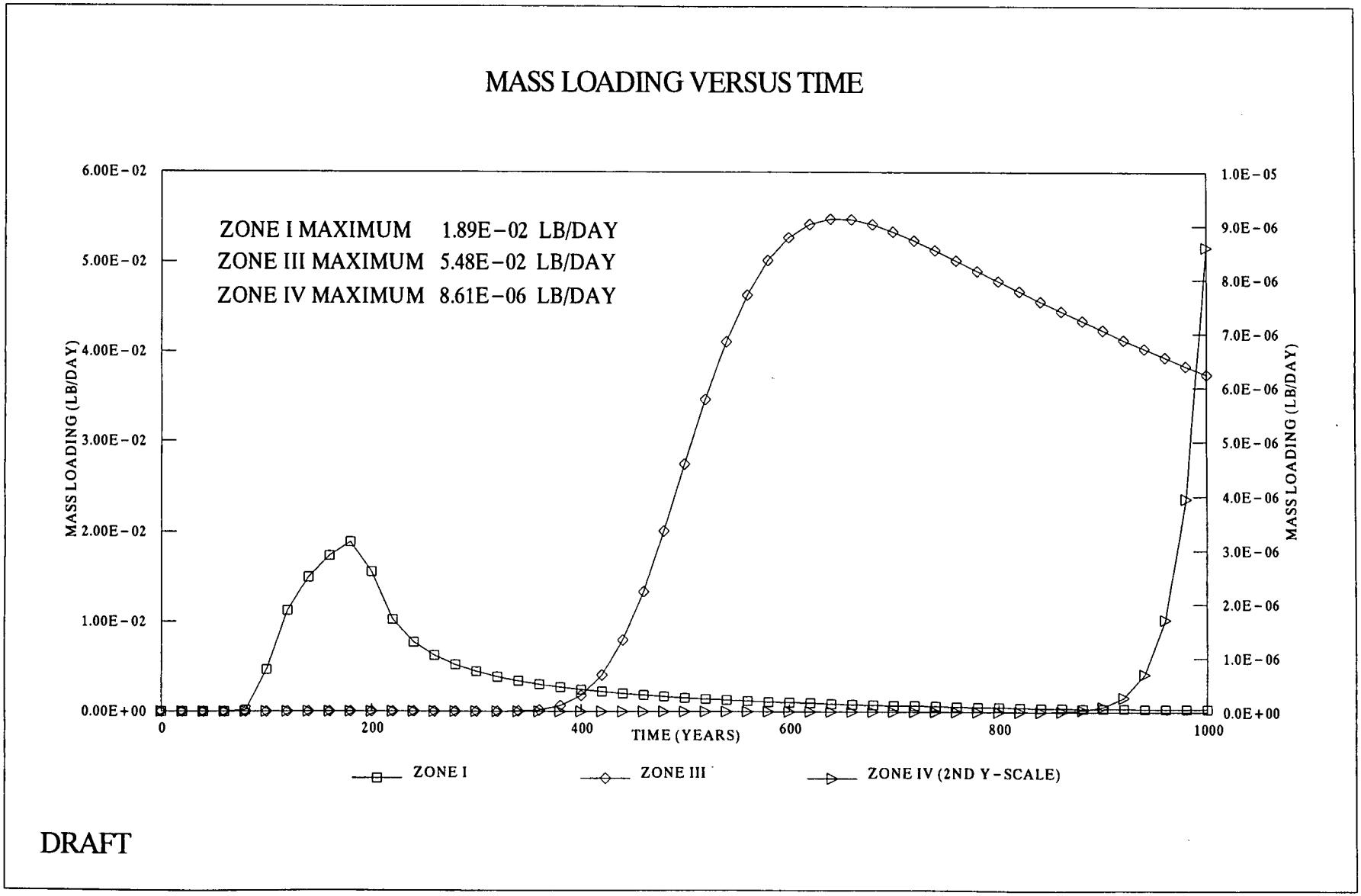

FIGURE F.3.7-4 AREA SPECIFIC MAXIMUM TOTAL URANIUM LOADING CURVE

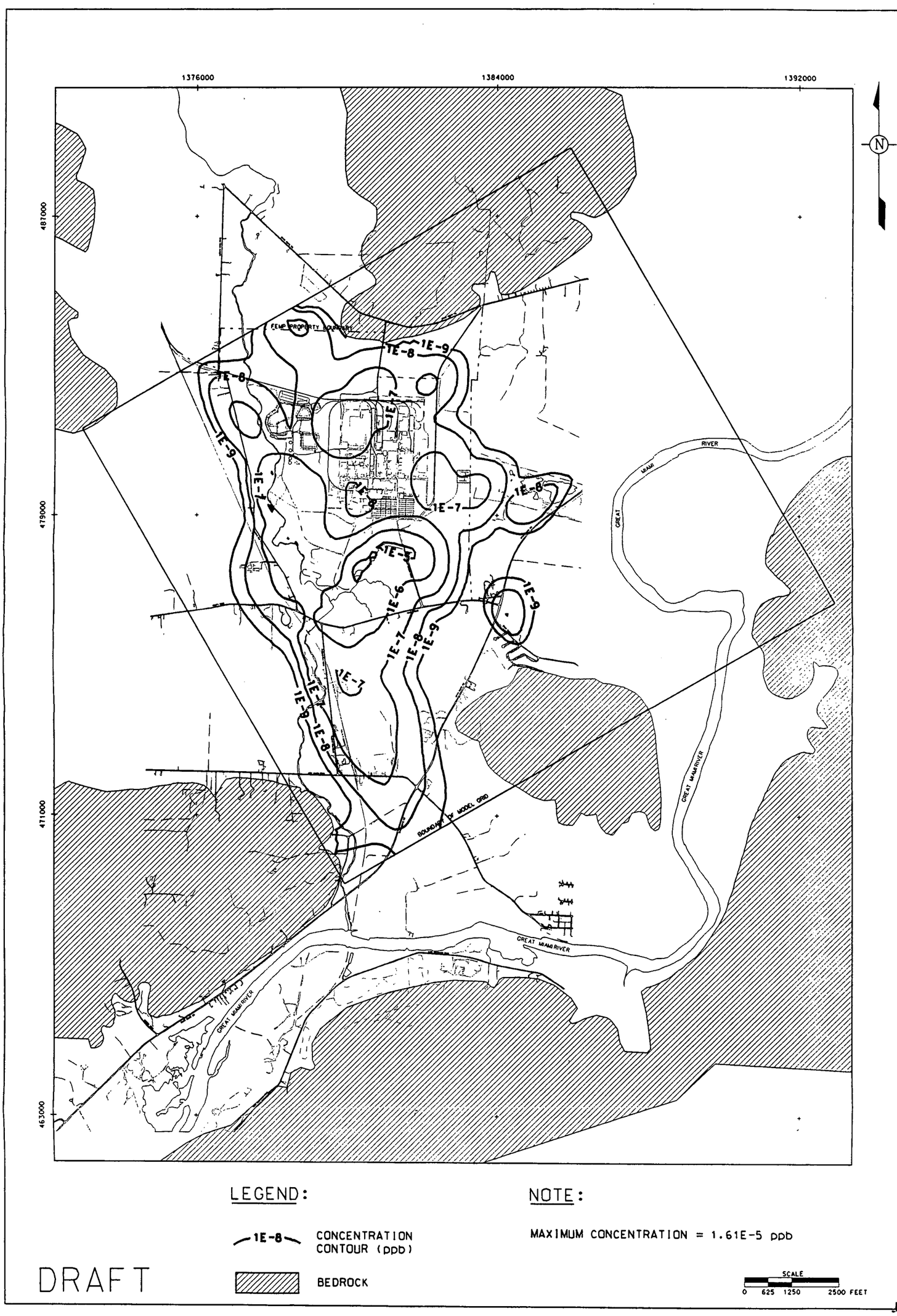

FIGURE F.3.7-5. CONCENTRATIONS OF RADIUM-226 IN THE GREAT MIAMI AQUIFER AT 1000 YEARS (FEMP AND FENCELINE MAXIMUM)

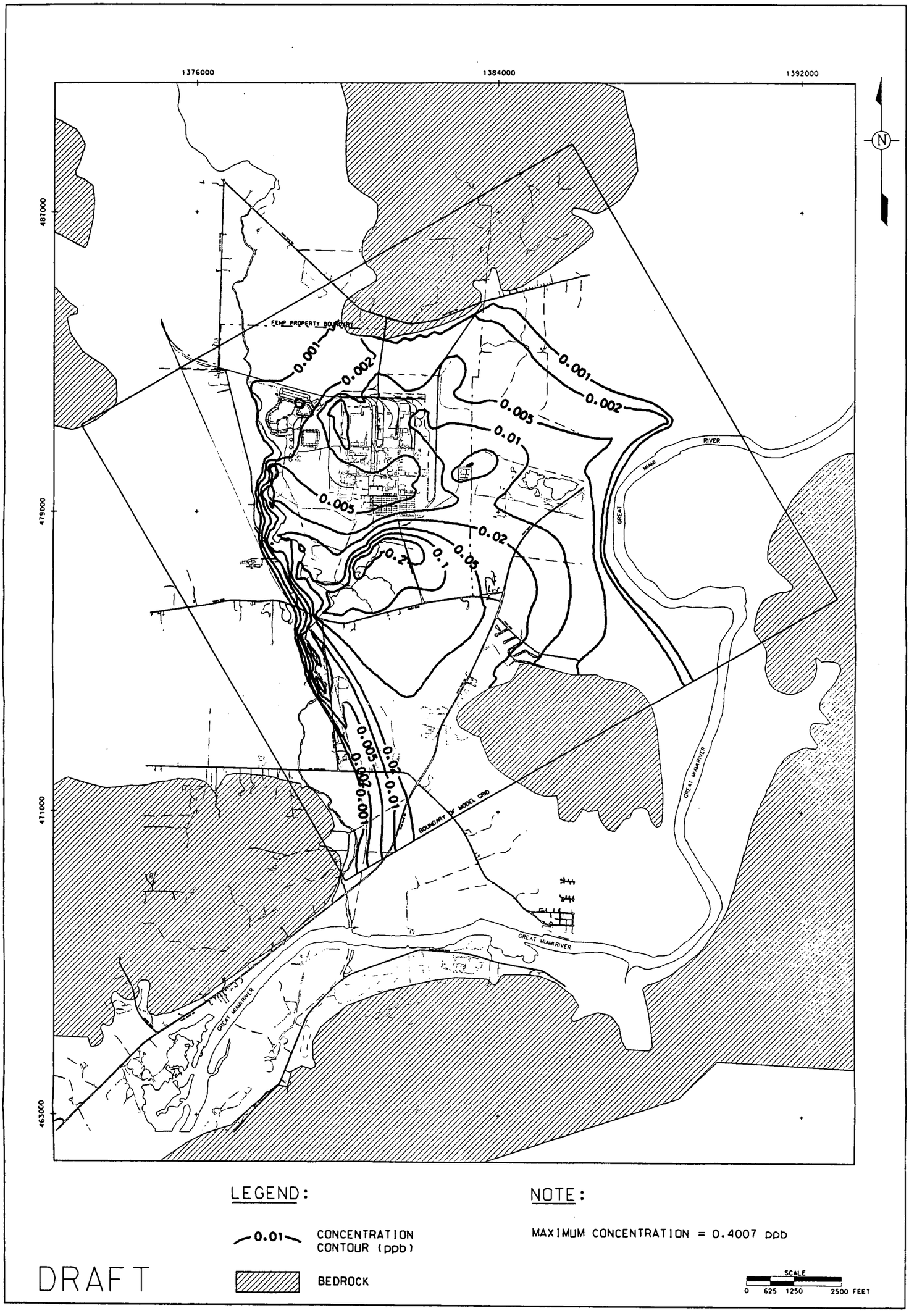

FIGURE F.3.7-6. CONCENTRATIONS OF TECHNETIUM-99 IN THE GREAT MIAMI AQUIFER AT 100 YEARS (FENCELINE MAXIMUM)

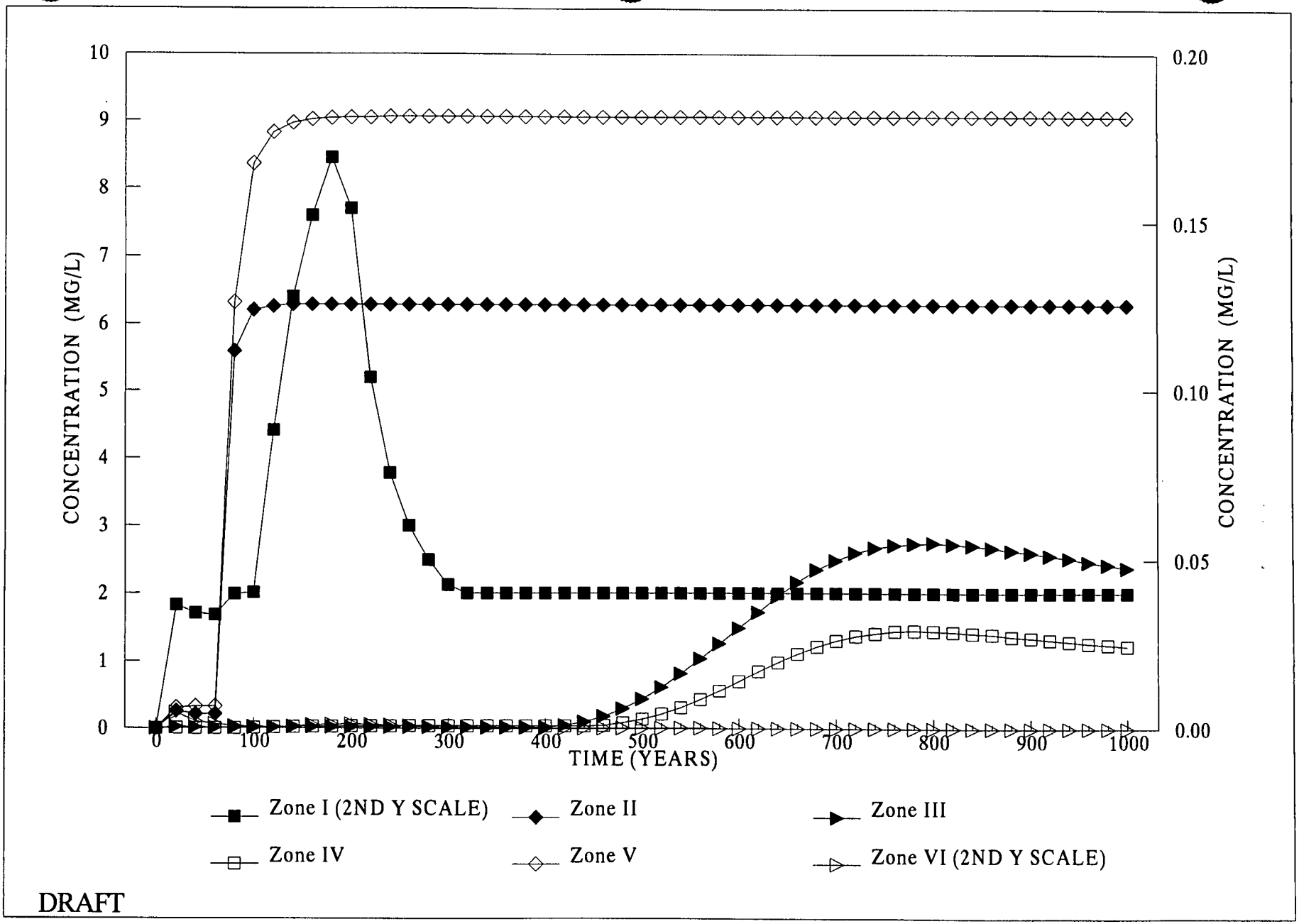

FIGURE F.3.7-7. ON-PROPERTY AREA-SPECIFIC MAXIMUM URANIUM CONCENTRATIONS VERSUS TIME

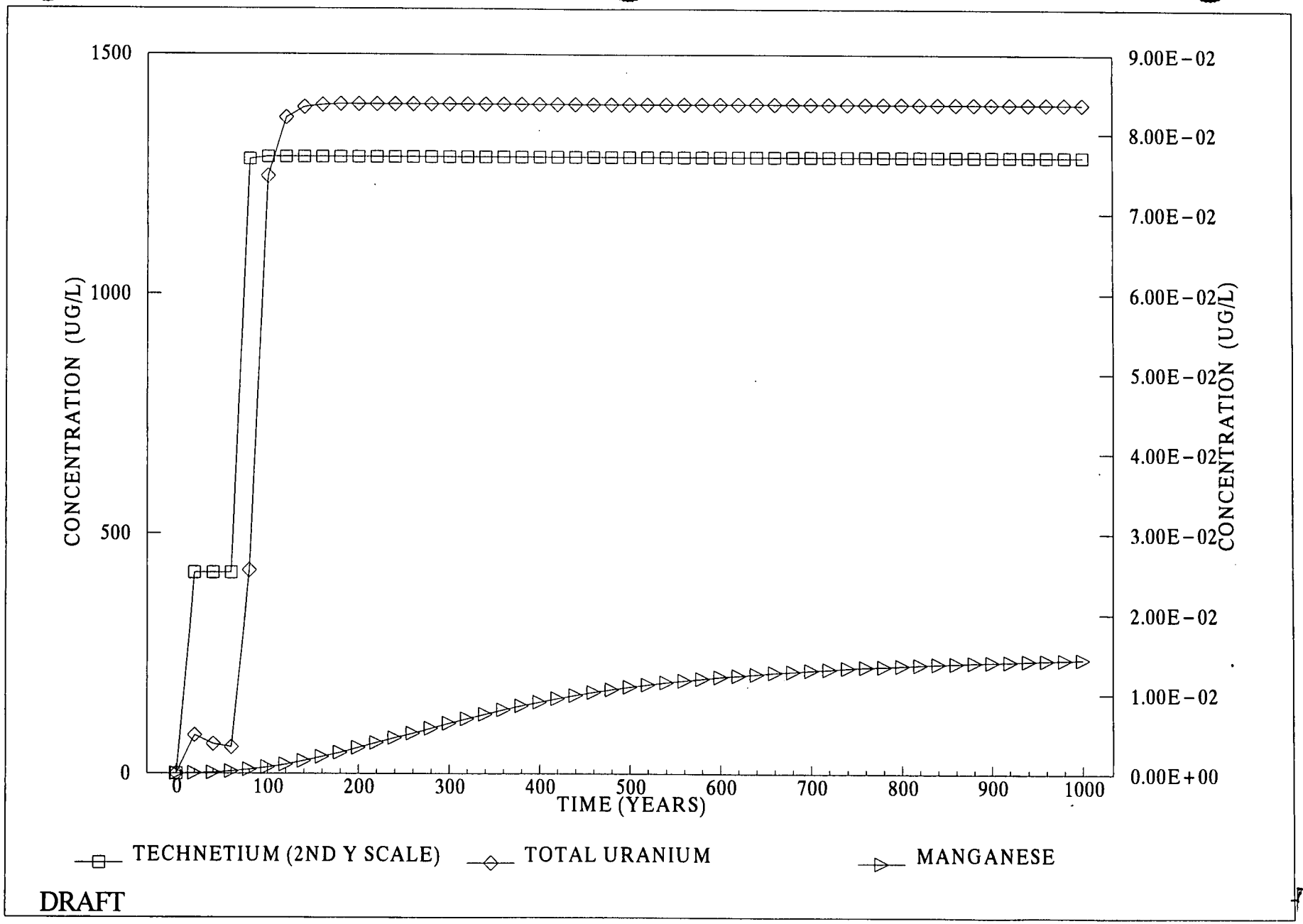

FIGURE F.3.7-8. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR WELL 12

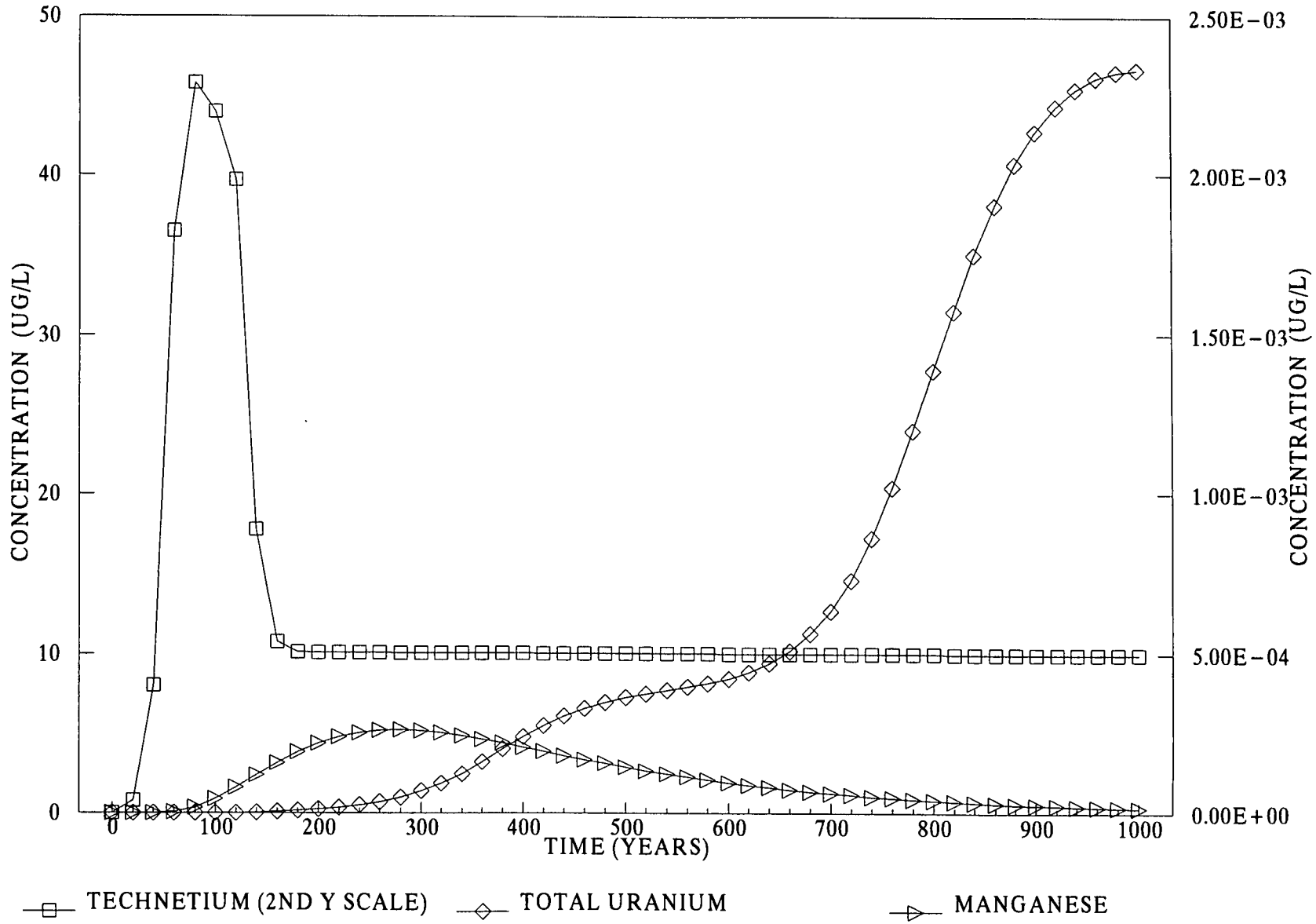

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FIGURE F.3.7-9. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR WELL 13

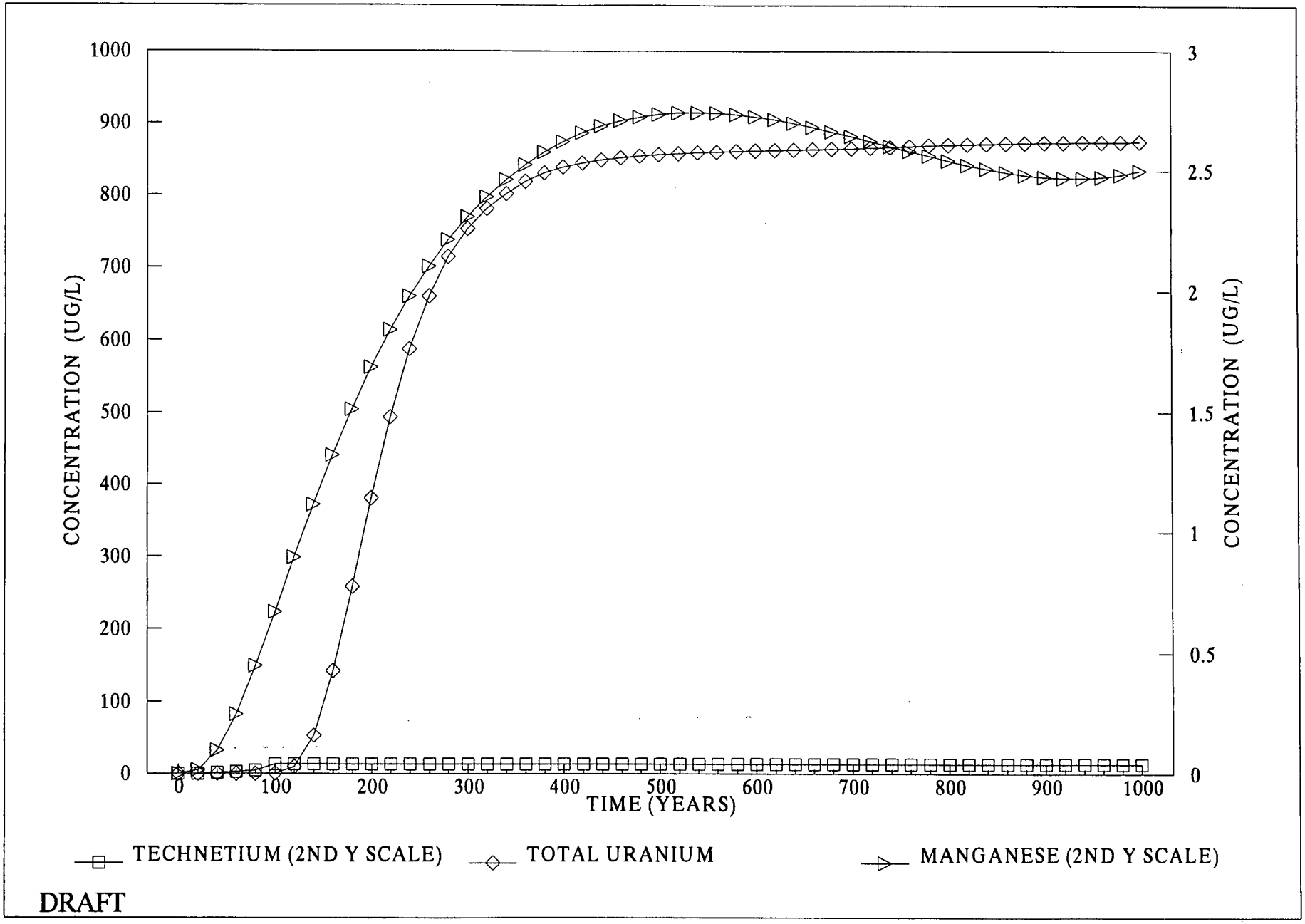

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FIGURE F.3.7-10. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR WELL 14

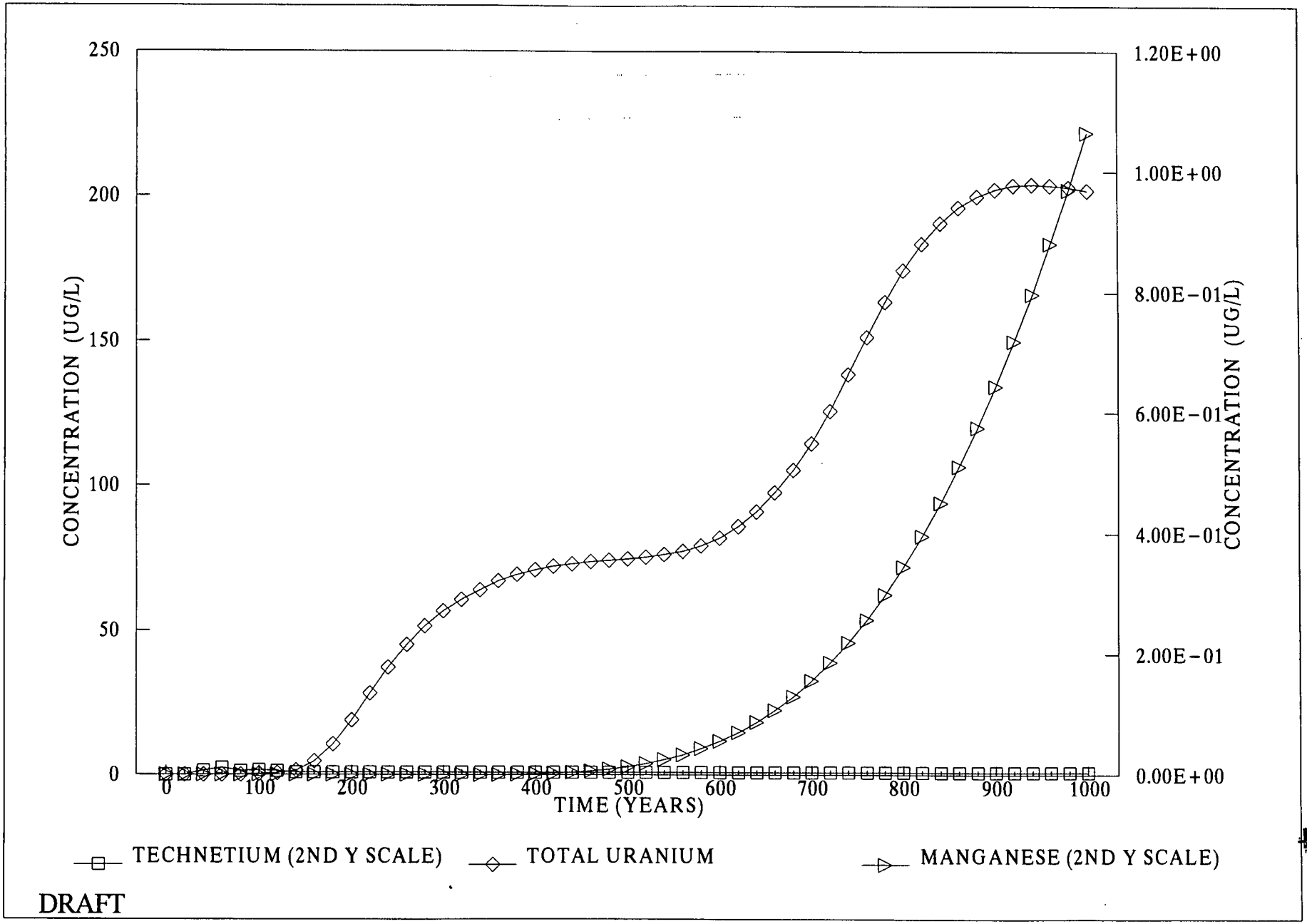


FIGURE F.3.7-11. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR WELL 2119

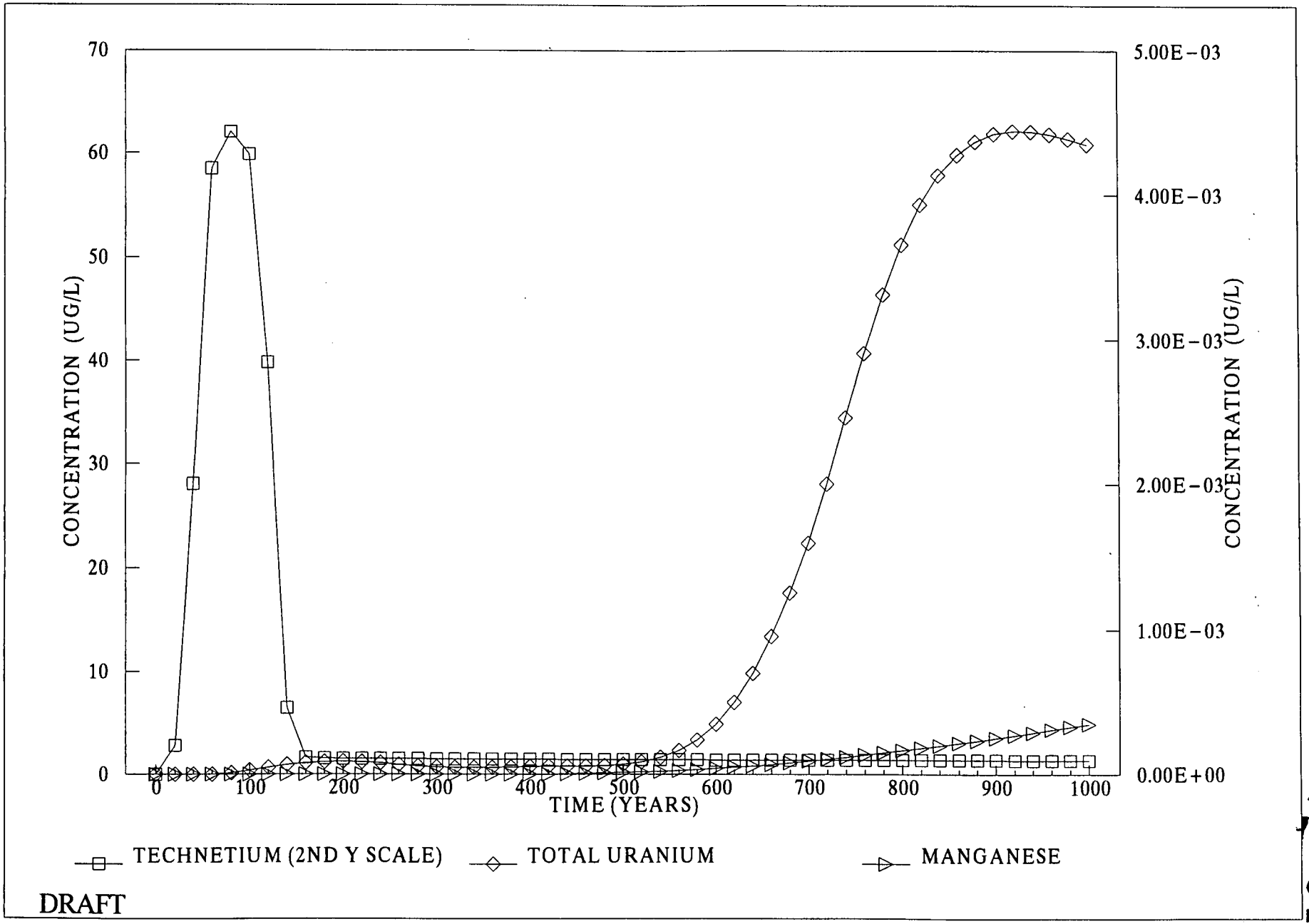


FIGURE F.3.7-12. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR WELL 2071

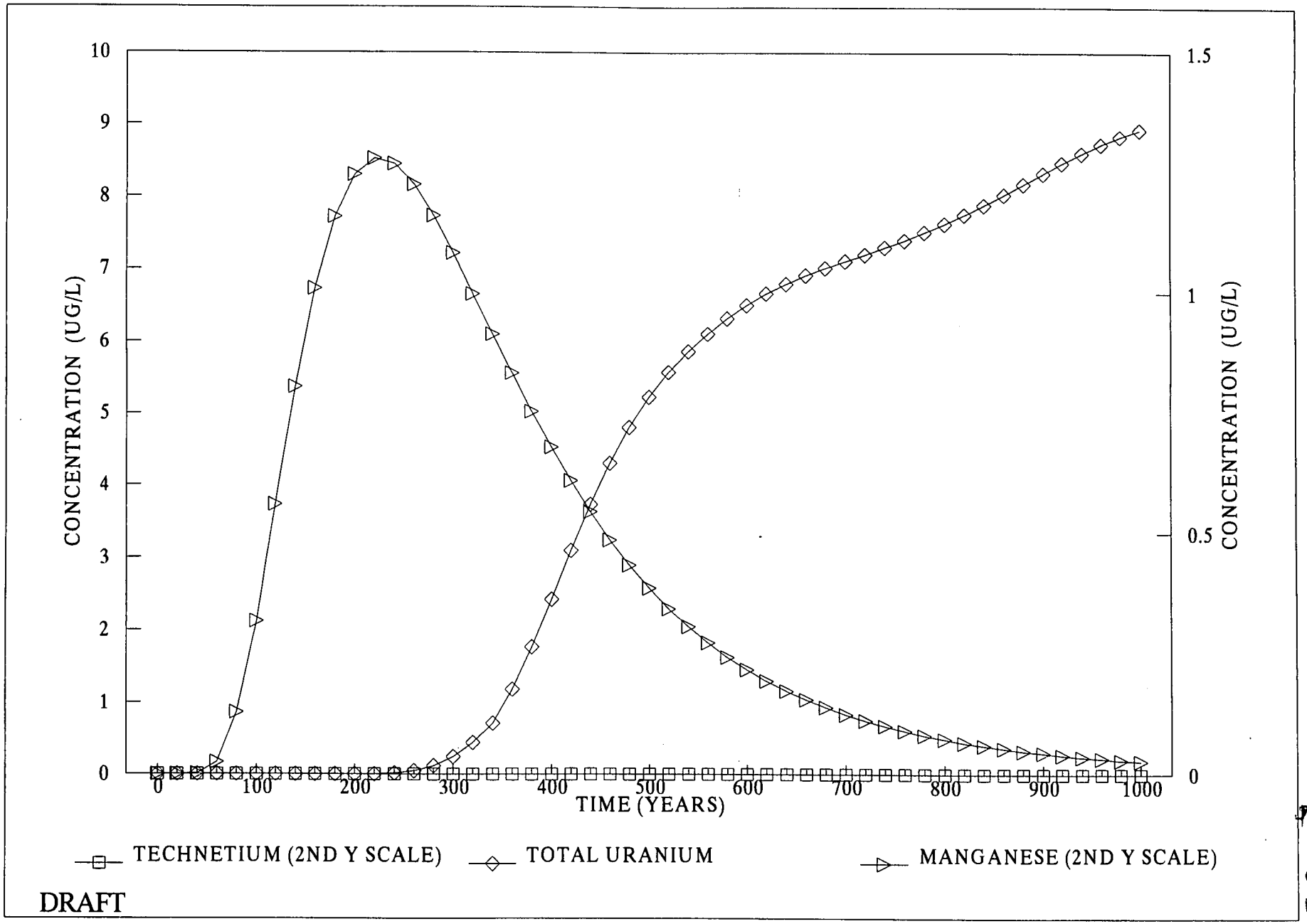


FIGURE F.3.7–13. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR COLL 1

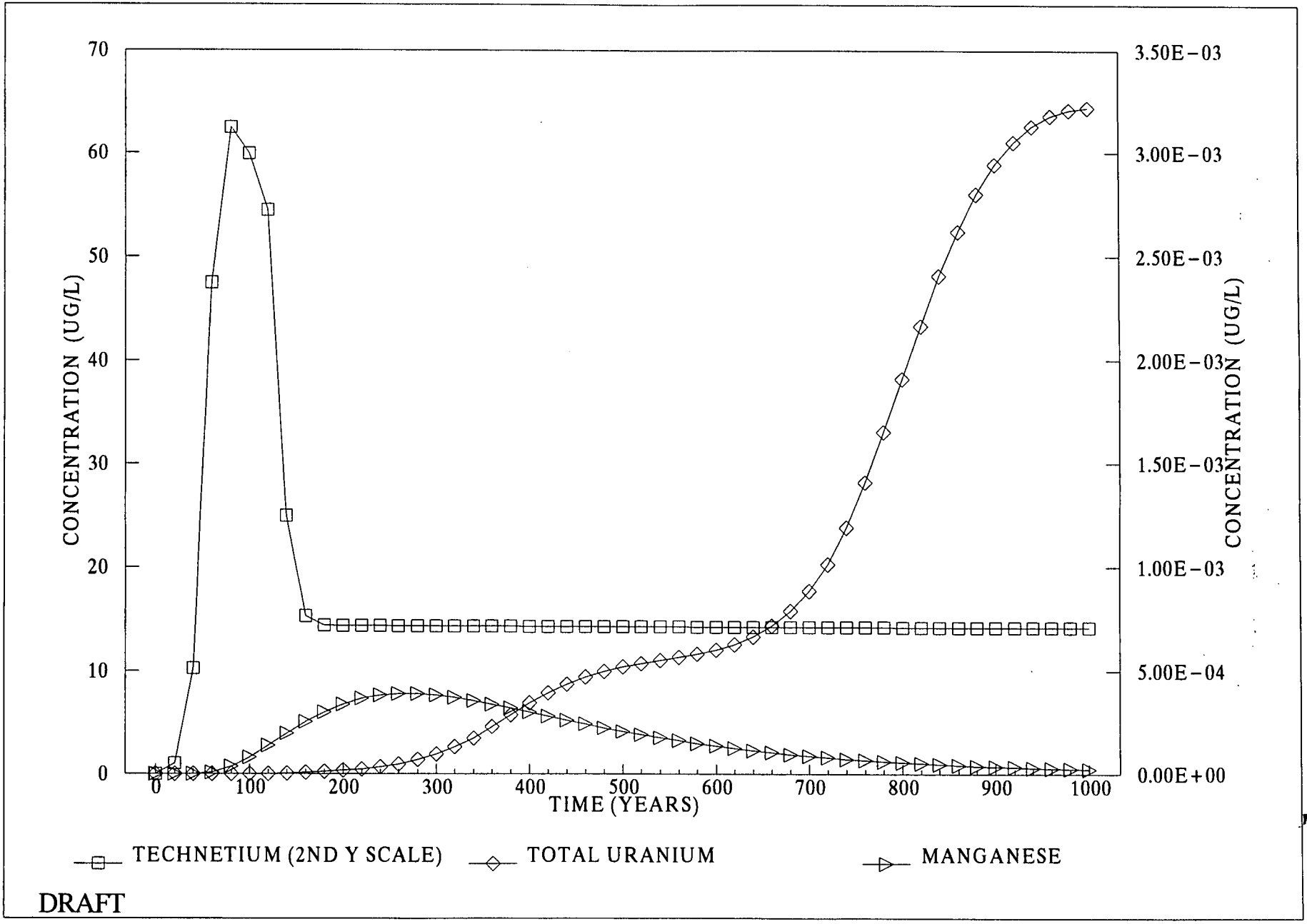


FIGURE F.3.7-14. CONCENTRATION OF KEY CONSTITUENTS VERSUS TIME AT RECEPTOR COLL 2

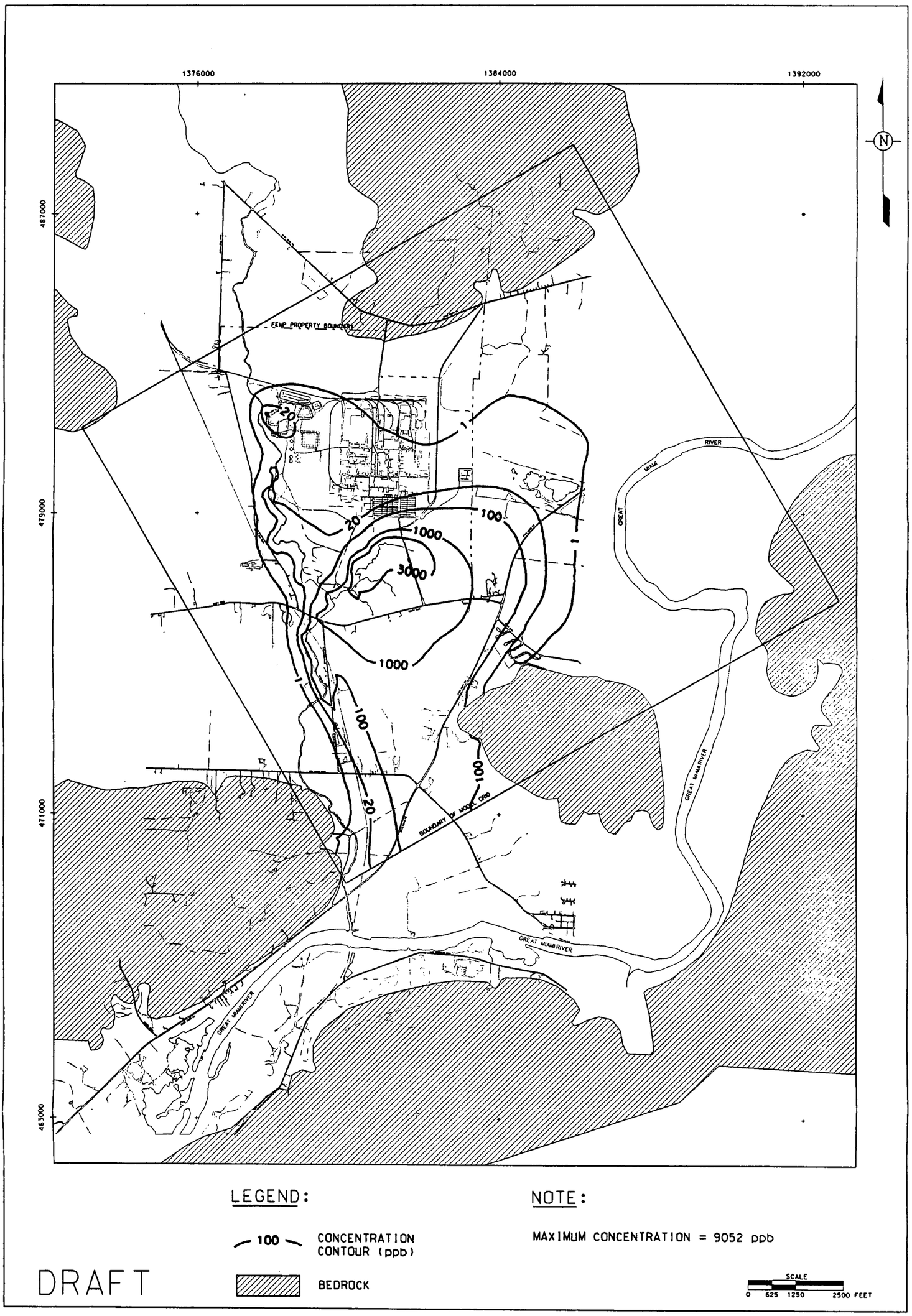


FIGURE F.3.7-15. CONCENTRATIONS OF TOTAL URANIUM IN THE GREAT MIAMI AQUIFER AT 210 YEARS (FENCELINE MAXIMUM)

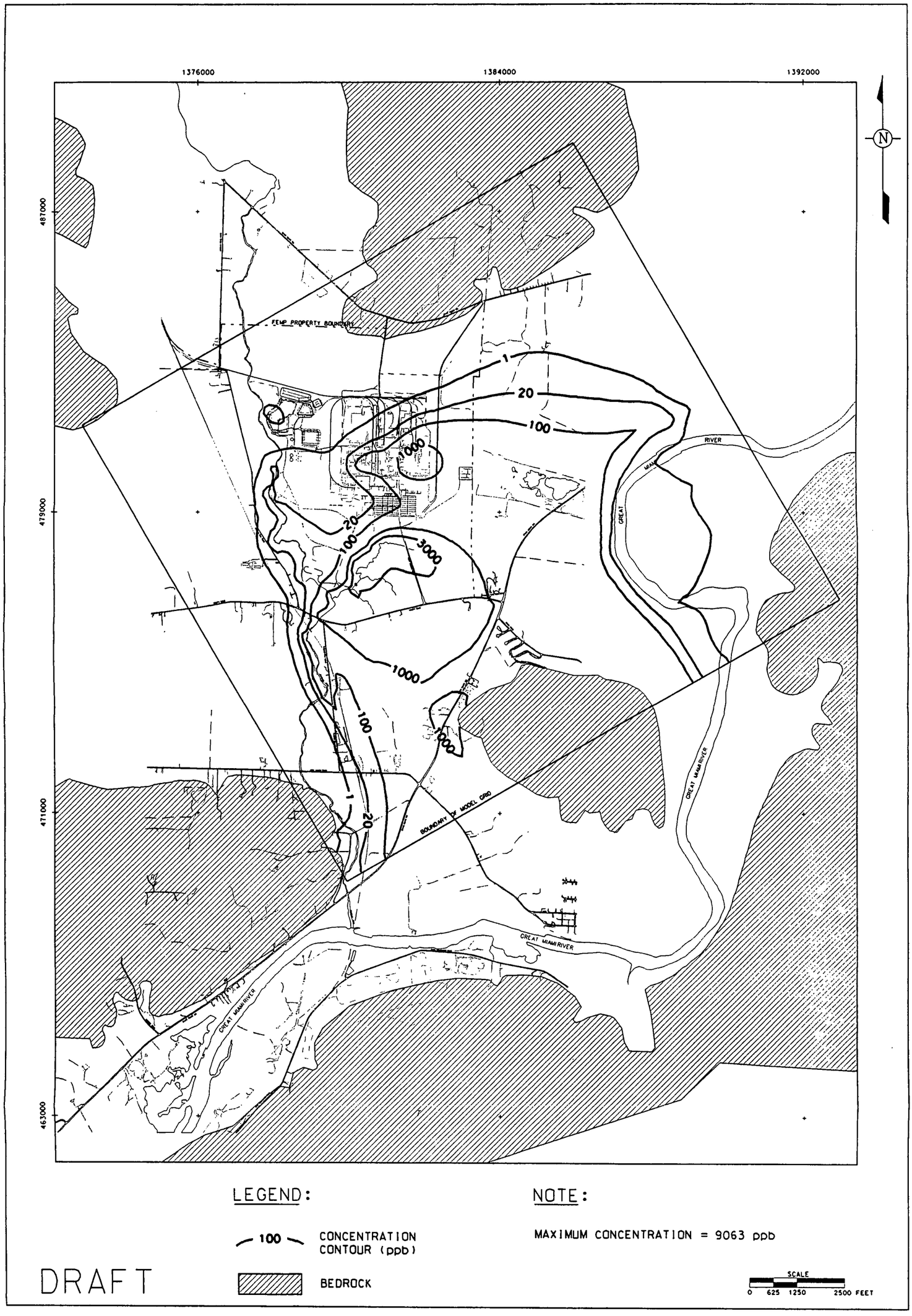
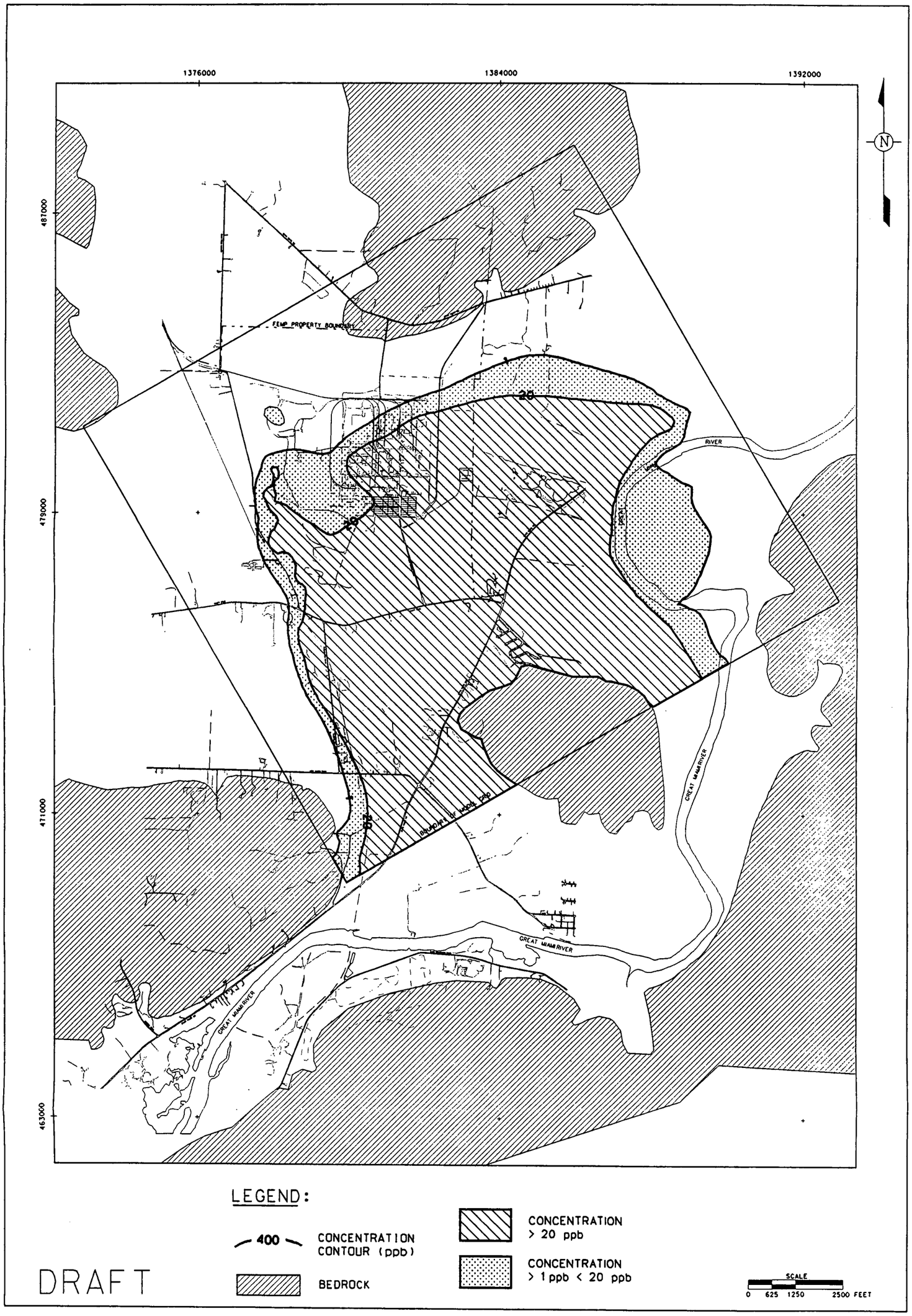


FIGURE F.3.7-16. CONCENTRATIONS OF TOTAL URANIUM IN THE GREAT MIAMI AQUIFER AT 1000 YEARS



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P0116/SKX02978.DGN

FIGURE F.3.7-17. MAXIMUM AREAL EXTENT OF TOTAL URANIUM CONTAMINATION

001127

1919.6161

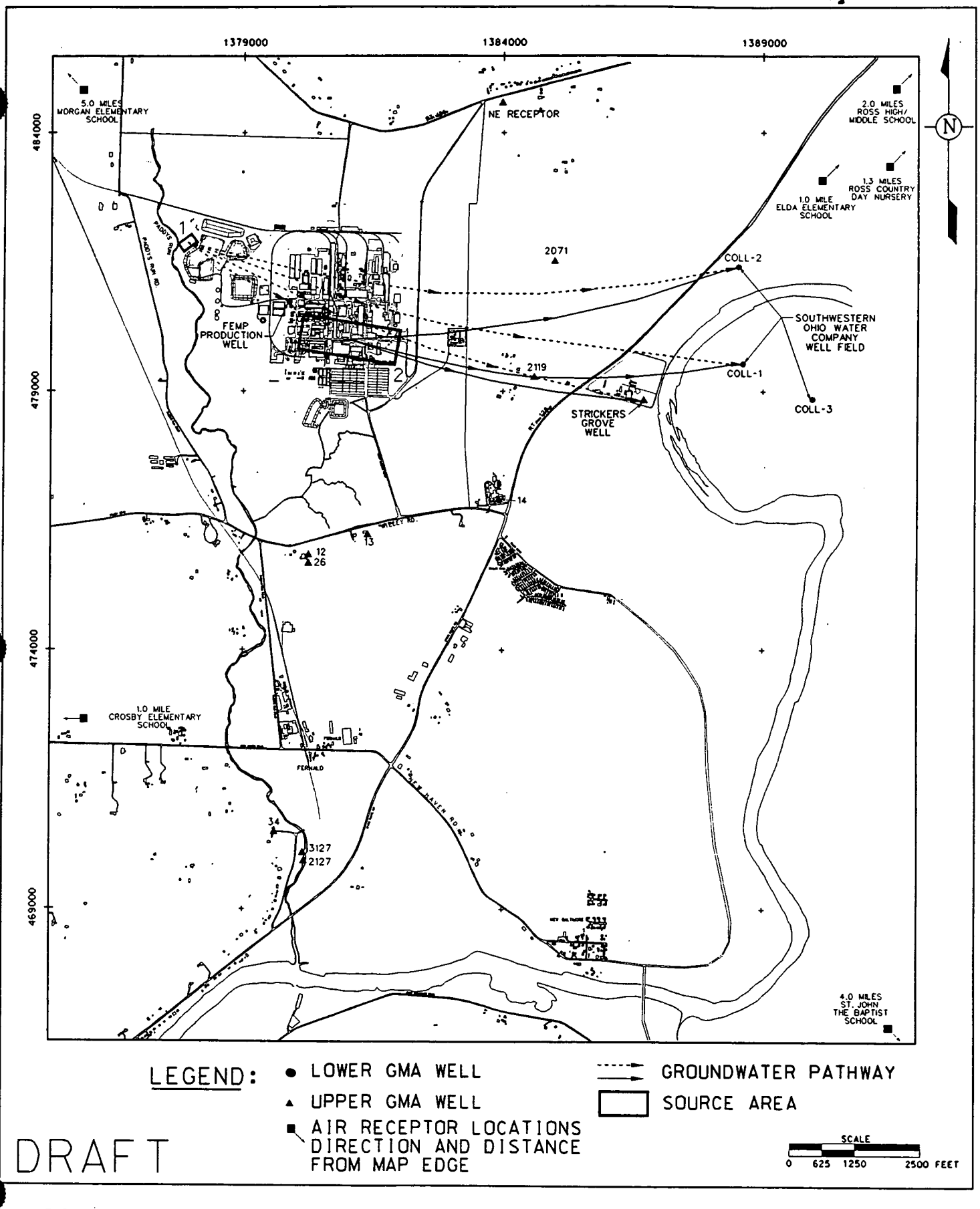

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FIGURE F.3.7-18. SURFACE SOIL LOADING AREAS AND FLOW PATHS (CARBAZOLE)

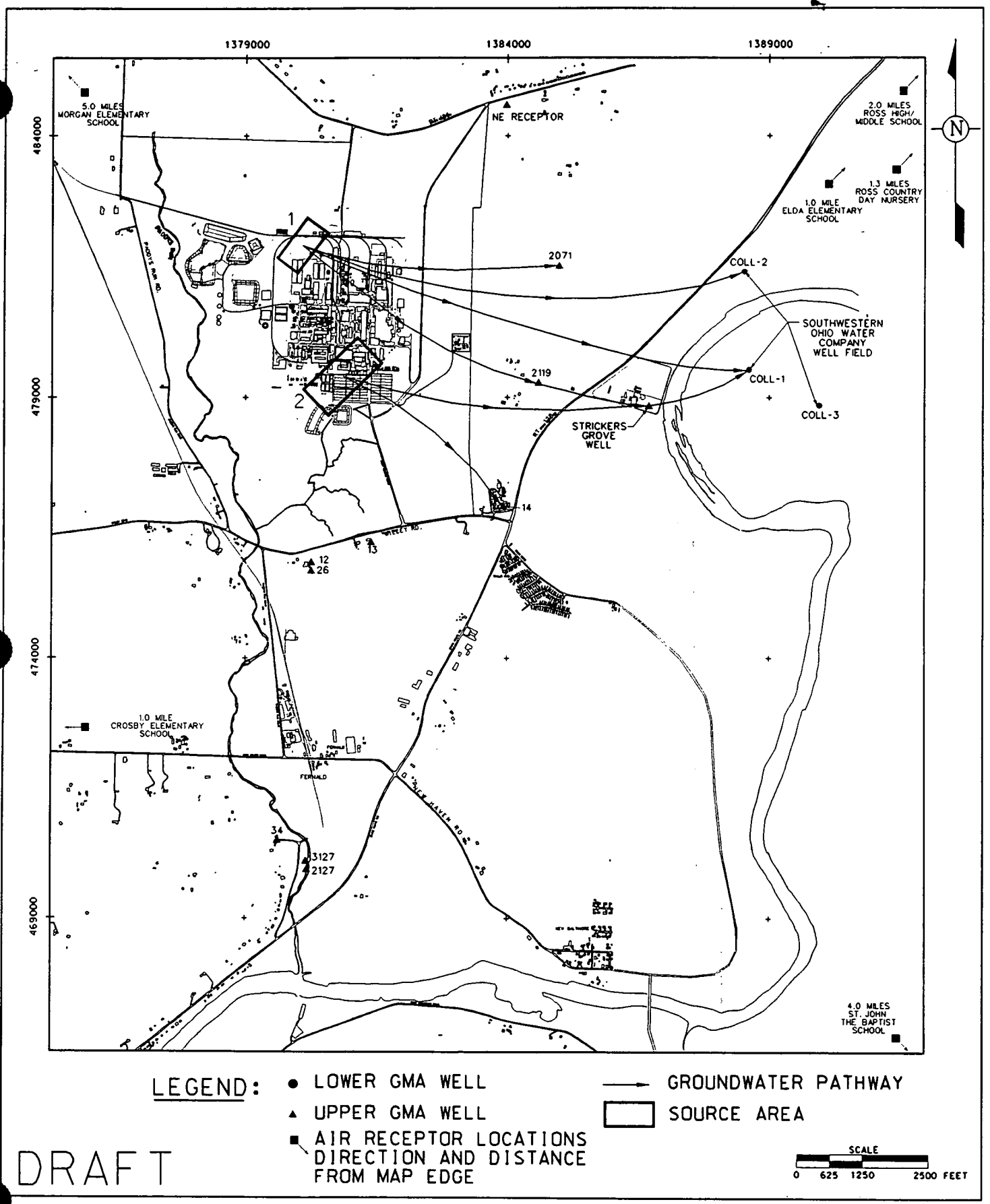

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FIGURE F.3.7-19. SURFACE SOIL LOADING AREAS AND FLOW PATHS (ALPHA-CHLORDANE)

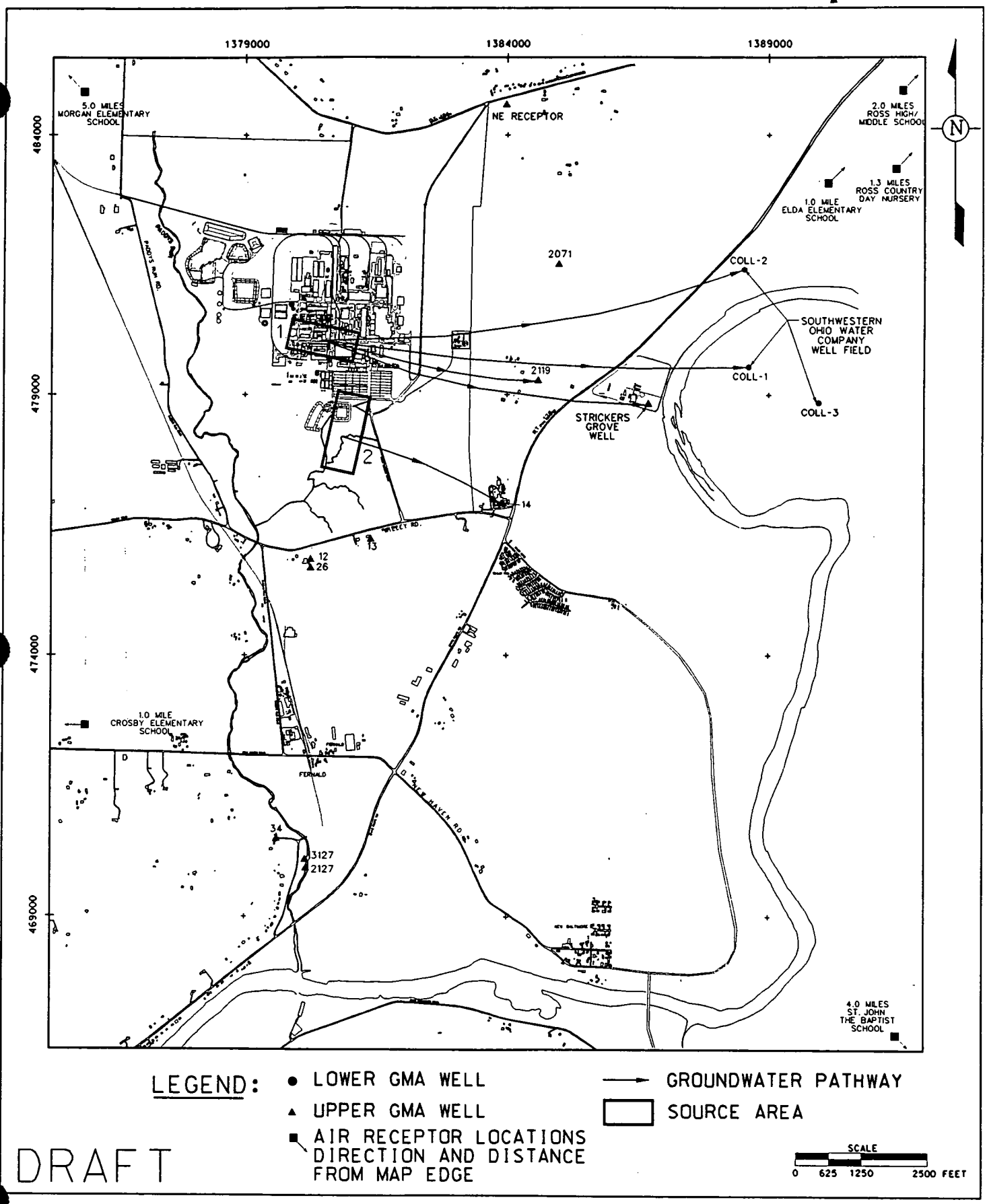

FIGURE F.3.7-20. SURFACE SOIL LOADING AREAS AND FLOW PATHS (MERCURY)

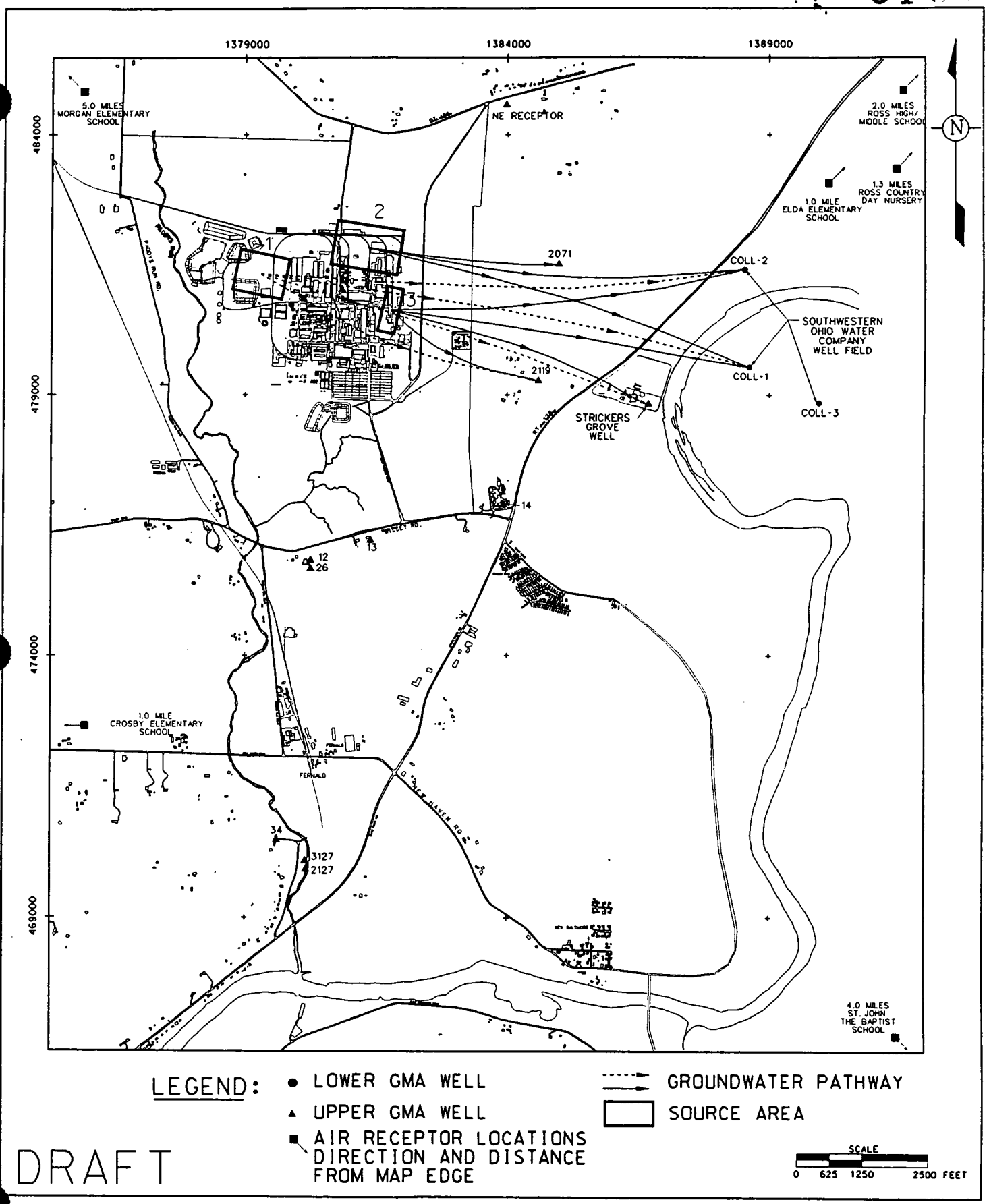

FIGURE F.3.7-21. SURFACE SOIL LOADING AREAS AND FLOW PATHS (BIS (2-CHLOROISOPROPYL) ETHER

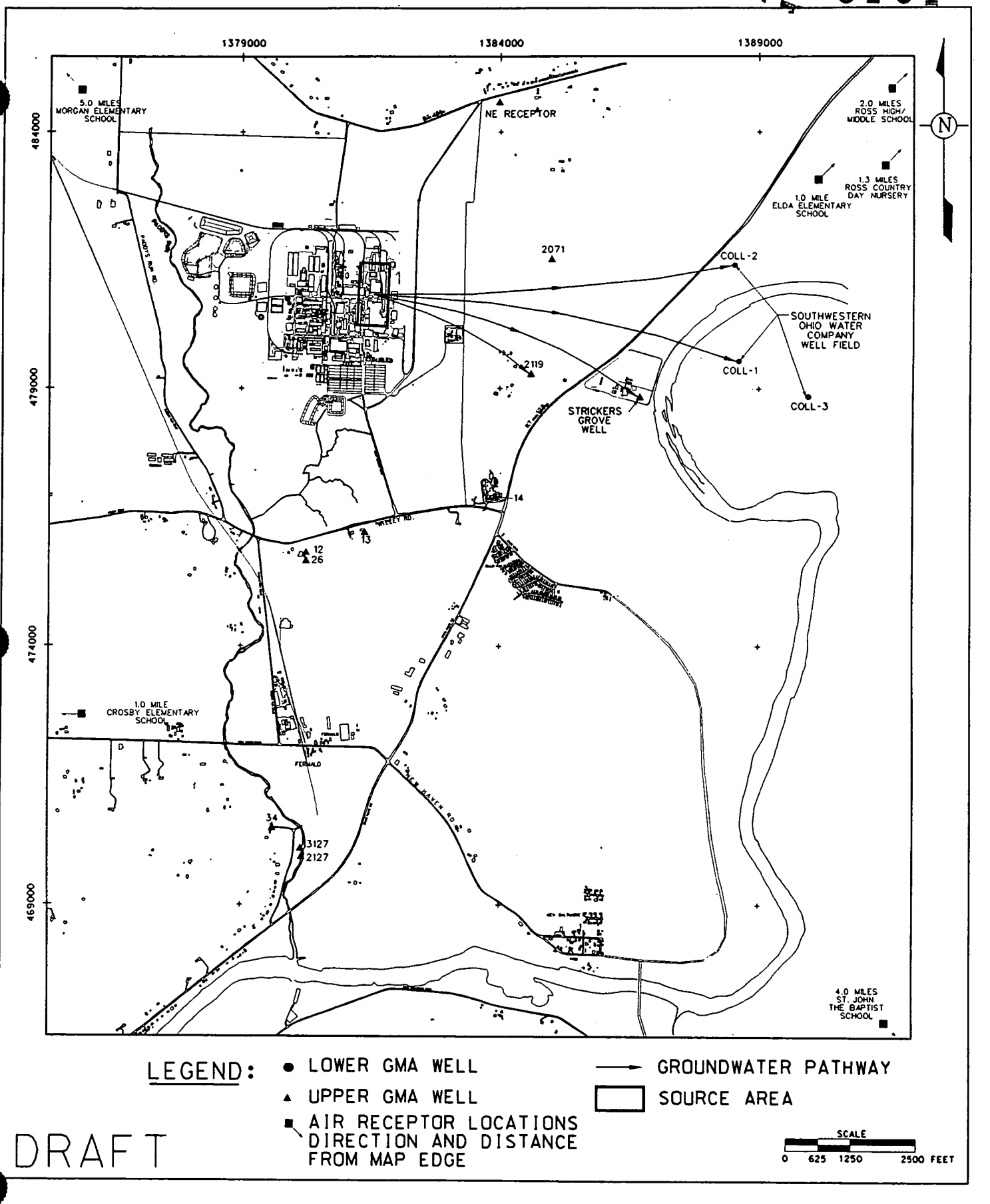

FIGURE F.3.7-22. SURFACE SOIL LOADING AREAS AND FLOW PATHS (BROMODICHLOROMETHANE)

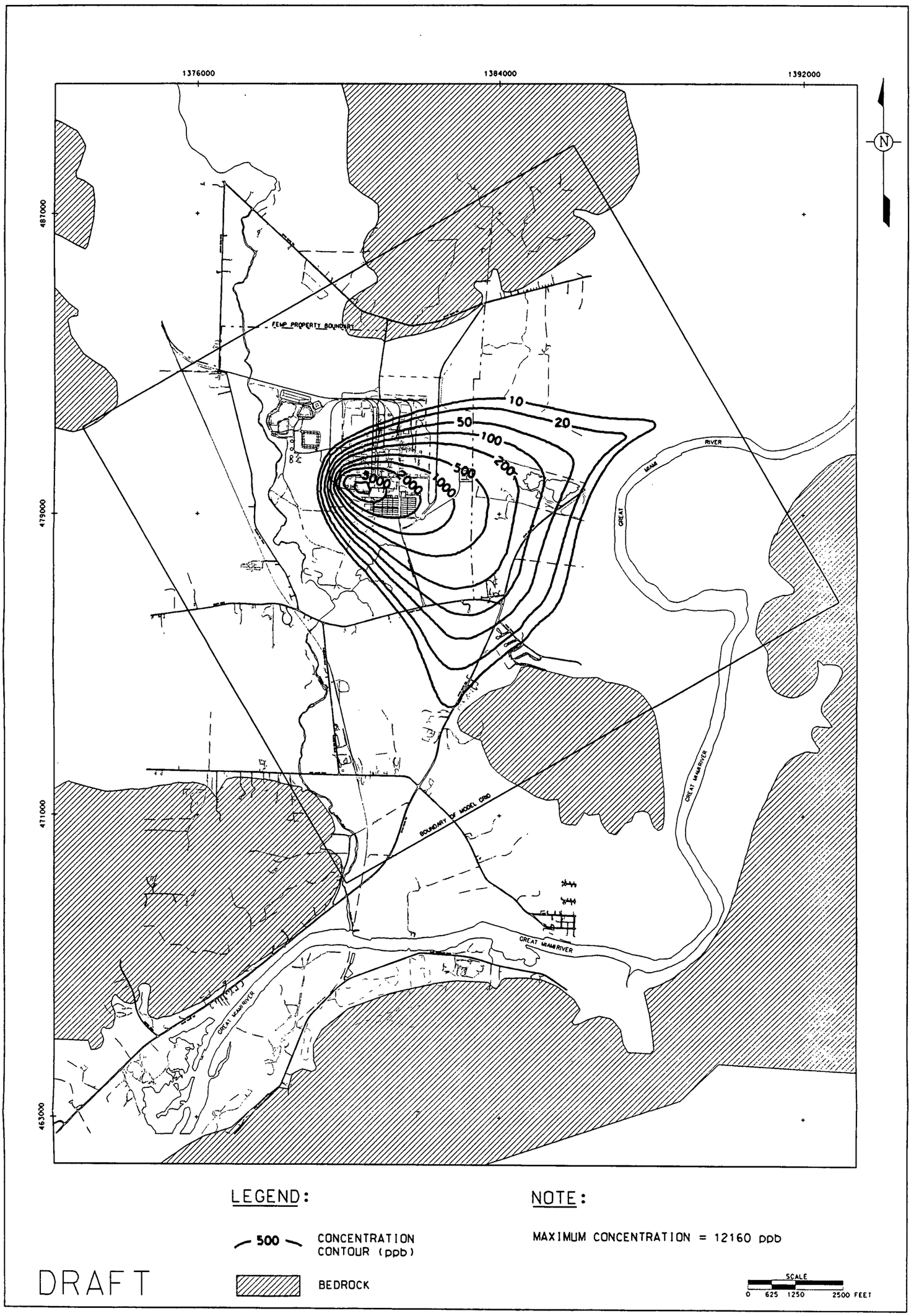

FIGURE F.3.8-1. TOTAL URANIUM K_l/K_d UNCERTAINTY ANALYSIS, CASE 1, PLUME WITH THE MAXIMUM ON-SITE CONCENTRATION AT 800 YEARS

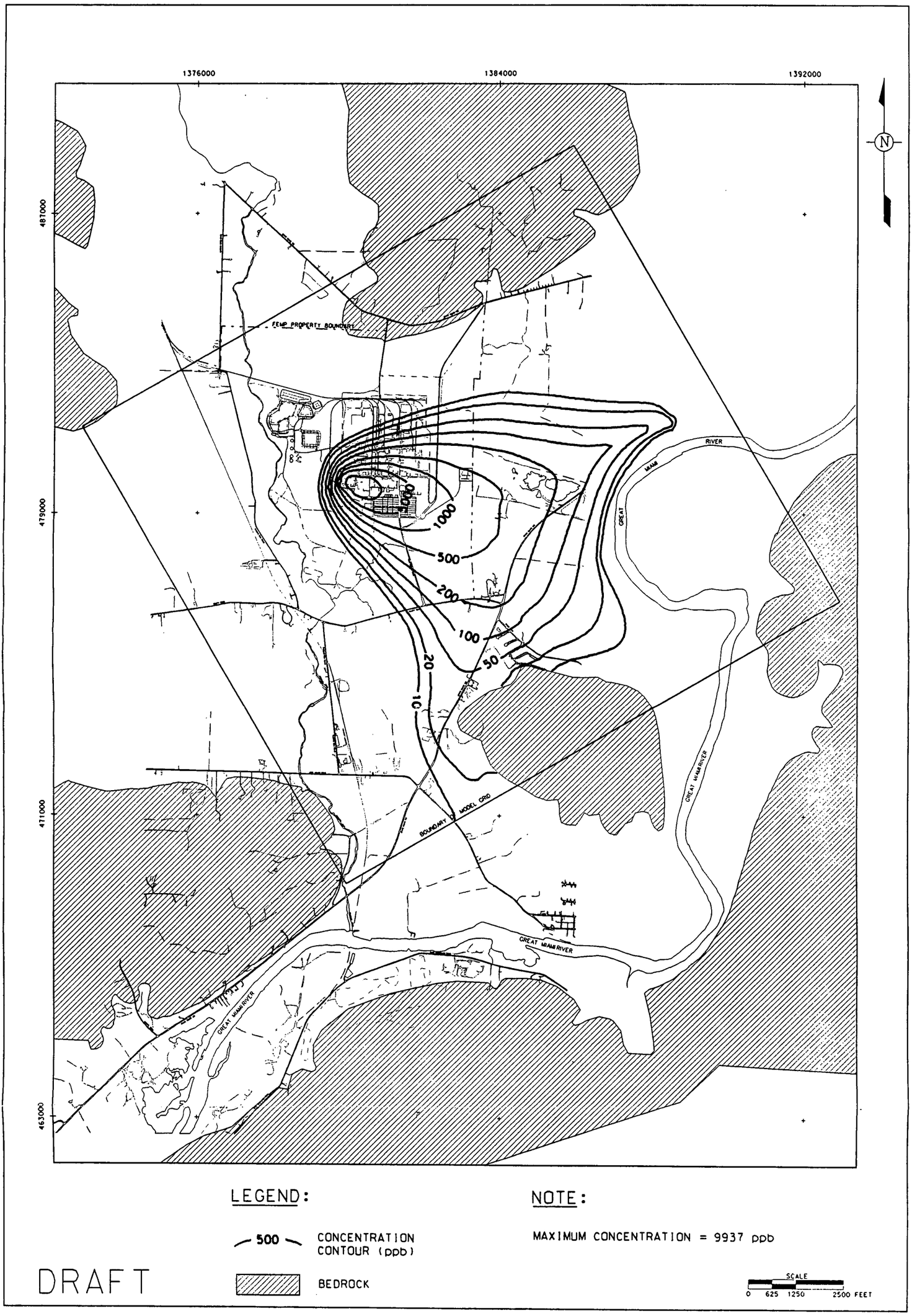

FIGURE F.3.8-2. TOTAL URANIUM K_1/K_d UNCERTAINTY ANALYSIS, CASE 2, PLUME WITH THE MAXIMUM ON-SITE CONCENTRATION AT 980 YEARS

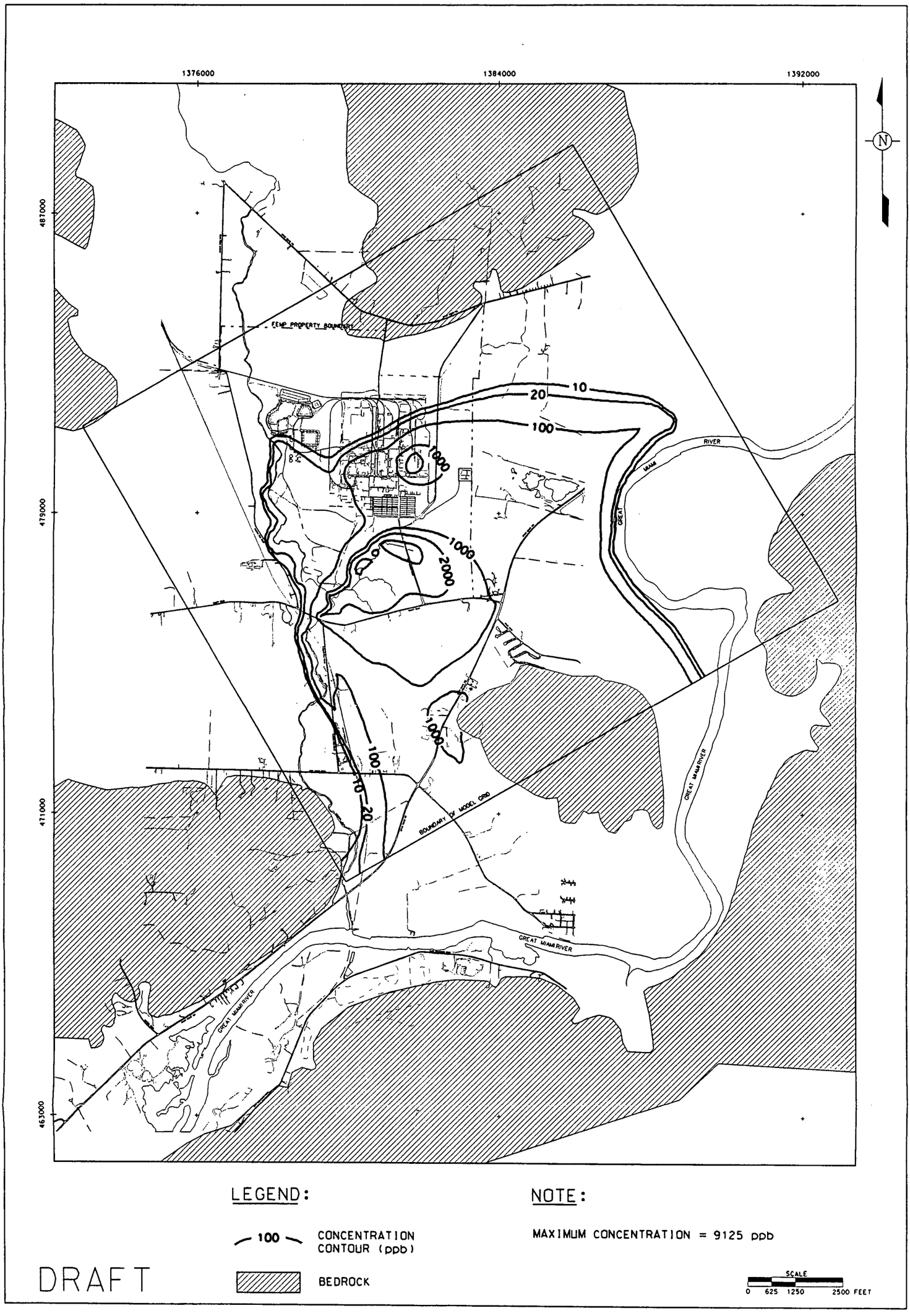

FIGURE F.3.8-3. TOTAL URANIUM K_1/K_d UNCERTAINTY ANALYSIS, CASE 3, PLUME WITH THE MAXIMUM ON-SITE CONCENTRATION AT 990 YEARS

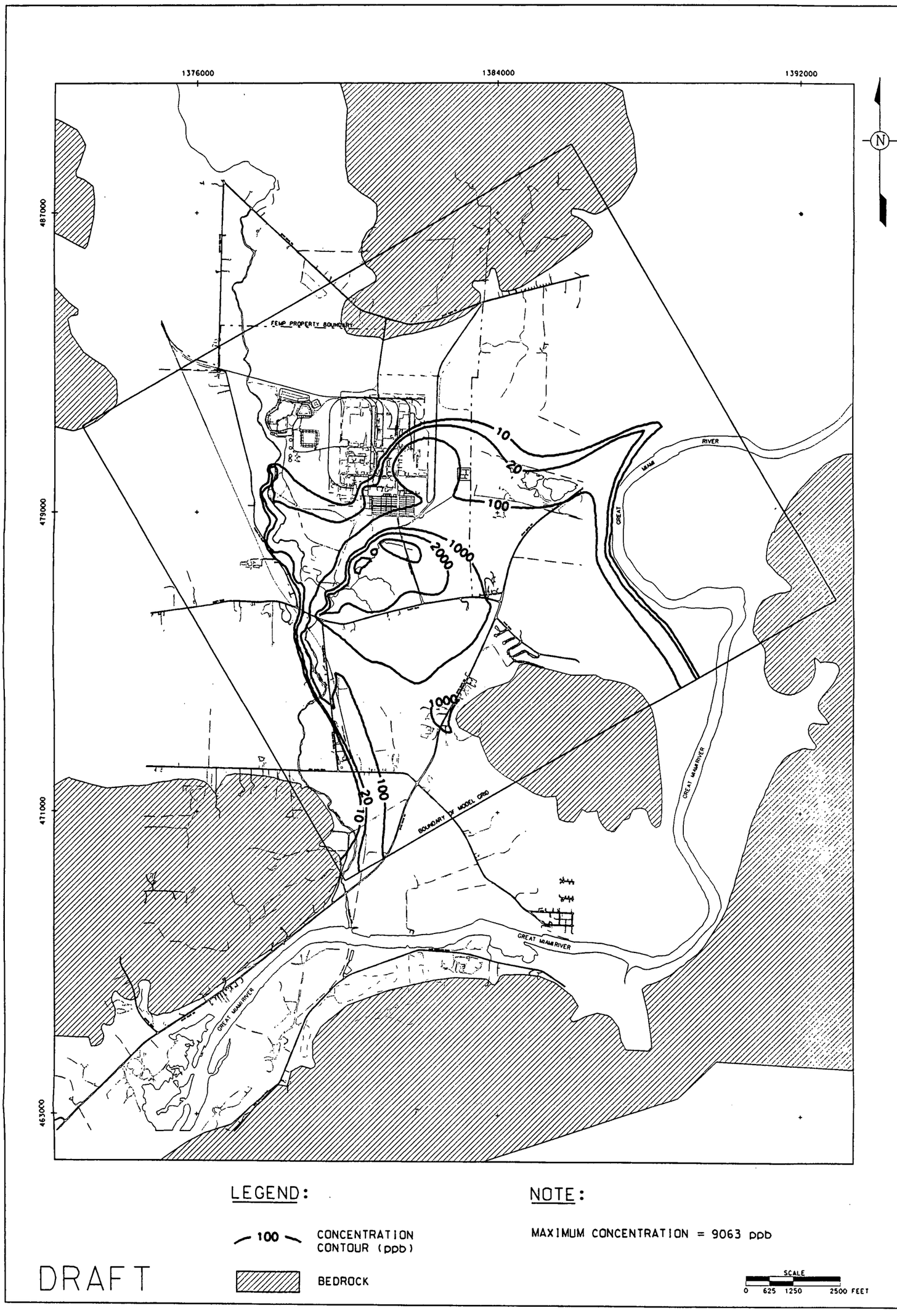

FIGURE F.3.8-4. TOTAL URANIUM K_1/K_d UNCERTAINTY ANALYSIS. CASE 3. PLUME WITH THE MAXIMUM FENCELINE CONCENTRATION AT 550 YEARS

APPENDIX F.3

ATTACHMENT I

HISTORICAL AIRBORNE RELEASE OF URANIUM
AND
GEOCHEMICAL CONCEPTS OF THE SUBSURFACE URANIUM DISTRIBUTION
AT THE FERNALD SITE

F.3.I.1.0 INTRODUCTION

Remediation of uranium-contaminated soil is considered a high priority at the Fernald Environmental Management Project (FEMP). The concepts of leaching and subsequent transport of uranium must be understood for predicting the environmental impact this soil could potentially have on the underlying groundwater quality in the Great Miami Aquifer. This report was prepared to summarize historical airborne uranium releases, type of deposition, form of uranium, and the geochemical conditions which have and will affect uranium migration through the soil column. Finally, this report relates these concepts to the leaching and distribution coefficients (K_l and K_d) used in the uranium fate and transport model for the Operable Unit 5 Remedial Investigation (RI) Report.

Historical releases of uranium are covered in Section F.3.I.2.0 to introduce the forms of uranium present in the existing source areas. In general, uranium releases from the process plants at the site have occurred in the past either as repetitive emissions or as singular, and in some instances, episodic, well-documented events. An example of a singular airborne release is the 1966 UF_6 tank leak at the pilot plant. Episodic UF_6 releases occurred at Plant 7 in the mid-1950s and repetitive airborne releases of various forms of uranium oxide have been emitted from Plants 2/3, 4, and 5. Examples of former repetitive point source releases to the soil are acid bath spills at Plants 2/3, 6, and 8.

In Section F.3.I.3.0, the mobilization of the various uranium forms in the source will be examined from a geochemical perspective. Rainwater will leach the various uranium forms and both dissolved and particulate forms will migrate downward through the soil column with infiltrating rainwater. In general, the soil column is dominated by carbonate minerals in the glacial overburden which is predominently highly fractured and weathered (brown) glacial overburden in the upper 8 to 15 feet of the column underlain by dense gray glacial overburden to a depth of 20 to 50 feet across most of the site. Fractured glacial overburden has a brown appearance due to the oxidation of iron, as this sediment and groundwater are in contact with oxygen in the atmosphere. The gray glacial overburden has not been oxidized because the absence of fractures eliminates the principal atmospheric pathway for oxygen exchange. Dissolution reactions between rainwater and carbonate minerals are the primary control on the porewater and groundwater compositions, resulting in carbonate-rich waters that is effective at complexing and transporting uranium. Adsorption of uranium by the weathered

and unweathered glacial overburden is not significantly different, as the aqueous form of uranium is homogenous throughout the glacial overburden. The surface of the water table in the glacial overburden is about 3 to 5 feet below land surface.

Below the glacial overburden is the highly permeable sand and gravel that contain the Great Miami Aquifer. Due to the high hydraulic conductivity contrast between the glacial overburden and the upper portion of the sand and gravel is unsaturated and the Great Miami Aquifer exists as a second unconfined water table as much as 45 feet below the bottom of the glacial overburden. The composition of groundwater in the Great Miami Aquifer is very similar to groundwater in the glacial overburden. Therefore, the nature and mobility of uranium species in these groundwaters is similar.

Airborne releases of uranium particles have been deposited site wide on the surface of the soil as both highly soluble uranium fluorides and less soluble uranium oxides. Over the 1951 to 1989 period of operation, the uranium fluoride forms in this air-deposited source have been leached and transported into the soil column by infiltrating rainfall. Additionally, uranium oxide particles may have been suspended and carried into the subsurface by infiltrating rainwater. The aqueous uranium derived primarily from dissolution of the uranum fluoride forms migrated into the soil first and the less soluble uranium oxide particles remained at or near the surface. As time progresses, the uranium fluoride forms are depleted from the source and uranium concentrations in the infiltrating rainfall begin to decrease, as the less soluble uranium oxide particles become the primary source for leaching. The nature and extent of these migrating fronts with respect to past, present, and future distribution of uranium is evaluated in Section F.3.I.4.0.

Section F.3.I.5.0 of this report will relate the historical releases and geochemical concepts to the leaching and distribution coefficients (K_l and K_d) used in the uranium fate and transport model for the Operable Unit 5 RI Report. Leaching coefficients are used to determine the input uranium loading as a function of time, and the large range in observed and calculated values (about 1 to 3500 L/kg) reflects the heterogeneity of uranium forms in the source. In contrast, the large range in distribution coefficients (about 1 to 2400 L/kg) reflects the kinetics of adsorption versus desorption, rather than a variety of uranium forms. Adsorption distribution coefficients are well constrained to the range of 11 to 40 L/kg, while desorption coefficients vary from 75 to 2433 L/kg. The lower adsorption values are used to model uranium migration when the source is present, and desorption coefficients are applicable once the source has been removed.

F.3.I.2.0 AIRBORNE RELEASE HISTORY

Uranium releases at the FEMP (known until 1991 as the Feed Materials Production Center) are addressed in this section through discussions of the release mechanisms, routine discharges from production operations, significant episodic releases from plant operations, and nonproduction source releases of primary contamination.

F.3.I.2.1 AIRBORNE RELEASE MECHANISMS

The major features of the FEMP are illustrated in Figure F.3.I.2-1. Plant process operations were limited to a fenced, 136-acre tract known as the production area. Liquid and solid wastes that were generated by the various chemical and metallurgical processes were stored or disposed of in the waste storage area located west of the production area. The cessation of production operations in 1989 essentially eliminated further primary releases to environmental media; secondary release mechanisms and resultant contaminant migration are continuing.

Several mechanisms of airborne release exist for the transport of radiological contaminants to environmental media primarily from process operations and waste management practices. Secondary releases, such as air resuspension of contaminated soil, contributed to further migration and likely transport to other media as outlined in Table F.3.I.2-1.

F.3.I.2.1.1 Primary Discharges From Production Operations

Uranium processing operations within the FEMP production cycle resulted in both routine and episodic primary releases of airborne radiological contaminants to environmental media. Airborne particles and gases were generated during most production, storage and handling operations over some 38 years of processing uranium materials. The principal sources of routine airborne emissions from process operations were dust collector discharges, wet scrubber discharges, and acid-pickling fume stacks. Episodic releases resulted from unplanned incidents arising from either human error, equipment malfunctions, procedures, or situational conditions.

F.3.I.2.1.2 Secondary Releases From Nonproduction Sources

Emissions of uranium from nonproduction sources included those from waste management storage practices, incinerator operations and building exhausts. Fugitive dust generated from the waste

storage pits can be attributed to load-in/load-out operations, wind erosion of stored materials, and vehicle movement in the storage area. Five nonproduction solid/liquid waste incinerators supported the general site operations. Exhausts from buildings located within the production area and the laboratory contributed uranium releases.

F.3.I.2.2 ROUTINE DISCHARGES FROM PRODUCTION OPERATIONS

Routine operations at the FEMP resulted in occasional discharges from the process stacks and by-products, which were handled in a variety of ways. Figure F.3.I.2-2 is a schematic flow diagram of the FEMP process and identifies the major products by each plant. Contamination of environmental media resulted from releases during process operations and from handling and disposition of the by-products that were treated as waste streams. Descriptions of process operations and waste management practices are presented from a broad perspective of how these activities contaminated the environmental media.

The total airborne emissions since operations began in 1951 amount to 179,318 kilograms of uranium (kg U), and are compiled in Table F.3.I.2-2. The total releases are determined by summing the estimated and measured uranium emissions from a number of process stacks and vents. For the purpose of analysis, releases through 1984 were considered inasmuch as airborne emissions beyond that time were relatively insignificant. Uranium discharges from monitored stacks were the only measured emissions. Table F.3.I.2-2 summarizes the annual airborne emissions from all sources at the FEMP since operations were started in the 1950s.

F.3.I.2.2.1 Description of Plant-by-Plant Operations and History

The FEMP began operations in 1951 upon completion of the pilot plant, the site's first operational facility. This plant served as the prototype for the entire FEMP process during the design and construction of the other plants. Plant 6 began operations in 1952, followed by Plants 1, 2/3, 4, 5 and 8 in 1953. Plants 7 and 9 became operational in 1954. Production peaked in 1960 at approximately 12,000,000 kg U. A product decline began in 1964 and reached a low of 1,230,000 kg U in 1975.

The following paragraphs provide an overview of the chemical and metallurgical processes used at the FEMP for the manufacture of uranium metal products (Figure F.3.I.2-3). In general, these processes occurred in seven of the FEMP's more than 50 production, storage and support buildings. Emphasis

is placed on the process chemistry, equipment and uranium species discharged as primary airborne releases during different periods of operation.

F.3.I.2.2.1.1 Plant 1 (Sampling Plant)

Operations began in 1951 for the sampling of impure uranium feed materials. The plant received large quantities of natural, enriched and depleted uranium materials which were sampled and analyzed for uranium assay and isotopic enrichment. Drummed K-65 materials were temporarily stored on the Plant 1 pad in the early 1950s. The plant had 15 dust collectors; dust particles were generally 8 to 24 microns in size and in the form of uranium ores concentrates, and oxides.

F.3.I.2.2.1.2 Plant 2/3 (Refinery)

Operations began in 1953 for the conversion of impure feed materials (received from Plant 1) to pure uranium trioxide (UO_3). This was accomplished by dissolving the feeds in nitric acid; purification by solvent extraction; and thermal decomposition of the purified uranyl nitrate hexahydrate (UNH) solution to produce UO_3, commonly called orange oxide.

Plant 2/3 processed three classes of materials: pitchblende ores as they were mined and shipped to the FEMP; domestic uranium concentrates that had undergone a preliminary refining process at the mill sites; and residues recovered at various stages of FEMP operations. Pitchblende ores contained elevated levels of radium and were processed from 1953 to 1955.

Beginning in 1962, Plant 2/3 was used for processing quantities of residues that were generated by the FEMP processing plants along with those received from several U.S. Department of Energy (DOE) facilities. Residing within the residues received from off site were trace quantities of fission products and transuranics. These feed streams generally contained less than 3 parts per billion (ppb) of transuranics such as plutonium (Pu)-239 and less than 10 parts per million (ppm) of fission products such as technetium (Tc)-99. Plant 2/3 contained four dust collectors and two scrubbers. Releases included small UO_3 particles which penetrated the scrubbers, UNH, and radium (Ra)-226.

F.3.I.2.2.1.3 Plant 4 (Green Salt Plant)

Operations began in 1953 for the conversion of pure UO_3 (received from Plant 2/3) to pure uranium tetrafluoride (UF_4), commonly called green salt. This was accomplished by a two-step process that reduced UO_3 with hydrogen to form uranium dioxide (UO_2), which was then converted to UF_4 by

reaction with anhydrous hydrogen fluoride. Plant 4 contained 12 dust collectors. Dust particles were 2 to 22 microns in size and ranged from 50 to 81 percent uranium (UO_2, UO_3, U_3O_8, and UF_4). Discharges of UF_4 are estimated to contain 2 percent UO_2F_2, a uranium species side product from the Plant 4 process.

F.3.I.2.2.1.4 Plant 5 (Metals Production Plant)

Operations began in 1953 for the conversion of pure UF_4 (received from Plant 4) to uranium metal derbies by high-temperature reduction using magnesium metals granules. After heating for 3 to 4 hours at approximately 1200°F, the UF_4 and the magnesium would initiate an exothermic reaction. The resulting product was a 300- to 375-pound piece of pure uranium metal and a by-product, magnesium fluoride slag. The resultant piece of uranium metal had the shape of a gentleman's hat, or derby; therefore, these pieces were called derbies. Most of the derbies were recast to form ingots for further processing at the FEMP, but some were shipped directly or cast into flat billets. Graphite crucibles were machined and the magnesium fluoride slag milled for reuse in reduction pots. Plant 5 contained 17 dust collectors. Dusts in the reduction area were mostly UF_4 and U_3O_8 in magnesium fluoride slag. Remelt area dusts were mostly U_3O_8. Dust particles were 0.5 to >44 microns in size.

F.3.I.2.2.1.5 Plant 6 (Metals Fabrication Plant)

Operations began in 1952 for the fabrication of finished cores from normal uranium cylindrical ingots received from Plant 5 via rolling mill, heat treat and machining operations. Later, enriched and depleted uranium ingots were machined in Plant 9 and heat treated in Plant 6 for shipment to Reactive Metals, Inc. (RMI) Company located in Ashtabula, Ohio. At RMI, uranium ingots were extruded into tubes for return to Plant 6 at the FEMP where they were cut into sections, heat treated, machined to final dimensions, and inspected for final product quality. The completed target element cores were shipped to the Savannah River Plant. Ingots consisting of slightly enriched uranium were upset forged, machined, and shipped from RMI to the Hanford site. Scrap metal that was generated during the various metal production and fabrication steps was pickled in nitric acid to remove oxide contamination and progeny products before recycling via remelt casting operations. Chips and lathe turnings were crushed, pickled, rinsed, dried, briquetted, and recycled to remelt casting operations. Plant 6 contained three dust collectors and three electrostatic precipitators. The principal airborne emission path from Plant 6 was the acid-vapor exhaust from the stack that ventilated the pickling tank, two wash tanks, and the exhaust from the briquetting operations.

F.3.I.2.2.1.6 Plant 7 (Hex Reduction Plant)

Operations began in 1954 for the conversion of UF_6 received from the gaseous diffusion plants to produce high purity UF_4 as a supplement to the Plant 4 production. Actual production ran from 1954 to 1956; the plant contained four dust collectors.

F.3.I.2.2.1.7 Plant 8 (Scrap Recovery Plant)

Operations began in 1953. Plant 8 processed impure metals and residues including off-specification UO_3 and UF_4, magnesium fluoride slag, crucible burnout, ingot top crops, sump cakes, chips, and sawdust received from nearly all the production plants. High-grade scrap, such as machining chips and turnings, were oxidized to U_3O_8 in an oxidation furnace or burned in a box furnace. Fine material (<8 mesh) was sent to Plant 2/3; coarse material (>8 mesh) was further oxidized in a muffle furnace. The furnaces were vented to wet scrubbers before gases were discharged to the atmosphere.

F.3.I.2.2.1.8 Plant 9 (Special Products Plant)

Uranium operations began in 1957. Plant 9 originally conducted casting and cropping of ingots from Plant 5. Cropped billets from Plant 5 were drilled and machined for further processing in Plant 6. Beginning in 1961, the Zirnlo process was used to recover rejected coextrusion sections from the fuel fabrication operation at Hanford. The process used dilute hydrofluoric acid to remove zirconium followed by nitric acid for copper removal from uranium cores. The decladded cores were then recycled through Plant 5 remelt casting operations. The acid tanks had an exhaust stack with a blower. Core pickling was used from 1961 to 1963; briquetting of uranium and thorium was performed from 1953 to 1963.

F.3.I.2.2.1.9 Pilot Plant

Operations began in 1951. During the early years, the pilot plant produced limited quantities of enriched uranium metal. Box furnaces were used to process U_3O_8, enriched uranium turnings and "sawdust" generated in the production of enriched uranium cores. Crucibles were plasma coated in the pilot plant. Material up to 3.85 percent enrichment was processed to metal via the UF_6 reduction process. Most uranium operations were suspended during the thorium production that occurred between 1967 and 1975.

Conversion of UF_6 to uranium tetrafluoride (UF_4) began by heating the UF_6 in an autoclave to transform the solid into a gas. The gaseous UF_6 was then reduced with hydrogen to form UF_4. The UF_4 was feed material for Plants 5 and 9. The offgas from the production of UF_4 consisted of hydrogen, nitrogen, hydrogen fluoride, uranium tetrafluoride, a carbon trap to remove unreacted uranium hexafluoride, a two-stage refrigerated condenser system to remove anhydrous hydrogen fluoride, and a water scrubber to remove trace aqueous hydrofluoric acid before being vented to the atmosphere. Equipment in the pilot plant was used for a variety of special production operations. The dust from the collectors in the pilot plant was 9 to 44 microns in size and assayed approximately 80 percent uranium in the form of UO_3, U_3O_8, and UF_4.

F.3.I.2.2.2 Time/Form Characterization of Plant Discharges

The principal sources of airborne emissions from FEMP processing operations were:

- Dust collector stack discharges
- Wet scrubber discharges
- Acid-pickling fume stacks.

Airborne releases from these sources totaled 169,147 kg U through 1984, and are characterized in the following subsections.

When combined with the release of 8891 kg U from nonproduction sources (Sections F.3.I.2.3 and F.3.I.2.4), the FEMP total comes to 178,038 kg U through 1984 (see Table F.3.I.2-2).

F.3.I.2.2.2.1 Dust Collector Stack Discharges

Dust collector stack discharges were the principal sources of airborne emissions during the span of FEMP operations from 1951 to 1984. Airborne releases of uranium from plant stacks totaled 94,590 kg U and are characterized as follows:

Plant	Stacks (kg U)	Percent	Principal U Species
1	985	1	U Ores, U_3O_8
2/3	3219*	3	U Ores, U_3O_8, UO_3
4	33,217	35	UO_3, U_3O_8, UF_4/UO_2F_2
5	26,189	28	U_3O_8, UF_4/UO_2F_2
6	1204	1	U_3O_8

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Plant	Stacks (kg U)	Percent	Principal U Species
7	13,272	14	UF_4
8	10,773	12	U_3O_8, UAP, UCl_4
9	2599	3	U_3O_8, UF_4/UO_2F_2
Pilot**	3132	3	U_3O_8, UF_4
Total	94,590	100	

*Estimated releases due to gulping operations (38179.3 kg U) have been subtracted from the Table F.3.I.2-2 total for Plant 2/3 and will be covered in Section F.3.I.2.2.2.2.

**Estimated episodic release in 1966 (1195 kg) was subtracted from Table F.3.I.2-2 total for the pilot plant because it was not released through the dust collector stacks.

The Plant 8 scrubbers discharged another 36,378 kg U, primarily in the form of uranyl ammonium phosphate (UAP) and uranous tetrachloride from the dissolution of U-metal in hydrochloric acid. Each plant discharged dust as uranium residues from processing operations. Plants 4, 5, and 9 discharged UO_2F_2 as a companion side-product contained in UF_4. Estimates of dust collector discharges from all FEMP processing plants categorized by U species follow:

Uranium Species	kg U	Percent of Total
Ores	3590	4
U_3O_8, UO_2	66,649	70
UO_3	149	<1
UF_4	23,387	25
UO_2F_2	194	<1
UCl_4	28	<1
UAP*, ADU**	593	<1
Total	94,590	

*Uranyl ammonium phosphate
**Diammonium diuranate

Ninety-five percent of the discharges were oxides and green salt. Stack discharges from Plants 4 and 5 comprised 63 percent of the total discharged from the FEMP processing plants. It should be noted that dust collector discharges from Plants 2/3 and 8, when combined with emissions from gulping operations and the wet scrubber discharges, together accounted for 52 percent (88,549 kg U),

as discussed in Section F.3.I.2.2.2.2. Also, Plant 7 discharged 14 percent of the FEMP total in just three years of its operation between 1954-56. Most of the FEMP releases occurred during the first 20 years of plant operations (Section F.3.I.2.2.2.3). A breakdown of uranium stack discharges by plant, species and time is summarized in Table F.3.I.2-3.

F.3.I.2.2.2.2 Wet Scrubber and Acid-Pickling Discharges

Wet scrubber discharges over the four decades of FEMP operations resulted from Plant 2/3 gulping operations and wet scrubbers in Plant 8. Acid-pickling operations in Plants 6 and 9 further contributed to these uranium emissions. Releases of 38,179 kg U as uranyl nitrate are estimated from the Plant 2/3 gulping operations (Table F.3.I.2-4) and 36,378 kg U from the Plant 8 wet scrubbers (Table F.3.I.2-2). Emissions from the Plant 6 and 9 acid-pickling sources are judged to be relatively insignificant. The impact of these emissions to the environmental media is in the discharge of acidic vapors that are conducive to promoting solubilization of particulate uranium species released from other sources.

F.3.I.2.2.2.3 Historical Discharges of FEMP Dust Collector and Wet Scrubbers

Historical discharges of FEMP dust collector and wet scrubbers are listed below:

	Discharges (kg U)				
Plant	1950s	1960s	1970s	1980s	Total
1	642	252	57	34	985
2/3	14,556	13,249	12,804	789	41,398
4	27,861	4350	336	670	33,217
5	22,978	2407	332	472	26,189
6	449	751	2	2	1204
7	13,272	0	0	0	13,272
8	12,251	21,675	1952	273	47,151
9	1096	1159	168	176	2599
Pilot	1934	1179	13	6	3132
Total	95,039	56,022	15,664	2422	169,147
Percent	37	33	9	1	100

The significance of the time characterization is that the substantial quantities of uranium discharged during the initial years of operation have had ample opportunity to come into solubility equilibrium

with environmental media, undergo slow hydrolysis to other uranium species, or have migrated by transport to other media.

F.3.I.2.2.3 Dose Reconstruction Project Release Estimates

In November 1993 a draft report entitled "The Fernald Dosimetry Reconstruction Project – Radionuclide Source Terms and Uncertainties" was issued for review by the Radiological Assessments Corporation (RAC) under contract to the Centers for Disease Control (CDC). The report was prepared to support an initiative being undertaken by the CDC to reconstruct the potential radiological doses received by members of the public residing around the FEMP as a result of environmental discharges during the facility's 38-year operational history.

Within the draft CDC report, RAC evaluated the projected quantities and characteristics of radiological contaminants released to the environment from facility operations. Existing FEMP historical release estimates, as presented in the DOE's remedial investigation/feasibility study (RI/FS) documents, were based upon an evaluation of historical stack monitoring data and production records by FEMP scientific staff members. The RAC estimates employed a probabilistic approach to projecting these same historical release levels.

The probabilistic-based estimates completed by RAC included use of Monte Carlo methods to evaluate the propagation of uncertainty in the estimating process. These Monte Carlo simulations were completed for total site dust collector emissions, Plant 8 scrubber emissions, Plant 2/3 scrubber discharges, and radon released from the site. In general, the best estimate of the mass of releases from these sources, as projected by RAC, were, on average, approximately 250 percent higher than similar estimates completed by the FEMP. The primary differences reside in the estimation of releases from the Plant 8 scrubbers (385 percent higher release estimates) and the site-wide dust collection systems (265 percent higher emission estimates).

No attempt has been made to reconcile the differences between the two estimates of total mass of historical site emissions. For the purposes of this report, it is the types of uranium chemical forms (species) that are of significance to the report's findings, not the total mass of contaminants released. The differences in projected total quantities of emissions is not considered significant to the identification of geochemical parameters for fate and transport modeling, which is dependent on the species of uranium forms historically released.

F.3.I.2.3 SIGNIFICANT EPISODIC RELEASES FROM PLANT OPERATIONS

F.3.I.2.3.1 Plant 7 Releases of UF_6 in 1954-55

Eyewitness accounts have stated frequent releases of UF_6 during the start-up and early operation of Plant 7 in the 1954 period. During these incidents, building windows were closed and laboratory ventilation hoods were shutdown until the visible white plume of UF_6 dissipated from cylinders placed on-line for operations. Quantities released as UF_6 have been estimated to be 252 kg U during the operation of Plant 7.

F.3.I.2.3.2 Pilot Plant Releases of UF_6 in 1966

On February 14, 1966, an unmonitored release of 1195 kg U as UF_6 occurred during a one-hour period, beginning at 8:40 a.m. At that time winds were from the north/northwest at 5 mph. The release point was about 6 feet above the ground and resulted from a valve being inadvertently removed. Releases of another 264 kg U have been estimated for other intermittent periods of operation.

F.3.I.2.3.3 Plant 2/3 Releases of UNH/Nitric Acid Vapor

Quantities of uranium were emitted from the Plant 2/3 gulping system as a vapor mist of UNH solution in nitric acid. These emissions occurred when UO_3 was removed by vacuum gulping from denitration pots. Estimates of 38,179 kg U discharged were based on uranium production records, measurements of U content in acid mists, and collection efficiency expected from the entire particulate control system. Releases totaling 272 kg U have been estimated based on two specifically documented incidents.

F.3.I.2.3.4 Other Nonroutine Production Discharges

Emissions of uranium from metal fires and solid spills occurring outdoors have been estimated to be 907 kg U and 1059 kg U, respectively, over the period of FEMP operations through 1984. Uranium metal fires generally occurred on the east storage pads of Plants 6 and 8, where drums of machining chips and turnings were stored for the pickling and briquetting operations. Outdoor spills amounting to 37 kg U occurred during the interplant shipment of uranium compounds, usually from a drum falling from a transport trailer.

F.3.I.2.4 NONPRODUCTION SOURCE RELEASES OF PRIMARY CONTAMINATION

F.3.I.2.4.1 Incineration

Five nonproduction incinerators supported the general site operations. Discharges from these incinerators were as follows;

- Old solid waste incinerator at the sewage treatment plant (2480 kg U)
- Oil burner (463 kg U)
- Graphite burner (125 kg U)
- New solid waste incinerator (12 kg U)
- Liquid organic waste incinerator (17 kg U)

555 Uranium releases from these sources are estimated to be 3087 kg U (Table F.3.I.2-2) for the FEMP's operational period. The likely form of airborne discharges from the five nonproduction burners and incinerators is U_3O_8 because these units functioned to oxidize the lower oxidation state uranium compounds. The oil burner and liquid waste incinerator processed hydrocarbons whose residue could have contained phosphorus in a uranium oxide matrix. Likewise, the old solid waste incinerator could have contained phosphorus plus metal oxides in a uranium oxide matrix. The graphite burner operated only on contaminated graphite and only yielded U_3O_8, as the carbon burned off. The new solid waste incinerator operated mostly on miscellaneous contaminated trash (paper, cardboard, wood, etc.,) that yielded only U_3O_8. Any lower oxidation state uranium compound would not remain after processing under incineration conditions of heat and air. It is possible that quantities of phosphorus or fluoride compounds would exist to some extent given that a wide variety of chemical processing took place, but the likely form of release is U_3O_8.

F.3.I.2.4.2 Storage

Up to 1984, on-property disposal of solid and slurried wastes at the FEMP occurred in pits and silos. Transport of solid wastes to the pits was dependent on the type of wastes generated and the type of storage containers. In general, drummed wastes were transported on flat-bed trailers; metal dumpsters were carried by dumpster vehicles; bulk wastes were transported by dump trucks and trailers; and drummed pyrophoric metal was conveyed on four-wheeled flat-bed trailers pulled by two tractors. At the waste storage area, dump trucks, dump trailers, dumpster units, and drummed wastes were emptied directly onto the pits' edges. The material was then pushed into the pits by either a bulldozer or a dragline scraper. Loose contamination was washed from bulldozers, the dragline scraper, vehicles, dumpsters, and fork trucks with water at the pits. Fugitive airborne uranium

emissions at the waste pits have been estimated to be 1371 kg U for the FEMP operational period through 1984 (Table F.3.I.2-4).

F.3.I.2.4.3 Other Emissions

Estimates of uranium releases from building exhausts and laboratory emissions have been estimated to be 379 kg U and 68 kg U, respectively, for the FEMP operational period through 1984 (columns numbered 4 and 5, Table F.3.I.2-4). The likely form of release is U_3O_8 or intermediate uranium compounds specific to each processing plant.

TABLE F.3.I.2-1

SUMMARY OF SITE CONTAMINATION

Potential Source	Release Mechanisms	Affected Media/Pathways
Process Operations (OU3) Dust collectors Scrubbers Fugitive emissions Wastewater discharges Storm water discharges Process material handling Underground storage tanks Process piping Sewage treatment plant	Air emissions Process emissions Building exhausts Fugitive emissions Wastewater/storm water discharges	Air Suspended particulates Radon gas Soil → Direct radiation → Air resuspension → Groundwater via leaching → Storm water runoff ↓ Surface water/sediment ↓ Groundwater recharge
Waste Management OU1 OU2 OU4 Regulated units Soil/debris piles Scrap metal piles	Land disposal/storage practices Spills/Leaks Process materials Wastewater	Surface water/sediment ↓ Groundwater recharge Direct radiation

TABLE F.3.I.2-2

URANIUM EMISSIONS FROM FEMP AIRBORNE RELEASES

	Uranium Emissions (kg) by Source														
	Dust Collectors														
Calendar Year	Plant 1	Plant 2/3[a]	Plant 4	Plant 5	Plant 6	Plant 7	Plant 8	Plant 9	Pilot Plant	Total	Plant 8 Wet Scrubbers[b]	Non-production Sources[c]	Other Sources[d]	Total Emissions	% of Total
1951	-	-	-	-	-	-	-	-	123	123.0	-		2	125.0	0.1
1952	-	-	-	-	6	-	-	-	493	499.0	-		44	543.0	0.3
1953	3.8	6	1473	90	12	-	-	-	493	2077.8	-		105	2182.8	1.2
1954	46.2	281	5890	4119	28	4261	201	0	271	15097.2	217	15	157	15486.2	8.7
1955	46.2	1113	12450	10410	53	7268	877	0	443	32660.2	948	118	167	33893.2	19.0
1956	43.4	1978	5145	3501	27	1743	1316	0	32	13785.4	1442	118	174	15519.4	8.7
1957	49.4	3730	814	3664.4	35	-	791	0.4	18	9102.2	1575	118	230	11025.2	6.2
1958	407.4	3520	661	715	161	-	875	679	27	7045.4	1650	118	242	9055.4	5.1
1959	46	3929	1428	478.4	127	-	260	417	34	6719.4	2100	118	240	9177.4	5.2
1960	20	4233	212	202.8	268	-	298	219	718	6170.8	2604	118	260	9152.8	5.1
1961	52.8	3707	262	76.2	119	-	209	67.4	174	4667.4	2371	118	271	7427.4	4.2
1962	14	2137	703	356	59	-	618	135	174	4196.0	2304	138	304	6942.0	3.9
1963	82.6	0	1469	783	181	-	994	159	51.8	3720.4	2171	145	339	6375.4	3.6
1964	18	0	545	330.4	34	-	1051	252	13	2243.4	2865	145	330	5583.4	3.1
1965	4.1	192.7	334.7	226.5	42.6	-	390	68	10	1268.6	5810	146.2	269	7493.8	4.2
1966	12.2	514	227.7	76.7	11.3	-	327	48.5	1213[c]	2430.4	926	152	222	3730.5	2.1
1967	20.4	646.8	279.9	147.9	2.7	-	417	76.2	11.8	1602.7	1790	152	181	3725.7	2.1
1968	0.5	1119.5	267.2	88	30.4	-	901	121.0	3.6	2531.2	3082	152	120	5885.2	3.3
1969	27.2	698.2	49.4	119.3	2.7	-	424	12.7	3.6	1337.1	3123	128	120	4708.1	2.6
1970	4.5	356.7	29.9	53.1	0	-	569	13.6	0	1026.8	666	105	185	1982.8	1.1
1971	9	306	0	0	0	-	91	0	0	406.0	541	105	40	1092.0	0.6
1972	28.4	1360	9	33	0	-	5	24	0	1459.4	-	105	37	1601.4	0.9
1973	1	1396	57	79	0	-	14	15	0	1562.0	39	105	33	1739.0	1.0
1974	1.4	2445	24.4	40	0	-	11	38	0	2559.8	-	105	32	2696.8	1.5
1975	5.6	2844.7	119.8	19	0	-	3.5	0	0.4	2993.0	-	105	40	3138.0	1.8
1976	2.7	3339.2	26.1	13.7	2.4	-	7.2	2.8	0	3394.1	-	105	40	3539.1	2.0
1977	0.6	756.2	11.8	53.3	0	-	4.6	0	10.4	836.9	-	105	36	977.9	0.5
1978	1.8	0	11.9	29.1	0	-	0	72	2.2	117.0	-	105	39	261.0	0.1

TABLE F.3.I.2-2 (Continued)

	Uranium Emissions (kg) by Source														
	Dust Collectors														
Calendar Year	Plant 1	Plant 2/3[a]	Plant 4	Plant 5	Plant 6	Plant 7	Plant 8	Plant 9	Pilot Plant	Total	Plant 8 Wet Scrubbers[b]	Non-production Sources[c]	Other Sources[d]	Total Emissions	% of Total
1979	0.8	0	46.3	12.3	0	-	0	2.3	0	61.7	-	93	45	199.7	0.1
1980	13.4	2.7	133.8	89.5	0	-	5.1	0	3.3	247.8	11	7.7	50	316.5	0.2
1981	1.3	30	432.1	135.6	0	-	0	0	0	599.0	10	8.2	60	677.2	0.4
1982	2.1	52.3	21	121.8	0.5	-	81.2	5.1	0	284.0	37	8.8	65	394.8	0.2
1983	6.4	130	42.9	41.4	0	-	24.7	0	0	245.4	58	7.8	65	376.2	0.2
1984	12.1	574.3	39.6	83.9	1.0	-	8.1	170.9	28	917.9	38	16.8	66	1013.5	0.6
Sub-Total	985.3	41398.3	33216.5	26189.3	1203.6	13272.0	10773.4	2598.9	4326.0	133963.3	36378.0	3086.5	4610.0	178037.8	99.4%
% of Sub-Total	0.6%	23.3%	18.7%	14.7%	0.7%	7.5%	6.1%	1.5%	2.4%	75.2%	20.4%	1.7%	2.6%	100.0%	
1985	1.1	133.9	10.2	12.4	0.0	-	4.0	2.2	6.5	170.3	24.7	-	64.0	259.0	0.1%
1986	0.0	167.0	5.6	6.7	0.0	-	2.5	1.2	3.4	186.2	105.5	-	68.0	359.7	0.2%
1987	0.0	200.0	0.9	1.0	0.0	-	0.9	0.1	0.3	203.2	32.2	-	60.0	295.4	0.2%
Sub-Total (1951-1987)	987.0	41849.2	33233.2	26209.4	1203.6	13272.0	10780.8	2602.4	4336.2	134523.6	36540.4	3086.5	5074.0[f]	179244.5[fg]	94.9[g]
% of Sub-Total	0.6%	23.4%	18.5%	14.6%	0.7%	7.4%	6.0%	1.5%	2.4%	53.5%	20.4%	1.7%	2.8%	100.0%	
1988	0.0	66.4	2.2	1.6	0.5	-	0.6	0.2	1.2	72.7	15.6	-	17.8	126.1	0.1%
1989	0.1	0.0	0.3	0.4	0.4	-	0.3	0.2	-	1.7	3.8	-	6.9	12.1	0.0%
1990	-	-	-	-	-	-	-	-	-	0.0	-	-	1.7	1.7	0.0%
1991	-	-	-	-	-	-	-	-	-	0.0	-	-	0.2	0.3	0.0%
1992	-	-	-	-	-	-	-	-	-	0.0	-	-	0.1	0.2	0.0%
1993	-	-	-	-	-	-	-	-	-	0.0	-	-	0.2	0.2	0.0%
Total	987.1	41965.6	33235.7	26211.4	1204.5	13272.0	10781.8	2602.8	4337.4	134598.3	36559.7	3086.5	5103.4[f]	179318.5[f]	100%
% of Total	0.6%	23.4%	18.5%	14.6%	0.7%	7.4%	6.0%	1.5%	2.4%	75.1%	20.4%	1.7%	2.8%	100%	

[a]Includes emissions from gulping of uranium trioxide.
[b]Data are on a fiscal year basis: 1952-1976 July 1 - June 30; 1976 transition and; 1977 and after, October 1 - September 30
[c]Consists of:
Old solid waste incinerator (1954-1979) 2474.7 kg
Old burner (1962-1979) 462.9 kg

TABLE F.3.I.2-2 (Continued)

Graphite burner (1965-1984)	124.6	kg
New solid waste incinerator (1980-1984)	<20	kg
Liquid organic waste incinerator (1983-1984)	<20	kg
	3086.5	kg

[d]Includes other process emissions, buildings exhausts, laboratory emissions, fugitive emissions from waste pits, and nonroutine events.
[e]Includes 1195 kg unmonitored release of UF_6 on February 14, 1966.
[f]Includes an additional 272 kg from nonroutine events not distributed over production years (concentrated liquid uranyl nitrate hexahydrate releases).
[g]Some totals differ from other published reports but differences are insignificant
Sources: 1951-1987 (Boback et al. 1987 "History of FMPC Radiological Discharges," FMPC-2082 prepared for DOE, Oak Ridge Operations Office, Oak Ridge, TN.
Clark, et al. 1989, "History of FMPC Radionuclide Discharges - Revised Estimates of Uranium and Thorium Air Emissions from 1951-1987," Addendum to FMPC-2082, prepared for DOE, Oak Ridge Operations Office, Oak Ridge, TN.
1988-1993 (DOE Radioactive Effluent Information System/On-Site Discharge Information System Data Reports, 1989-1994)

TABLE F.3.I.2-3

ESTIMATE OF FORM OF URANIUM STACK DISCHARGES BY DECADE (Kg)

Plant	Species[a]	1950s	1960s	1970s	1980s	Species Total	Plant Total
1	ORES	642	149	0	0	791	
	U_3O_8	0	103	57	34	194	985
2/3	ORES	1788	414	597	0	2799	
	U_3O_8	199	45	105	6	355	
	UO_8	0	0	62	3	65	3219
4	UO_3	0	75	0	8	83	
	U_3O_8	21,349	3468	29	18	24,864	
	UF_4	6382	791	301	631	8105	
	UO_2F_2	130	16	6	13	165	33,217
5	U_3O_8	22,185	2230	322	436	25,173	
	UF_4	777	176	10	36	999	
	UO_2F_2	16	0	0	0	16	26,188
6	U_3O_8	449	751	2	2	1204	1204
7	UF_4	13,272	0	0	0	13,272	13,272
8	U_3O_8	4089	5239	706	119	10,153	
	UAP	222	371	0	0	593	
	UCl_4	9	19	0	0	28	10,774
9	U_3O_8	672	696	168	176	1712	
	UF_4	416	371	0	0	874	
	UO_2F_2	8	5	0	0	13	2599
Pilot	U_3O_8	1912	1064	13	5	2994	
	UF_4	22	115	0	1	138	3132
Total		74,537	16,187	2378	1488	94,590	

[a] U_3O_8 = uranium oxide
UO_3 = uranium trioxide
UF_4 = uranium tetrafluoride
UO_2F_2 = uranium fluoride
UAP = uranyl ammonium phosphate
UCl_4 = uranium tetrachloride

TABLE F.3.I.2-4

FEMP AIRBORNE EMISSIONS SUMMARY IN KILOGRAMS

Year	1 Uranium FMPC-2082 Totals	2 Uranium Gulping Emissions	3 Other Uranium Process Emissions	4 Uranium Emissions Building Exhausts	5 Uranium Estimated Laboratory Emissions	6 Uranium Fugitive Emissions Waste Pits	7 Uranium Emissions Nonroutine Events	8 Total Uranium Emissions*
1951	123.0	0	0	0	2	0	0	125
1952	499.0	0	0	0	2	0	42	543
1953	2077.8	0	3	1	2	0	99	2183
1954	15,119.2	210	8	5	2	0	142	15,486
1955	32,976.2	750	11	11	2	1	142	33,893
1956	13,595.4	1750	12	16	2	2	142	15,519
1957	8045.2	2750	12	26	2	48	142	11,025
1958	5513.4	3300	14	31	2	95	100	9055
1959	5127.4	3810	15	28	2	95	100	9177
1960	4872.8	4020	17	33	2	108	100	9153
1961	3516.4	3640	18	30	2	121	100	7427
1962	4568.0	2070	19	26	2	125	132	6952
1963	6036.4	0	19	25	2	125	168	6375
1964	5253.4	0	22	20	2	129	157	5583
1965	7044.8	180	22	19	2	71	155	7494
1966	3048.5	460	12	16	2	49	143	3731
1967	2924.7	620	11	16	2	11	141	3726
1968	4655.2	1110	7	14	2	12	85	5885
1969	3898.1	690	7	8	2	15	88	4708
1970	1487.8	310	6	6	2	16	155	1983

TABLE F.3.I.2-4 (Continued)

Year	1 Uranium FMPC-2082 Totals	2 Uranium Gulping Emissions	3 Other Uranium Process Emissions	4 Uranium Emissions Building Exhausts	5 Uranium Estimated Laboratory Emissions	6 Uranium Fugitive Emissions Waste Pits	7 Uranium Emissions Nonroutine Events	8 Total Uranium Emissions*
1971	772.0	280	5	2	2	16	15	1092
1972	614.4	950	4	3	2	15	13	1601
1973	496.0	1210	5	3	2	15	8	1739
1974	234.8	2430	4	6	2	14	6	2697
1975	318.0	2780	4	7	2	18	9	3138
1976	169.1	3330	5	7	2	20	6	3539
1977	191.9	750	5	2	2	20	7	978
1978	222.0	0	4	2	2	22	9	261
1979	154.7	0	4	1	2	31	7	200
1980	266.5	0	4	2	2	34	8	317
1981	587.2	30	5	2	2	42	9	677
1982	279.8	50	6	2	2	41	14	395
1983	181.2	130	6	4	2	40	13	376
1984	377.5	570	6	5	2	40	13	1014
Total	135,473.6	38,179	319	379	68	1371	2780**	
					Total Uranium			179,058 kg

NOTE: Numbers may not add due to round-off.
*The 1985, 1986 and 1987 emissions as reported in the Environmental Monitoring Annual Reports have been added into the column total.
**Includes 272 kg U from estimated emissions not distributed over production years.

F.3.I.3.0 GEOCHEMICAL PROCESSES INFLUENCING THE URANIUM DISTRIBUTION

F.3.I.3.1 RAINWATER/SOIL CHEMISTRY

Rainwater falling on soil media will react with minerals/solids and organic material to form porewater. The geochemistry of porewater is controlled by the pH of the rainwater, activity of carbon dioxide (CO_2) in the water/soil system, and the solubility of various minerals or leaching of solids in the soil. A mineralogical summary of FEMP soils is provided in Table F.3.I.3-1. At the FEMP site, the moderately low pH of the rainwater (about 5) is raised by dissolution reactions with carbonate mineral fragments (dolomite and calcite) present in the soil. Rainwater dissolution reactions are most likely to occur in the upper few feet of the glacial overburden, and these reactions affect the leaching of uranium from near-surface sources. The pH of the water/soil system will be buffered in the range of 7 to 8 by carbonate mineral (e.g., $CaCO_3$) dissolution, CO_2 dissolution, and carbonic acid (H_2CO_3) dissociation. Important reactions in this system are:

(1) $CaCO_3 + H_2O <-> Ca^{+2} + HCO_3^- + OH^-$

(2) $CO_2 + H_2O <-> H_2CO_3$

(3) $H_2CO_3 <-> H^+ + HCO_3^-$

The dissolution of $CaCO_3$ in water (Reaction 1) contacting air containing about 0.03 percent CO_2 results in an equilibrium pH of about 8. Lower pH values are generally observed in FEMP soil because the activity of CO_2 (i.e., partial pressure of CO_2) in the soil is greater than in the air, due to decomposition of organic debris and respiration of microorganisms. The higher CO_2 activity in soil drives Reaction 2 to the right to produce more H_2CO_3, which dissociates immediately (Reaction 3) to release H^+ and lower the pH. The large reservoir of carbonate minerals (30 to 50 percent of the soil) and biogenic sources of CO_2 allow the water/soil system to be buffered between 7 and 8 by the interplay of the above three reactions.

Silicate minerals present in the soil (e.g., quartz, feldspar, and clay minerals) have less influence on the chemistry of the porewater due to their low solubilities (relative to carbonate minerals) at near neutral pH values. These minerals provide silica, potassium, sodium, aluminum, and various trace metals to the porewater via dissolution and ion-exchange reactions. The weathered surface area of these minerals plays an important part in the adsorption of ions from the porewater.

F.3.I.3.2 LEACHING OF URANIUM SOLIDS

299 Uranium solids present in near-surface sources will be leached by rainwater to form a portion of the dissolved constituents (i.e., solute) delivered to the porewater. Leaching refers to removing constituents from the solid by desorption, ion exchange, and dissolution reactions. In this sense, dissolution of a solid is a subset of leaching. The extent and time (kinetics) of dissolution are primarily functions of temperature, surface area, and bond type (e.g., ionic, covalent, etc.,) in the mineral structure. The extent of mineral dissolution is expressed mathematically by the solubility product, and solubility products have been tabulated for a large number of minerals as a function of temperature. However, the time required to dissolve a given mineral to its solubility concentration is dependent on both temperature and mineral surface area. The surface area of a soil mineral is highly variable from soil to soil and this mineral commonly has an alteration rind, which precludes the use of results generated from laboratory studies on dissolution rates of unweathered minerals. What can be said in qualitative terms is that at ambient surface and subsurface temperatures, solids formed by ionic bonding (e.g., UF_4) will dissolve and approach their equilibrium concentrations on the order of days to months, whereas solids with covalent bonds (e.g., U_3O_8) may take months to years to approach their solubility concentrations. To illustrate the extent of dissolution, consider the solubility of the two most common uranium species released from past FEMP operations (U_3O_8 and UF_4; Section F.3.I.2.2.2.1) in rainwater of pH 5 at 25°C with an oxygen partial pressure of 1×10^{-30} atmospheres (corresponding to an Eh of 0.5 volts at pH 5; Brookins 1987). The reactions are:

$$(4)\ U_3O_8 + \tfrac{1}{2}O_2 + 6H^+ <-> 3UO_2^{+2} + 3H_2O$$

$$(5)\ UF_4 + \tfrac{1}{2}O_2 + H_2O <-> UO_2^{+2} + 2H^+ + 4F^-$$

Using the equilibrium constants reported in the EQ3/6 thermodynamic database (Version 7.2; Wolery 1992; Wolery and Daveler 1992) for the above reactions, U_3O_8 will dissolve to yield 0.14 milligrams of uranium per kilogram of water (mg U/kg water) and dissolution of UF_4 yields 42 mg U/kg water. Therefore, the solubility of UF_4 under these conditions (i.e., pH = 5, Eh = 0.5 volts, and UO_2^{+2} is the only uranium species formed) is 300 times greater than U_3O_8. It is important to highlight that the calculation above assumes UO_2^{+2} is the only uranium species formed. In natural groundwater systems, a variety of common ions (e.g., CO_3^{-2}) are available to complex UO_2^{+2}, resulting in increased dissolution of uranium solids. Most of these complexing ions are provided by dissolution reactions between rainwater and soil minerals. This important point is discussed in more detail below.

299 The solubility calculation above predicts that U_3O_8 will remain in the environment much longer than UF_4 if the particle size and emitted quantities (i.e., moles) are similar for each uranium form. As the dissolution rate of a solid is a function of the particle surface area, leaching of very fine U_3O_8 particles can yield uranium concentrations that are similar to those derived from leaching of coarser UF_4 particles – if the leaching time period is less than that required to establish solubility equilibrium. From the example above, note that if the water is allowed to equilibrate with the solids the uranium yield would be 6 orders of magnitude greater for the UF_4 relative to U_3O_8, regardless of particle size.

299 Another point to emphasize from the kinetic perspective is that the instantaneous release of uranium to the glacial till is tied to the rate of dissolution. Particles of UF_4 are likely to release more dissolved uranium to the glacial till than U_3O_8 particles during any given storm event (i.e., the rate of dissolution for UF_4 is greater than U_3O_8), if the mass (i.e., moles) and particle size of each form are similar. Evidence for the greater stability and persistence of uranium oxide particles in the environment (relative to uranium fluoride salts) can be gathered from the literature on uranium ore deposits. There are abundant ore deposits containing various uranium oxide minerals (Nash et al. 1981), but no reported occurrences of uranium fluoride deposits. Additionally, support for rapid dissolution and equilibration of soluble uranium salts can be found in the ORNL study on the solubility measurements of uranium in FEMP contaminated soils (Lee et al. 1993). In this study, two soils were leached to establish uranium solubility concentrations - one soil was obtained from the production area where soluble uranium is present and the other was obtained from the incinerator area where only uranium oxide particles have been released. The production area soil attained a steady uranium concentration of about 10 mg/L within a year, while the incinerator soil continued to increase its uranium concentration through 400 days (U = 4 mg/kg at 400 days). This study and research on uranium ore deposits imply that little, if any, of the UF_4 released from FEMP operations remains in the soil today. However, secondary uranium phases derived from spills of soluble uranium salts may persist in the production area. These secondary phases have moderate solubilities and their importance to the fate and transport of uranium is discussed in Section F.3.I.4.0.

The use of solubility calculations can be extended to all uranium forms believed to have been released from FEMP sources (Section F.3.I.2.0) to develop a leaching hierarchy for uranium minerals. A relative ranking of mineral solubility in rainwater was obtained by computing the saturation indicies for most FEMP uranium minerals of interest. The saturation index (SI) is equal to the log of the ion

001161

activity product (iap) minus the log of the solubility product (sp), or SI = log(iap/sp). An SI value of zero (iap = sp) indicates the mineral is saturated in the solution (i.e., the mineral is at its solubility limit). When SI values are compared among the uranium minerals, minerals with the lowest SI values are most soluble and those with the highest values are least soluble. SI calculations were carried out with the EQ3/6 geochemical computer code (Version 7.2; Wolery 1992; Wolery and Daveler 1992) and results are summarized in Table F.3.I.3-2; results are listed in qualitative categories of most leachable (i.e., most soluble), moderately leachable, and least leachable.

299 Important dissolution reactions for uranium minerals in past and present near-surface sources (Table F.3.I.3-2) are given below:

(6) $UF_6 + 2H_2O <-> UO_2^{+2} + 4H^+ + 6F^-$

(7) $UO_2(NO_3)_2 \cdot 6H_2O + H_2O <-> UO_2^{+2} + 2NO_3^- + 7H_2O$

(8) $UCl_4 + \frac{1}{2}O_2 + H_2O <-> UO_2^{+2} + 2H^+ + 4Cl^-$

(9) $(NH_4)_2U_2O_7 + 3H_2O <-> 2NH_4^+ + 2UO_2^{+2} + 6OH^-$

(10) $NH_4UO_2PO_4 <-> NH_4^+ + UO_2^{+2} + PO_4^{-3}$

(11) $UF_4 + \frac{1}{2}O_2 + H_2O <-> UO_2^{+2} + 2H^+ + 4F^-$

(12) $Na_2U_2O_7 + 3H_2O <-> 2Na^+ + 2UO_2^{+2} + 6OH^-$

(13) $UO_2F_2 <-> UO_2^{+2} + 2F^-$

(14) $UO_2 + \frac{1}{2}O_2 + 2H^+ <-> UO_2^{+2} + H_2O$

(15) $U_3O_8 + \frac{1}{2}O_2 + 6H^+ <-> 3UO_2^{+2} + 3H_2O$

(16) $UO_3 + 2H^+ <-> UO_2^{+2} + H_2O$

299 As Reactions 6 through 13 involve uranium salts of moderate to high solubility (Table F.3.I.3-2), rainwater contacting these solids would result in rapid dissolution and subsequent mobilization of uranium. Because of their soluble nature, the uranium salts in Reactions 6 through 13 are not expected to be present in near-surface sources today due to the high annual rainfall (greater than 40 inches) and the cessation of production activities at the FEMP in 1989.

Under the wet and oxidizing surface soil conditions present at the FEMP, uranium will be leached from near-surface sources and released initially as the uranyl ion (UO_2^{+2}). UO_2^{+2} readily forms aqueous complexes with carbonate (CO_3^{-2}), phosphate (PO_4^{-3}), and hydroxide (OH^-) ions present in porewater and groundwater. The rainwater/soil reactions discussed above produce porewater and

groundwater compositions that reflect equilibrium with carbonate minerals, resulting in waters composed primarily of the ions Ca^{+2}, HCO_3^-, Mg^{+2}, and CO_3^{-2}. The CO_3^{-2} ion has a strong affinity for UO_2^{+2} and readily forms aqueous uranium complexes as follows:

299 (17) $UO_2^{+2} + 2CO_3^- <-> UO_2(CO_3)_2^{-2}$

299 (18) $UO_2^{+2} + 3CO_3^- <-> UO_2(CO_3)_3^{-4}$

Other uranium species that are predicted (based on EQ3/6 geochemical modeling) to exist in FEMP perched groundwater at much lower concentrations are indicated below:

299 (19) $2UO_2^{+2} + CO_3^{-2} + 3OH^- <-> (UO_2)_2CO_3(OH)_3^-$

(20) $UO_2^{+2} + 2OH^- <-> UO_2(OH)_2^o$

(21) $UO_2^{+2} + PO_4^{-3} <-> UO_2PO_4^-$

(22) $UO_2^{+2} + CO_3^{-2} <-> UO_2CO_3^o$

299 The formation of uranium complexes in FEMP porewater and perched groundwater enhances the dissolution of uranium minerals by decreasing the activity (i.e., concentration) of UO_2^{+2} in the water. As the UO_2^{+2} activity is lowered in Reactions 17 through 22 by the formation of the indicated complexes, the affinity to drive Reactions 6 through 16 to the right is increased, resulting in dissolution of additional uranium solids. The principle illustrated here is that formation of aqueous uranium complexes increases the uranium concentration in solution.

299 Another important observation is that the predicted uranium speciation in perched groundwater (Reactions 17 through 22) is dominated by negatively charged complexes, which have greater mobility in most water/soil systems. Most water/soil systems are dominated by particles that have a net negative charge on their surface, creating favorable conditions for the adsorption of positively charged ions (e.g., Cd^{+2}, Ra^{+2}, etc.). The adsorption of negatively charged species is controlled largely by the presence of iron, manganese, and aluminum oxyhydroxide coatings on weathered mineral grains.

298 F.3.I.3.3 Oxidation-Reduction Reactions

Oxidation-reduction reactions involve the transfer of electrons from one element to another. The ability of any soil, groundwater, or other natural environment to carry out an oxidation or reduction process is measured by a quantity called its redox potential or Eh. Eh measurements give insight on

the ability of an environment to supply electrons to an oxidizing agent (reducing environment) or to obtain electrons from a reducing agent (oxidizing environment). For example, uranium metal (a reducing agent) placed in the presence of rainwater at pH = 5 and Eh = 500 millivolts (mV) will give up electrons to the rainwater as the metal is transformed into $UO_3 \bullet 2H_2O$ (schoepite). The transformation occurs in a number of steps that involve the release of electrons from the metal and the use of the electrons by oxygen to form intermediate uranium oxides and eventually schoepite. A simplified redox scenario for this transformation is given in the following reactions:

(23) $U <-> U^{+4} + 4e^-$

(24) $U^{+4} + 4e^- + O_2 <-> UO_2$

(25) $UO_2 <-> UO_2^{+2} + 2e^-$

(26) $UO_2^{+2} + 2e^- + \frac{1}{2}O_2 + 2H_2O <-> UO_3 \bullet 2H_2O$

298 In Reaction 23, four electrons are obtained from the uranium as it it tranformed into the aqueous specie U^{+4}. The products from Reaction 23 are reacted with oxygen in Reaction 24 to form the intermediate amorphous oxide UO_2. Further oxidation of UO_2 produces the uranyl ion and two electrons (Reaction 25), which react with oxygen and water in Reaction 26 to form the final product $UO_3 \bullet 2H_2O$. The above redox example consists of two oxidation steps; however, uranium may occur in several oxidation states in the environment and numerous other oxidation-reduction reactions probably take place in the transformation of uranium metal to schoepite.

298 Uranium has three common oxidation states (+4, +5, +6) in aqueous environments, designated as U(IV), U(V), and U(VI). Important aqueous oxidation-reduction reactions between these three uranium oxidation states are:

(27) $U^{+4} + 2H_2O <-> UO_2^{+} + 4H^+ + e^-$

(28) $U^{+4} + 2H_2O <-> UO_2^{+2} + 4H^+ + 2e^-$

(29) $UO_2^{+} <-> UO_2^{+2} + e^-$

298 In the above reactions, U(IV) is oxidized to U(V) (Reaction 27) or U(VI) (Reaction 28) and U(V) is oxidized to U(VI) (Reaction 29). In glacial overburden background groundwaters having pH of 6.9 to 7.7, the dominant oxidation state is U(VI) when Eh is greater than 50 mV and U(IV) when Eh is less than 50 mV. The U(V) oxidation state is somewhat unstable with respect to the U(VI) and U(IV)

states, and U(V) does not readily occur as the dominant oxidation state in aqueous environments (Brookins 1987). When uranium is in the U(VI) state, it is readily transported as the aqueous uranyl ion (UO_2^{+2}). However, under reducing conditions favorable to the U(IV) oxidation state, uranium is stabilized as the nearly insoluble UO_2 solid. Therefore, uranium is essentially immobile in aqueous environments under reducing conditions (i.e., Eh less than zero).

298 At the FEMP, Eh measurements at four monitoring wells in the glacial overburden (Wells 1012, 1058, 1059, and 1124) ranged from 84 to 485 mV, over a pH range of 6.9 to 7.7. These Eh values correspond to an environment that is transitional between oxidizing and reducing (84 mV) to oxidizing (485 mV). The measured Eh values indicate an aqueous environment that favors the U(VI) oxidation state and, therefore, uranium is expected to be mobile in the glacial overburden. Moreover, as shown in Reactions 17 and 18, uranium mobility is enhanced further when the uranyl ion forms anion complexes with carbonate ion. The speciation and solubility of uranium in glacial overburden groundwaters of variable pH, Eh, and composition are discussed further in Section F.3.I.3.5.

298 F.3.I.3.4 <u>ADSORPTION AND ION-EXCHANGE REACTIONS</u>

As the redox potential of glacial overburden groundwater and the speciation of uranium into carbonate complexes enhances the solubility of uranium solids, it is unlikely that precipitation of uranium solids from perched groundwater ($HCO_3^- = 470$ mg/L) will occur at observed uranium concentrations below about 1 mg/L (as discussed in Section F.3.I.3.5). Therefore, the most important processes affecting the migration of uranium in glacial overburden media are adsorption and ion-exchange reactions with the surfaces of soil particles. Examples of these reactions for $UO_2(CO_3)_2^{-2}$ are given below:

298 (30) $\text{site}^{+2} + UO_2(CO_3)_2^{-2} <-> \text{site-}UO_2(CO_3)_2$

(31) $\text{site-}CO_3 + UO_2(CO_3)_2^{-2} <-> \text{site-}UO_2(CO_3)_2 + CO_3^{-2}$

322 Adsorption (Reaction 31) refers to two distinct processes: physical adsorption and chemisorption
298 (Lasaga 1981). Physical adsorption results from the intermolecular or van der Waal's forces acting between the particle surface and ion. This is the initial step in removing the ion from solution. Chemisorption involves the formation of chemical or ionic bonds between the surface atoms and the adsorbed species. Although physical adsorption occurs rapidly, chemisorption is slow and requires that the physically adsorbed specie "age" on the site to allow time for the bonding reaction to take

place. Once chemisorption has occurred, it is very difficult to desorb the specie from the solid. Therefore, adsorption/desorption reactions become irreversible with time (i.e., only a fraction of what is initially adsorbed to the solid can be removed or extracted by desorption), which is in contrast to the fully reversible assumption invoked in fate and transport models by the use of the solid/liquid partition coefficient (i.e., K_d). Evidence for the irreversible nature of adsorption on the time frame of several decades is provided by adsorption and desorption batch tests with FEMP soil. The test results show mean values of 24 L/kg for adsorption and 270 L/kg for desorption. These studies and the use of adsorption and desorption values in fate and transport modeling, via the K_d approach, is discussed in Section F.3.I.5.0.

298 Ion exchange (Reaction 31) is physical adsorption that is accompanied by desorption of a different specie. The exchangeability of an adsorbed ion depends on how it is attached to the soil particle; i.e., physical adsorption versus chemisorption. Species physically adsorbed to the soil particle surface are readily exchanged, while chemisorbed particles are more commonly exchanged only when they are on the corners or edges of particle fragments. In this paper, the term adsorption is used in a generic sense to include all processes in the continuum of physical adsorption, chemisorption, and ion exchange.

Adsorption of negatively charged uranyl carbonate species can take place on mineral surfaces that have a pH zero point of charge (pH_{zpc}) above the water/soil system pH. The pH_{zpc} is the pH at which the net charge on a mineral's surface is zero. When the pH of the water/soil system is below the mineral's pH_{zpc}, there is a net positive charge on its surface and the mineral has an affinity for negatively charged species. At the FEMP, the pH of perched groundwaters is generally near 7.5. Therefore, minerals with a pH_{zpc} above 7.5 will contain potential adsorption sites for negatively charged uranyl carbonate species. Minerals present in the glacial overburden that fit this description are summarized in Table F.3.I.3-3, along with the pH_{zpc} reported by Stumm and Morgan (1981) for oxide and hydroxide minerals and values calculated by the EQ3/6 geochemical code for calcite and dolomite.

323 The most important oxide and hydroxide surfaces are found on minerals containing aluminum and iron (Table F.3.I.3-3). Weathering of feldspar and amphibole minerals (Table F.3.I.3-1) to clay minerals can produce the oxide and hydroxide phases noted in Table F.3.I.3-3. Additionally, clay minerals (illite, corrensite, chlorite, and iron oxyhdroxide minerals in Table F.3.I.3-1) can provide

the aluminum and iron oxyhydroxide surfaces to catalyze the adsorption reactions. A discussion on the mass of uranium available for sorption reactions will be presented as part of the Operable Unit 5 FS Report in November, 1994.

323 For the carbonate minerals present in the glacial overburden (Table F.3.I.3-1), the pH_{zpc} is dependent on the partial pressure of CO_2 (Table F.3.I.3-3). Rainwater equilibrated with air ($P_{CO2} = 10^{-3.5}$) has a lower CO_2 partial pressure than soil containing organic material and microorganisms. Measurements of the composition of gas samples from soil generally show CO_2 partial pressures from 10^{-3} to 10^{-1} (Freeze and Cherry 1979). The higher CO_2 partial pressure in soil atmosphere drives Reaction 2 to the right to produce more H_2CO_3. Dissociation of the additional H_2CO_3 leads to higher concentrations of HCO_3^- and H^+, which lowers a carbonate minerals pH_{zpc} (Stumm and Morgan 1981). In Table F.3.I.3-3, the pH_{zpc} for calcite drops from 8.4 to 7.6 as P_{CO2} is raised from $10^{-3.5}$ to $10^{-2.5}$. This implies that the carbonate minerals in the glacial overburden will not be very efficient at adsorption of uranyl carbonate species, and this is reflected in the low adsorption values selected for the fate and transport model. Specific adsorption values used to model uranium migration in the glacial overburden are discussed in Section F.3.I.5.0.

298 F.3.I.3.5 URANIUM MINERAL SOLUBILITY IN PERCHED GROUNDWATER

325 The concentration of uranium in glacial overburden groundwater will be controlled by the dissolution rates of uranium solids in the soil, the adsorption of uranium onto glacial till solids, the solubility of uranium minerals in perched groundwater, and hydraulic factors such as flow rates, flow volumes, and residence times (hydraulic factors are discussed in detail in Section 3.6). Observed uranium concentrations in glacial overburden groundwater at the FEMP range from 0.00029 to 129 mg/L (Table E.1-1;) Using groundwater constituent concentrations for Monitoring Wells 1060 (pH 7.67) and 1065 (pH 6.97) (Appendix I) and a uranium concentration of 129 mg/L, mineral SIs were calculated at Eh values of 84 and 485 mV to evaluate the saturation state of uranium phases over the range of pH and Eh conditions found in glacial overburden groundwater (Tables F.3.I.3-4 and F.3.I.3-5).

325 In groundwater obtained from Monitoring Wells 1060 (pH = 7.67, UO_2^{+2} = 146 mg/L) and 1065 (pH = 6.97, UO_2^{+2} = 146 mg/L), nine uranium phases are predicted to be supersaturated (SI > 0.4) or saturated (0.4 > SI > -0.4) at an Eh of 84 mV, but only four phases at an Eh of 485 mV (Tables F.3.I.3-4 and F.3.I.3-5, respectively). At an Eh of 84 mV, haiweeite, soddyite, U_3O_7,

001167

U_3O_8, U_4O_9, and uraninite are supersaturated in groundwater from both wells, $CaUO_4$ and coffinite are respectively supersaturated in groundwater from Wells 1060 and 1065, coffinite and sklodowskite are saturated in groundwater from Well 1060, and $(UO_2)_3(PO_4)_2 \cdot 4H_2O$ and schoepite are saturated in groundwater from Well 1065. Note that the SI values for minerals containing uranium in the U(VI) oxidation state do not change as a function of Eh, indicating U(VI) is the stable oxidation state over the Eh range of 84 to 485 mV. However, the uranium oxides containing uranium in the U(IV) and U(V) oxidation states are thermodynamically unstable at an Eh value of 485 mV, and their SI values decrease to less than -10 (indicating they will not precipitate in the glacial overburden under this Eh condition). However, these thermodynamic calculations do not consider dissolution kinetics, and although the U(IV) and U(V) oxidation states are thermodynamically unstable at an Eh value of 485 mV, minerals with U(IV) and U(V) that are currently present in the environment may persist for decades to thousands of years if the dissolution kinetics are slow (e.g., UO_2). Additionally, groundwater flow volumes and residence times will affect the degree to which uranium solids are dissolved. Lacking kinetic data on the dissolution rates of the uranium phases, all that can be said is that the observed uranium concentrations in glacial overburden groundwater show that residence times are great enough to achieve concentrations that can saturate a number of uranium phases.

325 It is of interest that the elements comprising the supersaturated and saturated uranium phases listed above (i.e., Si, P, Ca, Mg, O) have all been detected in uranium grains found in contaminated FEMP soil (Lee and Marsh 1992), although specific minerals could not be identified by this ORNL study because the SEM and EDX analysis did not yield stoichiometric information. However, the thermodynamic solubility calculations and ORNL elemental data suggest that the predicted saturated phases can be present in FEMP soil.

325 Assuming precipitation kinetics allow any of the supersaturated and saturated phases to form at ambient temperature over the time frame of FEMP operations (e.g., decades), it is useful to identify the minimum uranium concentration required to precipitate a given mineral (i.e., the uranium concentration that will set a mineral SI equal to zero). These concentrations have been calculated for the supersaturated and saturated phases in Tables F.3.1.3-4 and F.3.1.3-5 at an Eh of 84 mV (Table F.3.1.3-6). Note that the presented concentrations cover the range of observed uranium concentrations in glacial overburden groundwaters, indicating groundwater residence times are great enough to achieve saturation with respect to the indicated phases.

325 For the uranium minerals in Table F.3.I.3-6 containing the U(IV) and U(V) oxidation states (β-U_3O_7, U_3O_8, U_4O_9, UO_2, and $USiO_4$), higher uranium concentrations are required to saturate these phases in groundwater from Well 1060. This is primarily due to a partial pressure of oxygen (P_{O2}) that is about three orders of magnitude higher in groundwater from Well 1060. Higher P_{O2} destablizes the U(IV) and U(V) oxidation states, which increases the solubility of the indicated minerals. The higher P_{O2} in groundwater from Well 1060, relative to Well 1065, is due to a higher pH value - as P_{O2} is a function of pH at constant Eh (i.e., 84 mV). Variation in the uranium concentrations required to saturate minerals containing uranium in the U(VI) oxidation state is largely due to the difference in pH and element concentrations (e.g., Ca, P, Si, Mg) in the groundwater from the two wells. Although any one or several of the phases in Table F.3.I.3-6 may precipitate from either groundwater when the observed maximum uranium concentration has the lowest observed Eh value, it is important to note that the minerals containing U(IV) and U(V) will not precipitate when the P_{O2} exceeds 10^{-44} atmospheres (about 200 mV at pH 6.97). Therefore, under most Eh and pH conditions measured in glacial overburden groundwater, the precipitation of secondary uranium phases is expected to be limited to minerals containing the U(VI) oxidation state.

It is important to emphasize that mineral solubility is only one of several geochemical processes that may control uranium concentrations in perched groundwater. Table F.3.I.3-6 indicates that uranium concentrations in groundwater have to be on the order of 0.2 mg/L (at pH = 6.97, Eh = 84 V) the least soluable uranium phase will precipitate. Therefore, if the soluble uranium phases in the source have been removed by leaching, future uranium concentrations in groundwater may never reach saturation with respect to the other uranium solids. Under this future scenario, the uranium concentration in perched groundwater will be controlled by dissolution rates in the source and adsorption reactions in the soil. This scenario is hypothesized to be the most probable case for present sources of uranium oxide particles derived from air emissions, while mineral solubility may control some uranium concentrations observed in present groundwater contaminated by past spills of uranyl nitrate and other uranium solutions.

298 F.3.I.3.6 <u>SUMMARY</u>

Uranium will be mobilized in source areas by rainwater leaching and aqueous complexation of the uranyl ion with carbonate ion. Leaching in the source takes place by dissolution of uranium solids and desorption of uranium from soil particles. As the mobilized uranium migrates away from the source, the plume encounters lower portions of the glacial overburden where adsorption of uranium

and/or precipitation of uranium may occur. Precipitation of uranium will be controlled primarily by the concentration of carbonate ion, with waters having higher aqueous carbonate concentrations suppressing uranium precipitation by formation of uranyl carbonate complexes.

326 Finally, it is important to highlight the contrast between the heterogeneous uranium forms in the source area and the homogeneous uranium forms in the water/glacial overburden system. The heterogeneity of uranium forms in the different source areas results in a wide range of release concentrations to porewater and groundwater (Table F.3.I.3-2 and Reactions 6 through 14). However, once the uranium has been released to the porewater and groundwater, the uranium is homogenized throughout the FEMP area as uranyl carbonate species (Reactions 17 and 18), with the exception of secondary uranium precipitates that may form (e.g., $CaUO_4$, $(UO_2)_3(PO_4)_2 \cdot 4H_2O$). If present, the secondary precipitates will influence the uranium groundwater concentrations at some future date, although mass balance information is not available to estimate the amount of uranium that may be tied up in these secondary precipitates. This conceptual picture is important to recall throughout the discussion presented in Sections F.3.I.4.0 and F.3.I.5.0.

TABLE F.3.I.3-1

MINERALOGICAL SUMMARY OF FEMP GLACIAL OVERBURDEN SOIL

Phase/Ideal Formula	Modal Percent[a]
Calcite $CaCO_3$	25.75 ± 11.62
Dolomite $MgCa(CO_3)_2$	20.77 ±10.53
Quartz SiO_2	18.03 ± 8.58
Feldspar $KAlSiO_3$	14.76 ± 6.49
Illite $KAl_5Si_7O_{20}(OH)_4$	9.15 ± 17.37
Corrensite $NaCaMg_8Fe_5Al_5Si_{14}O_{40}(OH)_{20}$	4.27 ± 8.30
Organic debris (humus)	3.49 ± 3.68
Chlorite $Mg_7Fe_4Al_2Si_7O_{20}(OH)_{16}$	1.13 ± 1.50
Amphibole $KCa_2Mg_2Fe_2Al_2Si_6O_{20}(OH)_4$	0.95 ± 0.72
Iron oxyhydroxide minerals $Fe(OH)_3$, $FeOOH$, Fe_2O_3	0.83 ± 0.72

[a]Average and standard deviation of 20 soil samples analyzed by McCrone Associates, Inc. (1992). Modal percent is based on the mineral area exposed on a thin section prepared for microscopic examination.

299

TABLE F.3.I.3-2

LEACHABILITY OF FEMP URANIUM SOLIDS IN RAINWATER AT 25°C

Most Leachable (SI[a])	Moderately Leachable (SI)	Least Leachable (SI)
UF_6 (−90.0)	UF_4 (−36.6)	UO_2 (−11.8)
$UO_2(NO_3)_2 \cdot 6H_2O$ (−78.7)	$Na_2U_2O_7$ (−20.1)	U_3O_8 (−11.1)
UCl_4 (-76.0)	UO_2F_2 (-16.1)	UO_3 (−7.43)
$NH_4UO_2PO_4$[b]		
$(NH_4)_2U_2O_7$[b]		

[a] Saturation Index (SI) calculated with the EQ3/6 geochemical code using pH = 5, Eh = 0.5 Volts (P_{O2} = 5.1 x 10^{-30} atm), and U = 0.001 mg/L. Lowest SI values correspond to most soluble, or leachable, uranium forms.
[b] Mineral is not in EQ3/6 thermodynamic database; therefore, SI is unavailable. Ammonium salts are generally very soluble, and this assumption is used to support the placement of these minerals in the most leachable category.

323

TABLE F.3.I.3-3

GLACIAL OVERBURDEN MINERALS WITH pH_{zpc} GREATER THAN 7.5[a]

Mineral	pH_{zpc}
Calcite $CaCO_3$	8.4[b] (7.6[c])
Dolomite $MgCa(CO3)_2$	8.3[b] (7.5[c])
Aluminum oxide $\alpha-Al_2O_3$	9.1
Aluminum oxyhydroxide $\gamma-AlOOH$	8.2
Iron oxyhydroxide $\alpha-FeOOH$	7.8
Amorphous iron hydroxide $Fe(OH)_3$	8.5

[a]Oxide and hydroxide minerals compiled from Stumm and Morgan (1981).
[b]pH_{zpc} calculated with EQ3/6 geochemical code for $P_{CO2} = 10^{-3.5}$.
[c]pH_{zpc} calculated with EQ3/6 geochemical code for $P_{CO2} = 10^{-2.5}$.

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TABLE F.3.1.3-4

SATURATION INDICIES FOR URANIUM MINERALS IN PERCHED GROUNDWATER FROM WELL 1060[a] (pH = 7.67)

Mineral Formula (name)	SI[b] Eh = 84 mV P_{O2} = 2.5×10^{-50} atm	SI[b] Eh = 485 mV P_{O2} = 2.9×10^{-22} atm
$Ca(UO_2)_2(Si_2O_5)_3 \cdot 5H_2O$ (haiweeite)	5.417	5.417
$(UO_2)_2SiO_4 \cdot 2H_2O$ (soddyite)	5.067	5.067
β-U_3O_7	2.209	--[c]
U_3O_8	1.199	--
U_4O_9	1.134	--
UO_2 (uraninite)	0.484	--
$CaUO_4$	0.429	0.429
$USiO_4$ (coffinite)	-0.024	--
$Mg(H_3O)_2(UO_2)_2(SiO_4)_2 \cdot 4H_2O$ (sklodowskite)	-0.058	-0.058
$UO_3 \cdot 2H_2O$ (schoepite)	-0.456	-0.456
β-$UO_2(OH)_2$	-0.606	-0.606
α-$UO_3 \cdot 0.9H_2O$	-0.675	-0.675
UO_2CO_3 (rutherfordine)	-1.389	-1.389
$(UO_2)_3(PO_4)_2 \cdot 4H_2O$	-2.042	-2.042
$Mg(UO_2)_2(PO_4)_2$ (saleeite)	-2.502	-2.502
$Ca(UO_2)_2[SiO_3(OH)]_2 \cdot 5H_2O$ (uranophane)	-3.255	-3.255
γ-UO_3	-3.514	-3.514
$UO_2HPO_4 \cdot 4H_2O$	-3.631	-3.631
UO_2 (amorphous)	-3.984	--
UO_2HPO_4	-4.067	-4.067
β-UO_3	-4.138	-4.138
α-UO_3	-4.484	-4.484
$CaU(PO_4)_2 \cdot 2H_2O$ (ningyoite)	-4.670	--
UPO_5	-4.681	--
$UO_2FOH \cdot 2H_2O$	-5.003	-5.003

TABLE F.3.I.3-4
(Continued)

Mineral Formula (name)	SI[b] Eh = 84 mV $P_{O2} = 2.5x10^{-50}$ atm	SI[b] Eh = 485 mV $P_{O2} = 2.9x10^{-22}$ atm
$Na_2U_2O_7$	-5.162	-5.162
$UO_2FOH \cdot H_2O$	-5.436	-5.436
UO_2FOH	-5.936	-5.936
$UOFOH \cdot 0.5H_2O$	-7.104	--
$NaUO_3$	-7.159	--
$MgUO_4$	-7.341	-7.341
$U_5O_{12}Cl$	-7.442	--

[a] Using average groundwater concentration for Well 1060.
[b] Saturation Index (SI) calculated with EQ3/6 geochemical code (Version 7.2) for UO_2^{+2} = 146 mg/L.
[c] -- means SI $\leq$ -10.

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TABLE F.3.I.3-5

SATURATION INDICIES FOR URANIUM MINERALS IN PERCHED GROUNDWATER FOR WELL 1065[a] (pH = 6.97)

	SI[b]	
Mineral Formula (name)	Eh = 84 mV P_{O2} = 4.4x10^{-53} atm	Eh = 485 mV P_{O2} = 5.0x10^{-25} atm
$(UO_2)_2SiO_4 \cdot 2H_2O$ (soddyite)	5.286	5.286
β-U_3O_7	4.380	--[c]
$Ca(UO_2)_2(Si_2O_5)_3 \cdot 5H_2O$ (haiweeite)	3.702	3.702
U_3O_8	2.449	-6.902
U_4O_9	2.334	--
UO_2 (uraninite)	2.029	--
$USiO_4$ (coffinite)	1.410	--
$(UO_2)_3(PO_4)_2 \cdot 4H_2O$	0.203	0.203
$UO_3 \cdot 2H_2O$ (schoepite)	-0.291	-0.291
β-$UO_2(OH)_2$	-0.441	-0.441
UO_2CO_3 (rutherfordine)	-0.516	-0.516
α-$UO_3 \cdot 0.9H_2O$	-0.510	-0.510
$CaUO_4$	-0.781	-0.781
$Mg(H_3O)_2(UO_2)_2(SiO_4)_2 \cdot 4H_2O$ (sklodowskite)	-1.306	-1.306
$Mg(UO_2)_2(PO_4)_2$ (saleeite)	-1.777	-1.777
UO_2 (amorphous)	-2.439	--
$UO_2HPO_4 \cdot 4H_2O$	-2.591	-2.591
$CaU(PO_4)_2 \cdot 2H_2O$ (ningyoite)	-2.751	--
UPO_5	-2.951	--
UO_2HPO_4	-3.028	-3.028
$U_5O_{12}Cl$	-3.093	--
γ-UO_3	-3.349	-3.349
β-UO_3	-3.973	-3.973
α-UO_3	-4.319	-4.319
$UO_2FOH \cdot 2H_2O$	-4.328	-4.328

TABLE F.3.I.3-5
(Continued)

Mineral Formula (name)	SI[b] Eh = 84 mV P_{O2} = 4.4×10^{-53} atm	SI[b] Eh = 485 mV P_{O2} = 5.0×10^{-25} atm
$Ca(UO_2)_2[SiO_3(OH)]_2 \cdot 5H_2O$ (uranophane)	-4.524	-4.523
$UO_2FOH \cdot H_2O$	-4.761	-4.761
$UOFOH \cdot 0.5H_2O$	-5.049	--
UO_2FOH	-5.262	-5.262
UOFOH	-5.542	--
$H_2(UO_2)_2(PO_4)_2$ (H-autunite)	-6.252	-6.252
$UO_2SO_4 \cdot H_2O$	-6.599	-6.599
$Na_2U_2O_7$	-6.976	-6.975
$UOF_2 \cdot H_2O$	-7.222	--
$NaUO_3$	-7.376	--

[a] Using average groundwater concentration for Well 1065.
[b] Saturation Index (SI) calculated with EQ3/6 geochemical code (Version 7.2) for UO_2^{+2} = 146 mg/L.
[c] -- means SI $\leq$ -10.

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TABLE F.3.I.3-6

URANIUM CONCENTRATIONS REQUIRED TO SATURATE[a] SELECT URANIUM PHASES IN PERCHED GROUNDWATER FROM WELLS 1060 AND 1065

	Uranium Concentration (mg/L)	
Mineral Formula (name)	1060	1065
$(UO_2)_2SiO_4 \cdot 2H_2O$ (soddyite)	0.49	0.19
β-U_3O_7	13.4	0.53
$Ca(UO_2)_2(Si_2O_5)_3 \cdot 5H_2O$ (haiweeite)	0.32	1.16
U_3O_8	38.9	5.08
U_4O_9	12.6	0.38
UO_2 (uraninite)	51.8	0.77
$USiO_4$ (coffinite)	145	3.28
$(UO_2)_3(PO_4)_2 \cdot 4H_2O$	700	102
$UO_3 \cdot 2H_2O$ (schoepite)	349	318
$CaUO_4$	53.7	1338
$Mg(H_3O)_2(UO_2)_2(SiO_4)_2 \cdot 4H_2O$ (sklodowskite)	137	958

[a] Saturate means SI = 0 for $P_{O2} = 2.5 \times 10^{-50}$ atm (Eh = 84 mV) at pH = 7.67 (Well 1060), and $P_{O2} = 4.4 \times 10^{-53}$ atm (Eh = 84 mV) at pH = 6.97 (Well 1065).

F.3.I.4.0 DISTRIBUTION OF URANIUM IN THE GLACIAL OVERBURDEN

F.3.I.4.1 INTRODUCTION

Past releases of uranium from the FEMP occurred in two ways: spills from the handling of uranium solutions in Plants 2/3, 6, and 8 (estimated to be 1,300 kg of uranium; RAC 1994); and air emissions from the pilot plant and Plants 1, 2/3, 4, 5, and 8 (estimated to be 179,000 kg of uranium; Table F.3.I.2-2). Accidental spills resulted in concentrated, mobile point sources in the form of uranyl nitrate, ammonium uranyl, and other uranium solutions, while air emissions led to site-wide deposition of uranium fluoride and oxide solids. The leachability, and hence mobility, of uranium solids processed at the FEMP is summarized and discussed in Table F.3.I.3-2 and Section F.3.I.3.0.

Discussed in this section is the past, present, and future uranium distribution in the glacial overburden based on the uranium solids given in Table F.3.I.3-2 and the aqueous uranium forms discussed in Section F.3.I.2.0. The temporal distribution will be discussed with respect to releases in the production area (i.e., aqueous spills and air emissions) and those areas outside of the production area, Operable Units 1, 2, and 4 (i.e., air emissions only).

F.3.I.4.2 INITIAL URANIUM DISTRIBUTION AT TIME OF RELEASE

326 Figure F.3.I.4-1a is a schematic cross section of FEMP glacial overburden showing a conceptual view of the initial uranium distribution in the production area. Although the release events occurred over a 30-year period (1955 to 1985), the conceptual view in Figure F.3.I.4-1a depicts all releases as occurring simultaneously at some time in the past. In the illustrated scenario on Figure F.3.I.4-1a, aqueous acid spills released mobile forms of uranium that immediately began to percolate into and react with the glacial overburden. If uranium concentrations in the aqueous spills exceeded mineral solubilities after reactions with glacial overburden, precipitation of $(UO_2)_3(PO_4)_2 \cdot 4H_2O$, $CaUO_4$, $Mg(UO_2)_2(PO_4)_2$, $UO_3 \cdot 2H_2O$, and/or other uranium solids may have occurred (see Tables F.3.I.3-4, F.3.I.3-5 and F.3.I.3-6 in Section F.3.I.3.5). The initial distribution of solids released by air emissions is restricted to the top 18 inches of the soil.

Figure F.3.I.4-2a illustrates the initial conditions for uranium release in areas outside of the production area. In these areas, aqueous forms of uranium are absent during the initial deposition, as

uranium is deposited as particles derived from air emissions. The more soluble form of these uranium particles (e.g., UF_6) is rapidly dissolved upon the first storm event.

327 Other operable unit mass loadings and geochemical concepts related to nonairborne releases (leachate) have been accounted for in the Operable Unit 5 fate and transport model by directly including mass loading terms determined in previous RI fate and transport models. These mass loadings were simulated for 40 years in the Operable Unit 5 model and terminated as remedial actions are completed in other operable units. This approach is explained in Section 5.1.1 and F.3.4. The K-65 slurry trench was also included in the Operable Unit 5 RI (Source Area 570b).

F.3.I.4.3 URANIUM DISTRIBUTION AT THE PRESENT TIME

326 The present-day scenario under the production area is conceptualized in Figure F.3.I.4-1b, which shows uranium distributed throughout most of the glacial overburden. Soluble uranium forms have been removed by leaching, leaving the less soluble U_3O_8, UO_2, and UO_3. The primary uranium phases may be mixed with alteration products like $UO_3 \cdot 2H_2O$ and precipitates of $CaUO_4$ and $(UO_2)_3(PO_4)_2 \cdot 4H_2O$ throughout the upper portion of the brown glacial overburden. The uranium plume generated from the dissolution of soluble $UO_2(NO_3)_2 \cdot 6H_2O$, UF_6, UF_4, and $Na_2U_2O_7$ particles commingles with the plume derived from spills of aqueous uranium solutions. Principal aqueous species in the migrating plumes are predicted to be $UO_2(CO_3)_2^{-2}$ and $UO_2(CO_3)_3^{-4}$, with minor formation of $(UO_2)_2CO_3(OH)_3^-$, $UO_2(OH)_2^o$, and $UO_2PO_4^-$. Adsorption of uranium on soil particles may be accompanied by precipitation of the uranium solids listed in Table F.3.I.3-6. Site-specific data supporting this conceptual scenario are presented after discussing the uranium distribution in areas outside of the production area.

326 Figure F.3.I.4-2b summarizes the present conceptual model for uranium distribution in areas impacted solely by uranium particles derived from past atmospheric releases. The uranium plume generated from the dissolution of soluble UF_6, UF_4, and $Na_2U_2O_7$ particles has reached the lower section of the glacial overburden in some areas. Principal aqueous species in the migrating plume are predicted to be $UO_2(CO_3)_2^{-2}$ and $UO_2(CO_3)_3^{-4}$, with minor formation of $(UO_2)_2CO_3(OH)_3^-$, $UO_2(OH)_2^o$, and $UO_2PO_4^-$. Adsorption of uranium on soil particles may be accompanied by precipitation of the uranium solids listed in Table F.3.I.3-6, if a large mass of soluble uranium particles was present initially. Site-specific data supporting this conceptual scenario are presented below.

Across most of the FEMP site, the released uranium is concentrated in the upper 1.5 feet of the glacial overburden and may reach uranium concentrations of greater than 1000 mg/kg of soil (Plates D-10 through D-19; see Plates in DOE, 1994). The uranium forms in the upper 15 feet of weathered and fractured soil are expected to be dominated by the less soluble oxides U_3O_8, UO_2, and UO_3, possibly mixed with precipitates of $CaUO_4$ and $(UO_2)_3(PO_4)_2 \cdot 4H_2O$. $CaUO_4$ and $(UO_2)_3(PO_4)_2 \cdot 4H_2O$ are predicted to be present based on EQ3/6 modeling results using solution analyses obtained from a 70-day leach of surface soil contaminated with uranium oxide particles (Lee et al. 1993). Much of the uranium in the upper 15 feet of the glacial overburden may have been distributed by mechanical processes after deposition. For example, air emission particles that have been reworked into the upper portion of the glacial overburden by construction activities are transported into fractures by percolating rainwater. However, neutralization of acidic uranyl nitrate spills by carbonate minerals may have produced local areas of intense uranium precipitation in the upper few feet of soil. The persistence of these areas through time is dependent on the solubility of the precipitated solid and the volume of percolating water that contacts the precipitate.

326 Analytical data collected on subsurface soil samples indicate that uranium is distributed throughout the glacial overburden to a depth of 20 feet in the general area surrounding the pilot plant, Plant 2/3, and Plants 6 and 9 (Plates D-10 through D-19). Uranium concentrations in the 15- to 20-foot interval of unfractured gray glacial till reach values greater than 100 mg/kg. The presence of uranium in this interval implies geochemical, rather than mechanical processes are responsible for the distribution. Aqueous spills, rainwater dissolution of $UO_2(NO_3)_2 \cdot 6H_2O$, UF_6, UF_4, and $Na_2U_2O_7$ particles, and reactions with carbonate minerals in the glacial overburden mobilize the uranium primarily as the aqueous species $UO_2(CO_3)_2^{-2}$, $UO_2(CO_3)_3^{-4}$, and to a lesser extent as $(UO_2)_2CO_3(OH)_3^-$, $UO_2(OH)_2^o$, and $UO_2PO_4^-$. Percolating rainwater transports the species into the subsurface where adsorption and possibly precipitation occur to redistribute the uranium in the subsurface soil. Solids predicted to precipitate in the subsurface include the minerals listed in Table F.3.I.3-6.

326 As noted in Section F.3.I.3.0, uranium concentrations range from 0.00029 to 129 mg/L in groundwater perched within the glacial overburden. Groundwater or porewater containing high uranium concentrations will partition some of the uranium into and onto the soil by precipitation and adsorption processes. The maximum observed uranium concentration (129 mg/L) is sufficient to saturate a number of uranium phases (Table F.3.I.3-6) in perched groundwater having high bicarbonate activity, implying some of the saturated phases may be present in the glacial overburden.

Scanning electron microscope work conducted on FEMP soil by Oak Ridge National Laboratory (ORNL) noted the association of calcium, phosphorous, silicon and magnesium with uranium particles (Lee and Marsh 1992), supporting the presence of the listed uranium phases (Table F.3.I.3-6) in the soil.

328 Lysimeters placed near the base of the unweathered glacial overburden recovered fluid samples with uranium concentrations that varied from 0.002 to 0.052 mg/L. The lysimeters are installed at three different locations (Figure 3-37). At each of the three locations one lysimeter is installed in the base of the gray clay and one is installed in the upper unsaturated portion of the Great Miami Aquifer, immediately below the base of the gray clay.

328 Lysimeters 11234 and 11129 are located a few hundred feet northwest of the inactive flyash pile. The lysimeter cup in 11234 is located 13.6 feet below the ground surface in approximately 10 feet of gray clay. The lysimeter cup in 11129 is located beneath 11234, approximately 21.6 feet below the ground surface, in the unsaturated portion of the Great Miami Aquifer.

328 Lysimeters 11130 and 11131 are located approximately 1000 feet southeast of the southeast corner of the east parking lot. The lysimeter cup in 11130 is located 21.5 feet below the ground surface in approximately 20 feet of gray clay. The lysimeter cup in 11131 is located beneath 11130, approximately 35.6 feet below the ground surface, in the unsaturated portion of the Great Miami Aquifer.

328 Lysimeters 11132 and 11133 are located just northeast of the northeast corner of the former production area. The lysimeter cup in 11132 is located 25.6 feet below the ground surface in approximately 30 feet of gray clay. The lysimeter cup in 11133 is located beneath 11132, approximately 47.6 feet below the ground surface, in the unsaturated portion of the Great Miami Aquifer.

330 Sampling results for the lysimeters are presented in Table 3-19, results are also discussed in Section
328 4.7. Sampling information indicates uranium mobilized on the surface of the glacial overburden is capable of infiltrating to the base of the glacial overburden in less than 40 years. Major ions in the porewater have concentrations similar to perched groundwater, but pH, silica, and phosphate measurements are unavailable. Using major ion analyses of the porewater from Boring 11133, a

uranium concentration of 0.052 mg/L, and silica and phosphate analyses from perched groundwater, mineral saturation in the pore fluid was evaluated at a pH of 7.2 (based on the pH for calcite saturation in the porewater). Results of the EQ3/6 run indicate all uranium minerals are undersaturated in the porewater. This implies that the uranium distribution in soil at the base of the unweathered glacial overburden (i.e., in excess of background) is controlled by adsorption.

F.3.I.4.4 URANIUM DISTRIBUTION AT SOME FUTURE TIME

Most of the present source of U_3O_8, UO_2, and $UO_3 \cdot 2H_2O$, and possibly $CaUO_4$ and $(UO_2)_3(PO_4)_2 \cdot 4H_2O$, in the upper 1.5 feet of glacial overburden will be remediated through soil washing and/or removed for solidification. Therefore, the future distribution of uranium in the glacial overburden will be controlled by desorption of physically adsorbed uranium and dissolution of $(UO_2)_3(PO_4)_2 \cdot 4H_2O$, $Mg(UO_2)_2(PO_4)_2$, $CaUO_4$, $UO_3 \cdot 2H_2O$, and/or other uranium particles in the subsurface. This scenario is depicted in Figures F.3.I.4-1c and F.3.I.4-2c. Semiquantification of this future uranium distribution is addressed in the remaining discussion of this section.

330 Based on a hypothetical Operable Unit 5 FS clean-up level of 50 mg U/kg soil, future uranium concentrations in subsurface soil will be less than or equal to 50 mg/kg. If the uranium is assumed to be physically adsorbed, then bounds can be placed on the future concentration of uranium in glacial overburden porewater and groundwater by using the calculated adsorption/desorption values for the 15- to 20-foot depth of glacial overburden (Wells 1348, 1354, 1360, 1266, 1317, 1341, 1225, 1230, and 1250 in Table F.3.II.3-3 of Attachment F.3.II). The lowest and highest adsorption/desorption values for the indicated well locations are 12 and 2433 L/kg, yielding respective uranium concentrations of 4.1 and 0.02 mg/L in groundwater equilibrated with a soil containing 50 mg of adsorbed U/kg soil (i.e., 50 mg/kg ÷ 12 L/kg and 50 mg/kg ÷ 2344 L/kg). It should be noted that these predicted groundwater concentrations exceed or equal the proposed maximum concentration level (MCL) of 0.02 mg/L. However, these calculations are for illustrative purposes only and are not intended to serve as the soil or groundwater concentrations that will be evaluated in the Operable Unit 5 FS.

330 As noted in Section F.3.I.3.0, desorption of adsorbed uranium will depend on the extent of chemisorption, with the expectation that with time desorption values will be higher than adsorption values as uranium is retained or incorporated into the solid by chemisorption (which is evident in the 75 to 2433 L/kg range of values reported in Table F.3.II.3-3. Therefore, a groundwater MCL of

0.02 mg/L for uranium can be achieved if the soil contains less than 50 mg of adsorbed U/kg and the K_d for desorption is greater than 2400 L/kg.

330 For particulate uranium that remains in FEMP soil after remediation efforts are completed, useful information can be extracted from the ORNL leaching study (Lee et al. 1993) to estimate the fraction of uranium leached and released during a three day storm event. A conclusion from the leaching of A-14 and B-16 soil is that 0.1 to 4.5 percent, respectively, of the available uranium may be leached from this soil in three days of leaching (i.e., a large storm event). If FEMP soil of density 1.8 kg/L contains 50 mg of particulate uranium per kg of soil (Operable Unit 5 hypothetical clean-up level) and the porosity is 30 percent, 1 liter of water will contact 3.3 liters of soil – or 297 mg of uranium (i.e., 1.8 kg/L * 3.3 L * 50 mg U/kg). Using the 0.1 and 4.5 percent extractable uranium values from the ORNL study, the calculated uranium solution concentration after three days of leaching is 0.3 and 13 mg/L, respectively. Assuming the uranium forms are similar to the particles present in the ORNL study and using the calculated upper concentration of 13 mg/L, uranium porewater concentrations derived from the leaching of uranium particulates (as indicated by lysimeter data) can exceed the solubility limit of $(UO_2)_2SiO_4 \cdot 2H_2O$, U_3O_7, U_3O_8, U_4O_9, $(UO_2)_3(PO_4)_2 \cdot 4H_2O$, and $Mg(UO_2)_2(PO_4)_2$ at a pH of 7.2 and Eh of 100 mV if bicarbonate concentrations in the porewater remain below 300 mg/L. The effect of bicarbonate concentrations on uranium solubility is addressed in the summary presented below.

F.3.I.4.5 SUMMARY OF URANIUM DISTRIBUTION

330 Dissolution of uranium particles (derived from past releases) and precipitates (derived from leaching
329 of uranium source materials) will occur as undersaturated water percolates through the glacial overburden. The rate of dissolution will be highly variable and depend on the surface area and composition of the solid, the pH, Eh, and composition of the water, and the resident time of the water (i.e., the infiltration rate). As water percolates from the surface to greater depths, total dissolved solids increase and the concentration of individual ions can have a significant effect on uranium concentrations (e.g., HCO_3^-). For example, distilled water contacted with FEMP soil in the ORNL study simulate the conditions in the surface and near surface soil, perched groundwater analyses represent deeper waters in the water/soil system, and lysimeter data have solute concentrations between these two end members that serve as an analog of percolating porewater. It is noted here that the groundwater and lysimeter water are saturated with the carbonate minerals calcite and dolomite, and that the distilled water used in the ORNL study becomes saturated with these

carbonate minerals within 300 days. Therefore, solubility equilibrium between rainwater and carbonate minerals will be established within a year, and this equilibria is the most important from the standpoint of uranium mobility. A significant factor influencing the uranium concentration in the water/soil system is the increase in HCO_3^- concentration as water moves from the near surface (121 mg/L, ORNL study), to subsurface (310 mg/L, lysimeter data), to the perched groundwater (> 350 mg/L). The geochemical conditions in each of these three zones is discussed with respect to the future distribution of uranium in the glacial overburden.

330 The ORNL study provides analytical data that can be used to estimate the uranium concentrations that may be attainable if rainwater interacts with surface and near-surface soil containing $(UO_2)_3(PO_4)_2 \cdot 4H_2O$ or $CaUO_4$. Based on the ORNL analytical results after 70 days of leaching, EQ3/6 solubility calculations indicate both solutions are supersaturated with the uranium silicate phases haweeite and soddyite and saturated with quartz, while one solution is saturated with calcite, dolomite, and $CaUO_4$ (pH = 7.7, Ca^{+2} = 40.7 mg/L, UO_2^{+2} = 9.5 mg/L, HCO_3^- = 121 mg/L, PO_4^{-2} = 0.12 mg/L) and the other solution is saturated with $(UO_2)_3(PO_4)_2 \cdot 4H_2O$ (pH = 7.1, Ca^{+2} = 31.8 mg/L, UO_2^{+2} = 0.84 mg/L, HCO_3^- = 90 mg/L, PO_4^{-3} = 4.2 mg/L). The predicted supersaturated state for haweeite and soddyite is in agreement with current understanding on the long time periods required to nucleate and precipitate silicate minerals (Lasaga 1981). Saturation of $CaUO_4$ in the B-16 solution indicates that uranium concentrations may reach about 9 mg/L when $CaUO_4$ is present in the glacial overburden and the PO_4^{-3} concentration is kept below 1 mg/L. In contrast, $(UO_2)_3(PO_4)_2 \cdot 4H_2O$ will be stabilized if the PO_4^{-3} concentration increases to about 4 mg/L, resulting in a lower uranium concentration of about 1 mg/L. Therefore, the presence of PO_4^{-3} in moderate concentration will stabilize the more insoluble phase and prolong the time needed to flush uranium from the soil.

330 As water percolates into the subsurface, HCO_3^- concentrations increase as the CO_2 partial pressure in the soil atmosphere rises (Reactions 2 and 3). As the HCO_3^- concentration increases, the CO_3^{-2} concentration also increases and additional uranium can be complexed by Reactions 17 and 18. Therefore, the solubility of uranium solids is enhanced by the formation of uranyl carbonate species and waters containing higher HCO_3^- concentrations have the ability to dissolve and flush more uranium out of the soil. Solubility calculations performed with the lysimeter data indicate $(UO_2)_2SiO_4 \cdot 2H_2O$, U_3O_7, U_3O_8, U_4O_9, $(UO_2)_3(PO_4)_2 \cdot 4H_2O$, and $Mg(UO_2)_2(PO_4)_2$ are saturated in the porewater if the uranium concentration reaches 13 mg/L at a pH of 7.2 and Eh of 100 mV. A

possible drawback of porewater being saturated with one of the indicated uranium phases is that higher uranium concentrations in the water may result in less desorption of uranium. Therefore, if uranium precipitates persist in the subsurface soil, their dissolution will increase the time needed to desorb uranium from underlying soil.

330 Groundwater present in perched bodies within the glacial overburden has the highest observed concentrations of HCO_3^- in the water/glacial overburden system, and therefore the highest observed uranium concentrations. In line with the same arguments presented for the lysimeter data, the increased HCO_3^- concentrations allow a greater portion of the precipitated uranium to be solubilized and carried out of the system. However, the presence of these secondary precipitates in the perched groundwater system will result in less desorption of uranium along the flow path, with the possibility of additional uranium being partitioned onto the soil.

330 In summary, the future distribution of uranium forms will be similar to the present day distribution with the exception of the removed uranium oxide particles from the surface source. Proposed remediation activities are currently calling for a preliminary remediation goal for uranium in glacial overburden of less than or equal to 50 mg/kg. Uranium concentrations in groundwater will be lowered as a result of soil remediation and source removal, and will continually decrease with time as fresh water percolates through the soil and removes uranium by dissolution and desorption. Dissolution of uranium solids will be enhanced as the fresh water increases its HCO_3^- concentration, but the extent of desorption will be suppressed if the dissolution of uranium solids takes place in advance of encountered adsorbed uranium.

F.3.I.5.0 GEOCHEMICAL PARAMETERS FOR FATE AND TRANSPORT MODELING

F.3.I.5.1 DEFINITION OF GEOCHEMICAL PARAMETERS

Available site-specific data on uranium concentrations in soil and aqueous media are used to define the following geochemical parameters used in the Operable Unit 5 fate and transport model.

- K_l – FEMP term defined as the leaching coefficient in units of L/kg. This coefficient is determined using a batch test that contacts waste or contaminated soil with a distilled water solution adjusted to a pH of 5.6 with sulfuric acid. The batch test is run for 15 to 20 days by tumbling the solid and solution in a reaction vessel, and the final solution is analyzed for uranium. A leaching coefficient is calculated by dividing the uranium concentration on the solid (only uranium in excess of background) by the uranium concentration in solution (i.e., mg/kg ÷ mg/L = L/kg).

- K_l^{calc} – FEMP term defined as the calculated leaching coefficient in units of L/kg. This coefficient represents the in situ leaching coefficient as determined by dividing the uranium concentration for the contaminated soil (only uranium in excess of background) by the uranium concentration in perched groundwater contacting the soil (i.e., mg/kg ÷ mg/L = L/kg). The calculated leaching coefficient applies to soils in the upper 15 feet of glacial overburden, where weathering and fractures allow particulate uranium to be transported to depth.

- K_d – the adsorption/desorption value or partition coefficient in units of L/kg. The partition coefficient is determined by batch tests that contact soil with spiked uranium solutions (adsorption) and distilled water (desorption). A partition coefficient is calculated by dividing the uranium concentration on the solid (only uranium in excess of background) by the uranium concentration in solution (i.e., mg/kg ÷ mg/L = L/kg). In general, only an adsorption or desorption value is determined from the batch test and the assumption is made that the reaction is reversible (i.e., adsorption = desorption = K_d). These tests are conducted with uncontaminated soil (adsorption) or contaminated soil that are known to contain only adsorbed uranium (desorption).

- K_d^{calc} – the calculated adsorption/desorption value or calculated partition coefficient in units of L/kg. The calculated partition coefficient represents the in situ partition coefficient as determined by dividing the adsorbed uranium concentration for the contaminated soil (only uranium in excess of background) by the uranium concentration in perched groundwater contacting the soil (i.e., mg/kg ÷ mg/L = L/kg). The calculated partition coefficient applies to soil in unweathered gray till at depths of 15 to 20 feet below the surface, where weathering and fractures are absent and uranium is transported only as a dissolved specie.

- K_e – the extractable uranium present in contaminated soil in units of percent total uranium. This parameter represents the extractable portion of uranium that can be removed from contaminated soil by washing techniques proposed for the Operable Unit 5

FS. Preliminary batch tests indicate 30 to 90 percent of the total uranium present can be extracted using soil washing reagents.

331 For contaminated soil, a value of K_l can be calculated considering the total or only the extractable contaminant mass in the soil. Value of K_l is lower when only the extractable contaminant mass is considered. For example, when K_e is about 1 percent, the corresponding K_l is usually less than 1 percent of the K_l value based on total contaminant mass. In this RI report, K_e for all the contaminants was assumed to be 100 percent. Therefore, the K_l was based on the total contaminant mass and has a high value for soil outside of the former production area.

The distinction between the parameters K_l and K_d is based on the type of uranium solid that is present in the soil. For K_l, uranium may be present as particulate and adsorbed uranium, and the leaching coefficient measures uranium mobilization due to dissolution and desorption. The K_d is a measurement of adsorption/desorption equilibrium between soil and water, and solid uranium in excess of background is present only as adsorbed uranium.

331 In the Operable Unit 5 RI Report, the fate and transport model describing uranium migration in the glacial overburden used K_l or K_l^{calc} to define the initial loading of uranium. For example, a kilogram of soil contains 150 mg of uranium and the K_l is determined to be 20 L/kg. Using these values, the first volume of rainwater to move through this soil is estimated to have a uranium concentration of 7.5 mg/L (i.e., 150 mg/kg ÷ 20 L/kg). Each successive pore volume of water will have a lower uranium concentration as the extractable percent of uranium becomes depleted. A calculated depletion curve is used to determine the uranium loading as a function of time. Once uranium is loaded into the aqueous medium and transport begins through the glacial overburden, K_d or K_d^{calc} is used to calculate the uranium retardation factor for the glacial overburden. Further details on the use of these parameters are developed below.

F.3.I.5.2 SITE-SPECIFIC GEOCHEMICAL PARAMETERS

Available information that can be used to assign geochemical parameters for fate and transport modeling include site-specific batch tests with waste materials and contaminated and uncontaminated soil, existing uranium analytical data on glacial overburden and perched groundwater, and pertinent literature studies conducted with similar soil. The current range of site-specific geochemical parameters is given in Table F.3.I.5-1.

For contaminated soil defined as waste materials (Table F.3.I.5-1), the K_l values range from 12 to 1708 L/kg and K_l^{calc} from 0.6 to 3558 L/kg. This wide range in leaching coefficients reflects both the variation in solubility of the uranium solids present in the soil (see Table F.3.I.3-2) and the amount of time adsorbed uranium has been present on the soil particles. Soil (containing soluble uranium forms (e.g., UF_6) and physically adsorbed uranium (as opposed to chemisorbed uranium) readily release the uranium to solution, resulting in low leaching coefficients. Conversely, less soluble uranium particles (e.g., UO_2) and chemisorbed uranium are slowly released to solution, resulting in high leaching coefficients.

For the Operable Unit 5 fate and transport model, the leaching coefficients that reflect the present release of uranium from contaminated soil range from 12 to 311 L/kg (Table F.3.I.5-1). This range is in good agreement with the mean values reported for K_l^{calc} in the production area, with 14 L/kg representing the soluble uranium forms and 301 L/kg the less soluble uranium solids. Therefore, uranium loadings in the fate and transport model will be derived using leaching coefficients near 12 L/kg when aqueous spills and/or soluble uranium forms are known or suspected to be present (i.e., in the Plant 2/3, Plant 6, and Plant 9 areas) and by using values near 311 L/kg when less soluble forms of uranium are present. This latter condition presently holds for most of the site soil where residual uranium oxide particles are the dominant source of uranium.

332 In order to present the general geochemical conditions at the FEMP, the areas with low K_l are conservatively defined as shown in Figure F.3.4-1. This areal delineation of low K_l areas considers the potential uncertainty in the locations of actual boundaries. However, in the Operable Unit 5 FS, perched groundwater analyses that show elevated uranium concentrations will be mapped to wells in the production area to delineate the suspected areas of spills and/or leaks in higher resolution. These perched groundwater plumes will be used with soil data to refine the delineation of low K_l areas and to appraise their correlation. The refined delineation will be used to determine extents of required soil excavation during the cleanup.

After uranium is leached from the source it is free to migrate through the glacial overburden; the fate and transport model uses K_d or K_d^{calc} to describe the retardation of uranium by the glacial overburden. Glacial overburden K_d values derived from adsorption batch tests range from 11 to 40 L/kg, with a combined mean of 25 L/kg for the four reported values (Table F.3.I.5-1). The K_d^{calc} values are grossly different for production area soil associated with aqueous spills (12 to 32 L/kg) as

compared to the soil known to be contaminated solely by release of uranium from surface particles (75 to 2433 L/kg). Discreet ranges of K_d^{calc} for these two areas are interpreted to reflect the difference in surface reaction kinetics associated with adsorption and desorption, as discussed in Section F.3.I.3.0 and conceptualized below.

Leaching of uranium results in a migrating plume away from the source. The front of this plume reaches an underlying soil horizon and the uranium concentration in the plume continues to increase at this horizon as the plume passes through. As long as the surface source is present, the uranium concentration in the plume will increase toward its maximum concentration and adsorption of uranium will be the dominant process at this soil horizon if the maximum concentration (i.e., the peak) of uranium remains below the solubility limit of uranium solids. To illustrate, assume partition-coefficient equilibrium (a tenet of the fate and transport model) between the aqueous and solid phases is given by:

$$\text{adsorbed uranium (mg/kg)} \div \text{aqueous uranium (mg/L)} = 24 \text{ L/kg}$$

where 24 L/kg is the average K_d value for the Operable Unit 2 and Brookhaven National Laboratory (BNL) adsorption studies (Table F.3.I.5-1). As the aqueous uranium concentration increases, uranium must be adsorbed onto the solid to satisfy the partition-coefficient equilibrium. Therefore, desorption is not favored as long as the aqueous uranium concentration is increasing toward the peak concentration.

332 Removal of the uranium source will result in dilution of the uranium plume by fresh infiltrating rainwater, which will lower aqueous uranium concentrations and initiate desorption to satisfy the partition-coefficient equilibrium. However, as noted in Section F.3.I.3.0, desorption values are greater than adsorption values when enough time is available (i.e., decades) for chemisorption to occur because chemisorption imparts a hysteresis to the adsorption/desorption process that prevents desorption of the entire mass of adsorbed uranium. Using the partition-coefficient expression above and the principle of chemisorption, adsorbed uranium will not completely desorb in response to a decreasing aqueous uranium concentration and the partition coefficient must increase to account for the hysteresis phenomenon. Therefore, if the migrating plume takes decades to pass a given horizon of the soil (a common observation), ample time has passed for chemisorption to occur and calculated desorption values will exceed adsorption values.

332 These adsorption and desorption concepts can be applied to glacial overburden in the production area. Glacial overburden soil contaminated by aqueous spills is experiencing active adsorption (12 to 32 L/kg, Table F.3.I.5-1), due to the presence of a soluble uranium source that is leaching uranium concentrations in the plume. Soil contaminated by the release of uranium from air emissions are experiencing desorption (75 to 2433 L/kg, Table F.3.I.5-1), because discreet, limited past releases of soluble particles (e.g., UF_6) have been dissolved by rainwater and the peak concentration from the dissolution of these particles has passed through the overburden (the Operable Unit 5 FS is currently delineating the boundaries for production areas contaminated by aqueous spills and those areas receiving only air emissions). The less soluble uranium oxides remaining on the surface do not leach as readily as uranium fluoride particles, resulting in a decrease in the aqueous uranium concentration in the plume and initiation of the desorption process.

Historical information on uranium releases (Section F.3.I.2.0) supports the conceptual model of adsorption in areas of aqueous spills/leaks versus desorption in areas that received only uranium particles from air emissions. Aqueous spills and leaks occurred on a continuous basis from production activities associated with Plants 2/3, 6, and 9, and these activities have placed a large source of soluble uranium in local areas of the glacial overburden. Air emissions of uranium fluoride and oxide particles cover the entire production area, with uranium oxides comprising about 75 percent of the released mass (Section F.3.I.2.0). As rainwater rapidly dissolved the soluble uranium fluoride particles, the resulting plume reached its maximum uranium concentration quickly and this peak has passed through the glacial overburden in most areas (i.e., desorption is now occurring in these areas). Around Plants 2/3, 6, and 9, the large source of soluble uranium has not been depleted, and the uranium concentration in the migrating plume continues to increase (i.e., adsorption is occurring in these areas). Therefore, adsorption values best describe uranium retardation in areas having soluble uranium sources.

332 Independent evidence for active adsorption in the Plant 2/3, Plant 6, and Plant 9 areas can be found in the adsorption values obtained from the Operable Unit 2 and BNL studies (Table F.3.I.5-1). The average K_d value derived from these adsorption studies is identical to the K_d^{calc} average reported for production area soil contaminated by aqueous spills (i.e., 24 L/kg). Given the Operable Unit 2 and BNL batch-test results and in situ measurements from the production area, a K_d value of 24 L/kg is recommended for the fate and transport model to describe the adsorption of uranium onto glacial overburden, if the migrating plume hasn't reached its peak concentration. When soluble forms of

uranium have been depleted from the source and the plume peak takes decades to pass through the glacial overburden, larger K_d values are warranted to describe the desorption. The best estimate of K_d for the fate and transport model when desorption is occurring is the K_d^{calc} geometric mean of 270 L/kg (Table F.3.I.5-1). A sensitivity analysis conducted with the fate and transport model has bounded the uranium migration using values of 15 and 222 L/kg. The slight difference in these and the recommended values will produce no significant change in the existing sensitivity analysis.

Numerous uranium adsorption values have been reported in the literature, and a summary by Sheppard et al. (1984) lists several studies conducted under a variety of conditions that cover a range of uranium adsorption values from 0.13 to 790,000 L/kg. The studies summarized in Sheppard et al. (1984) that are most pertinent to the FEMP glacial overburden and Great Miami Aquifer are those of Rancon (1973) and Yamamoto et al. (1973).

Rancon (1973) studied the adsorption of uranium on carbonate soil and reported uranium adsorption values of 16 and 33 L/kg, respectively. These values are in good agreement with the Operable Unit 2 and BNL adsorption studies (Table F.3.I.5-1), and indicate that the adsorption behavior of uranium in carbonate soils is remarkably consistent.

332 Yamamoto et al. (1973) investigated uranium adsorption onto sandy soil from carbonate solutions and reported uranium adsorption values of 0.13 to 0.25 L/kg. These low values reflect the coarse particle size (i.e., reduced surface area) and composition (i.e., lack of carbonate minerals, aluminum and iron oxyhydroxide surfaces, and clay minerals) of the sandy soil and the complexation of uranium by carbonate ion (Reactions 17 and 18 in Section F.3.I.3.0). Results from this study are close to the lowest value reported for the saturated sand and gravel aquifer in the south plume area (Table F.3.I.5-1), and may be appropriate for examining adsorption in the Great Miami Aquifer.

F.3.I.5.3 SUMMARY

Experimental data derived from batch tests, site-specific uranium concentrations in soil and groundwater, and literature studies are used to define and justify the assignment of geochemical parameters to the ODAST fate and transport model of the glacial overburden. Leaching of uranium from near-surface Operable Unit 5 soil sources has been investigated with batch tests and analytical measurements on site-specific soil and groundwater samples to define the 12 to 311 L/kg range for K_l and K_l^{calc} values. The K_l and K_l^{calc} values are used to develop uranium loading curves as a function

of time, and these curves are used as input data to the fate and transport model. The large range in K_1 and K_1^{calc} values reflects the heterogeneity of uranium forms in the contaminated soil.

Adsorption batch tests, uranium analyses of site-specific soil and groundwater samples, and literature studies indicate that the adsorption of uranium onto glacial overburden soil is best defined using a K_d value of 24 L/kg. The uniform range of adsorption values for several independent studies reflects the homogeneous distribution of uranyl carbonate species in the groundwater/glacial overburden environment. Desorption of uranium will occur when the plume peak has passed through the overburden or when the uranium source is removed from the glacial overburden, and a K_d value as high as 270 L/kg may be used to model the desorption of uranium. A large range in the observed desorption values (75 to 2433 L/kg) reflects chemisorption of uranium by the soil particle surface; with chemisorption favored by increasing residence time. Modeling a desorption scenario will apply to source areas depleted of their soluble uranium or areas where the source is excavated and removed.

TABLE F.3.I.5-1

RANGE OF SITE-SPECIFIC GEOCHEMICAL PARAMETERS

Media	Parameter (L/kg)	Range
Waste Materials		
Plant 2/3, Plant 6, and Plant 9 contaminated soil	K_l^{calc}	0.6 - 8.35[a] (14[b])
Remaining production area contaminated soil	K_l^{calc}	75 - 3,558[a] (301[b])
OU2 waste	K_l	37 - 177[c]
OU2 contaminated soil	K_l	200 - 280[c]
OU4 contaminated soil	K_l	12 - 15[c]
OU5 contaminated soil	K_l	12 - 311[d]
Contaminated soil studied by Oak Ridge National Laboratory	K_l	64 - 1708[e]
Glacial Overburden		
OU2 soil	Adsorption K_d	11 - 40[c]
BNL study	Adsorption K_d	23 - 25[f]
Production area subsurface soil contaminated by aqueous spills	Adsorption K_d^{calc}	12 - 32[g] (24[h])
Production area subsurface soil contaminated by air emissions	Desorption K_d^{calc}	75 - 2,433[g] (270[b])
Unsaturated Sand and Gravel		
OU2 South Field	K_d	10 - 12[c]
Saturated Sand and Gravel		
OU1 waste pit area	K_d^{calc}	2 - 68[i] (14[b])
OU2 South Field	K_d	6 - 9[c]
South Plume area	K_d^{calc}	0.8 - 4.4[i] (2.7[h])
Calibration of SWIFT model	K_d^{calc}	1.8

[a]Production area soil contaminated by uranium releases, as indicated in Table F.3.II.3-3.
[b]Geometric mean for indicated range.
[c]DOE (1993c). K_l determined from 17-day batch test with deionized water at initial pH of 5.6. Adsorption K_d determined from 17-day batch test with spiked solution.
[d]Unpublished preliminary results from OU5 soil washing studies. K_l determined from 17-day batch test with deionized water at initial pH of 5.6.
[e]Lee et al. (1993). K_l determined from 21-day batch test with deionized water.
[f]IT (1993). K_d determined from 60-day batch test with spiked perched groundwater.
[g]Production area subsurface soil between 15 and 20 feet below the surface contaminated by uranium releases, as indicated by Wells 1348, 1354, 1360, 1266, 1317, 1341, 1225, 1230, and 1250 in Table F.3.II.
[h]Arithmetic mean for indicated range.
[i]DOE (1993a). Appendix A, Issue 3 and 5 Report.

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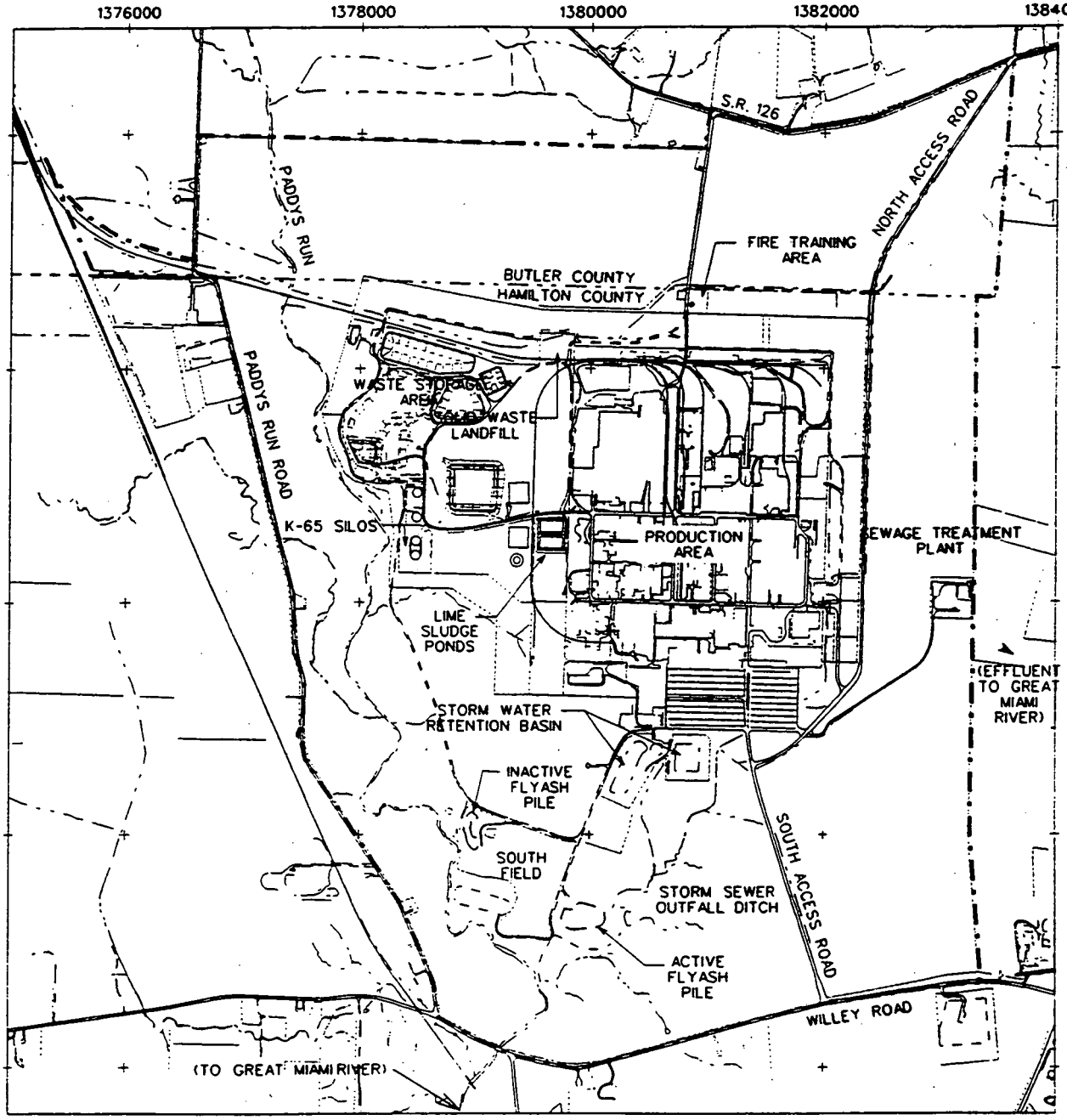

LEGEND:

— · · — · · COUNTY LINE

— — — — — FEMP BOUNDARY

SCALE

1400 700 0 1400 FEET

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c:\10013.dgn FER UUS RIDATA 6-17-94 STATE PLANAR COORDINATE SYSTEM 1927

FIGURE F.3.I.2-1. MAJOR FEATURES OF THE FEMP

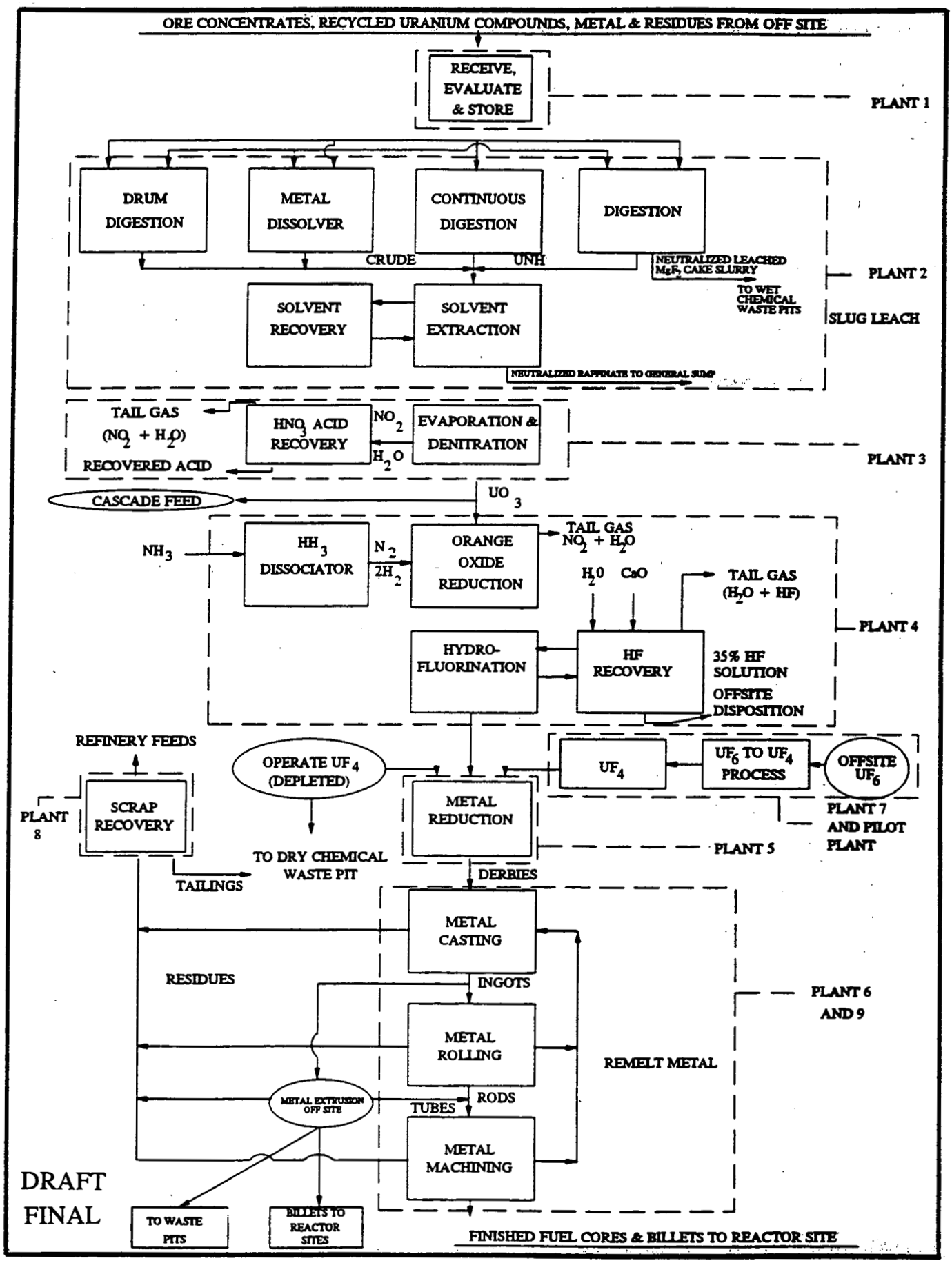

FIGURE F.3.I.2-2. SCHEMATIC DIAGRAM OF THE FEMP PROCESS

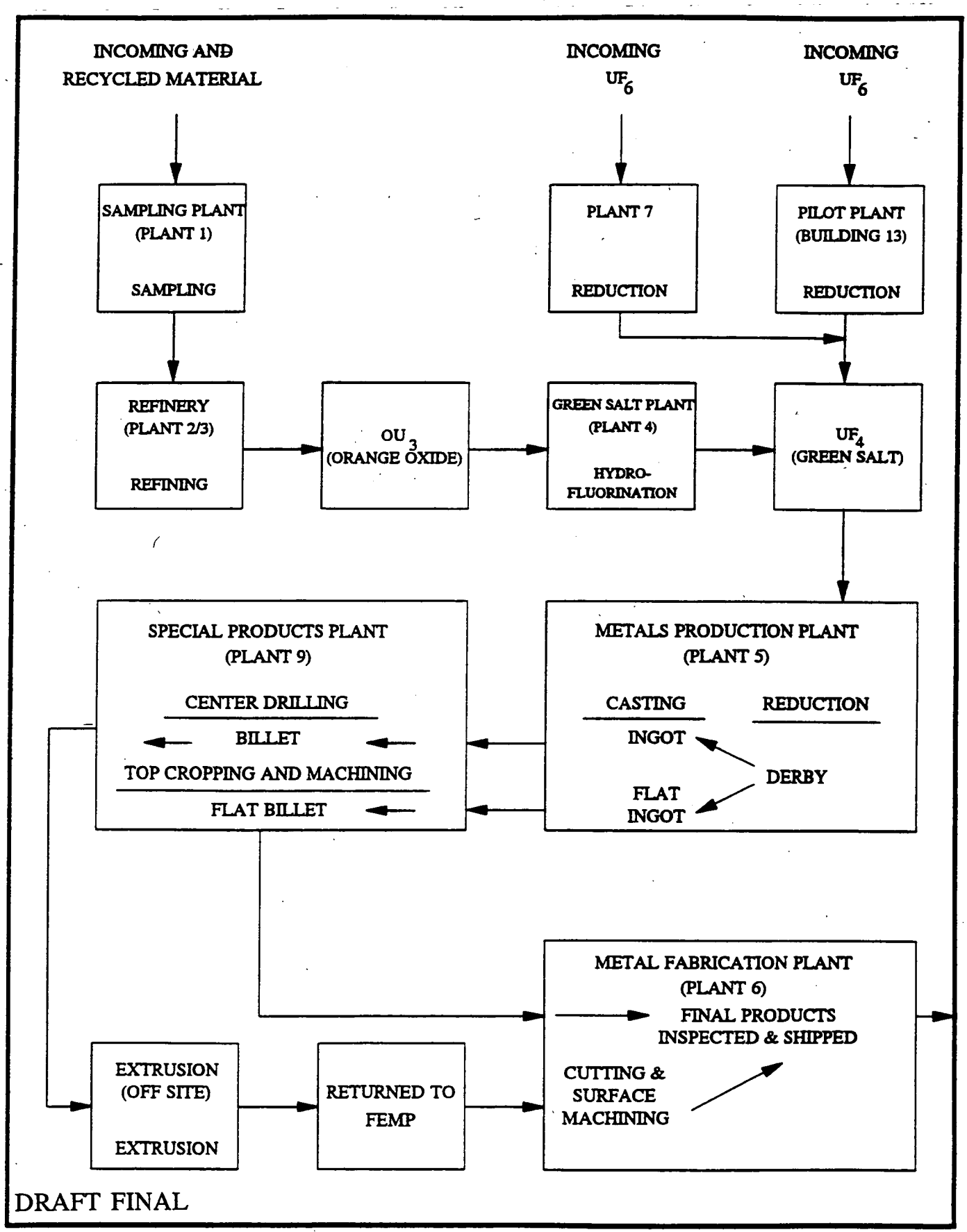

FIGURE F.3.I.2-3. URANIUM METAL PROCESS DIAGRAM

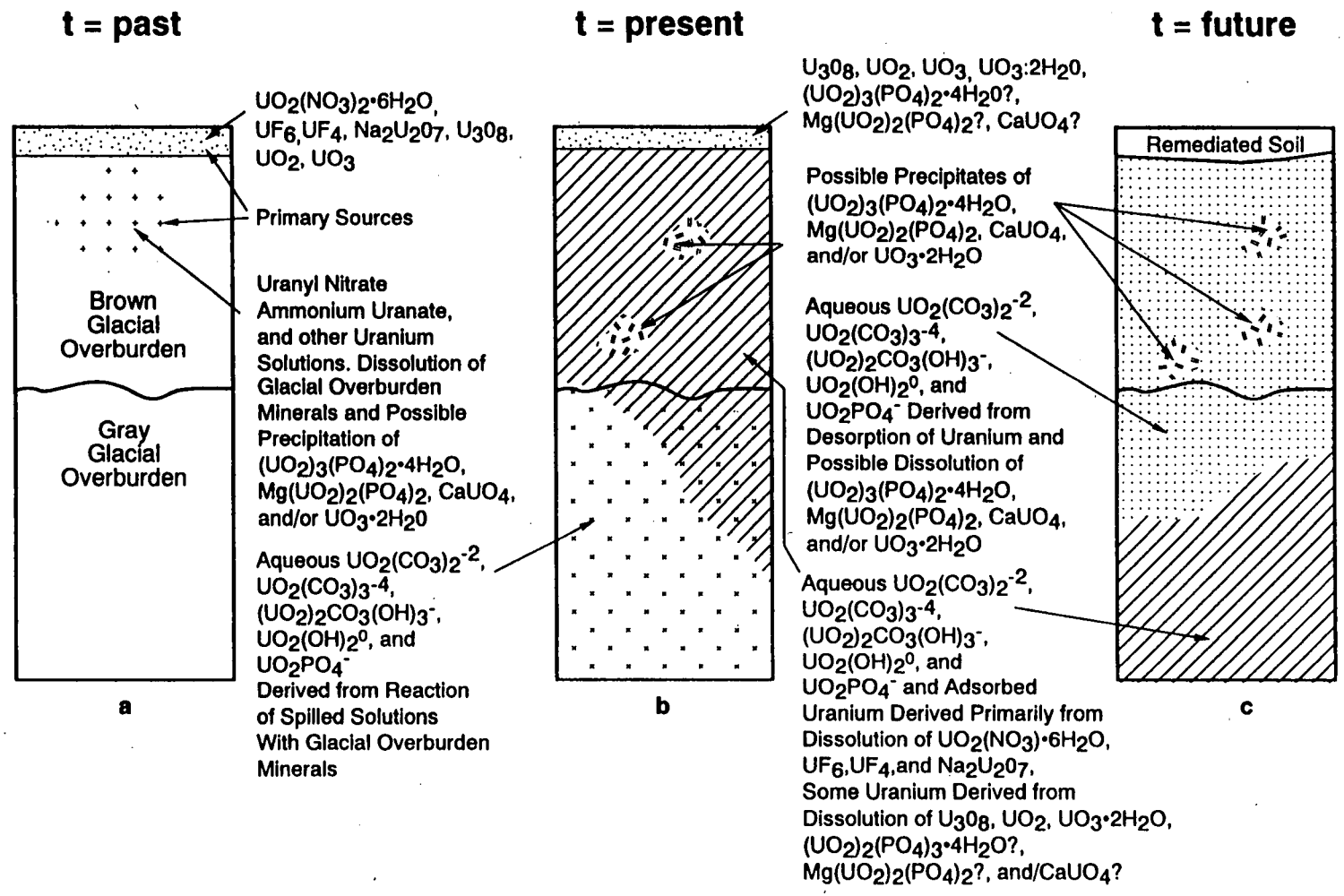

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FIGURE F.3.I.4-1 URANIUM DISTRIBUTION RESULTING FROM AQUEOUS AND PARTICULATE SOURCES

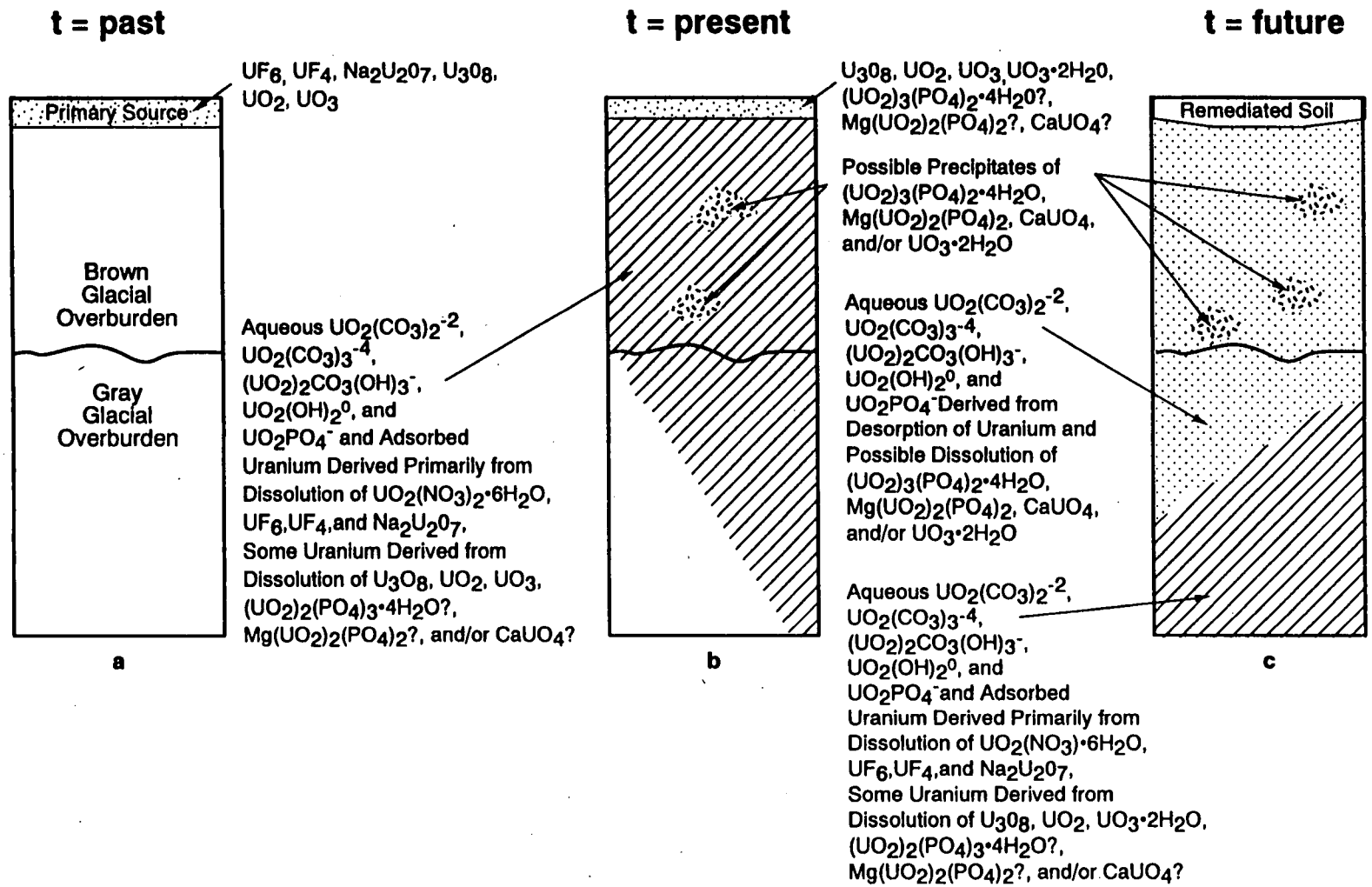

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FIGURE F.3.I.4-2 URANIUM DISTRIBUTION RESULTING FROM PARTICULATE SOURCES

ATTACHMENT F.3.II

ZONATION AND VALUES OF GEOCHEMICAL PARAMETERS FOR FATE AND TRANSPORT MODELING

F.3.II.1.0 INTRODUCTION

This attachment presents the strategy for determining the zonation and values of contaminant-specific geochemical parameters in the Operable Unit 5 groundwater fate and transport modeling. Contaminant-specific geochemical parameters discussed include: percent of extractable/leachable contaminant (K_e) in the sources; source leaching coefficient (K_l) in the sources; solid-liquid partition coefficient (K_d) in the migration media; and retardation factor (R_d) in the migration media. These parameters have significant impacts on the estimates of contaminant mass, source leachate concentrations, and loading and migration rates. Therefore, it is important that values of these model parameters are properly assigned for the RI/FS fate and transport modeling. Available site-specific data, as well as release history and geochemical concepts of the distribution of uranium contamination at the Fernald Environmental Management Project (FEMP) discussed in Attachment F.3.I, were considered when developing the modeling approach and assigning parameter values.

The remainder of this section describes the purpose of each of the above-listed geochemical parameters. Section F.3.II.2.0 presents the general approach for determining contaminant-specific zonation and values of these parameters for Operable Unit 5 contaminants of potential concern (CPCs). Because uranium is the predominant contaminant at the FEMP and is the focus of the solute transport model recalibration task (DOE 1993), Section F.3.II.3.0 summarizes the available site-specific information on geochemical parameters for uranium. Results of a screening model (i.e., ECTran) confirmation process for proposed parameter values of uranium are also presented.

F.3.II.1.1 GEOCHEMICAL PARAMETERS

In addition to the four previously mentioned geochemical parameters (modeled by using the EQ3/6 model), chemical solubility limits have been used in Operable Units 1, 2 and 4 RI fate and transport modeling as constraints for contaminant leachate concentrations. However, only a small number of inorganic contaminants were affected by their solubility limit constraints. Because of the high uncertainty associated with geochemical modeling and relatively low contaminant concentrations found in the Great Miami Aquifer, area-specific chemical solubility limits will not be developed for Operable Unit 5 RI modeling. Also, it was determined that chemical solubility limits will not be used to constrain the source leachate concentrations in Operable Unit 5 sources which are already in the

environmental media. Solubility limits developed in other operable units will be referenced when necessary (i.e., during the supplemental modeling characterization).

The four geochemical parameters to be evaluated are described in following subsections.

F.3.II.1.1.1 Source Leaching Coefficient (K_l or K_l^{calc})

Source leaching coefficients are a measure of uranium mobilization due to dissolution and desorption. These coefficients are appropriate for uranium which is present as particulate and adsorbed uranium in source material. There are two types of solid-liquid leaching coefficients including K_l and K_l^{calc}. K_l and K_l^{calc} are used to define the initial aqueous loading of uranium based on the extractable portion of uranium (i.e., K_e) in the soil. K_l is determined using a batch test that contacts waste or contaminated soil with leaching solution. The coefficient is calculated by dividing the uranium concentration on the solid (only uranium in excess of background) by the uranium concentration in solution. In comparison, K_l^{calc} is an insitu leaching coefficient estimated from contaminated soil (only uranium in excess of background) and the uranium concentration in perched groundwater. The calculated leaching coefficient applies to soil in the upper 15 feet of glacial till, where weathering and fractures allow particulate uranium to be transported to depth.

For other contaminants, K_d values in the media are used to approximate K_l values. This approach is very conservative and was necessary to conduct modeling to support the Baseline Risk Assessment. The approach is conservative since for any contaminant the K_l is at least as high as and usually higher than K_d by definition. By using the lower K_d value instead of K_l, a higher source leachate concentration will be generated in the fate and transport model.

F.3.II.1.1.2 Solid-Liquid Partition Coefficient (K_d or K_d^{calc})

Solid-liquid partition coefficients are used in fate and transport modeling to simulate the reversible adsorption/desorption processes of contaminants. K_d is commonly defined as the constant ratio between solid phase and dissolved phase concentrations of a chemical at equilibrium in fate and transport models (i.e., a linear isotherm). Therefore, chemicals with higher K_d values are more likely to be adsorbed onto soil materials and thus have less potential to migrate in the subsurface media. K_d is determined by batch tests that contact soil with spiked uranium solutions (adsorption) and distilled water (desorption). Only uranium concentrations for contaminated soil in excess of background are used to calculate K_d. K_d^{calc} is an insitu partition coefficient estimated from contaminated soil (only

adsorbed uranium in excess of background) and the uranium concentration in perched groundwater. The calculated partition coefficient applies to soil in unweathered glacial till at depths of 15 to 20 feet below the surface, where weathering and fractures are absent and uranium is transported only as a dissolved specie. Once uranium is loaded into the aqueous medium and transport begins through the glacial till, K_d or K_d^{calc} are used to calculate the uranium retardation factor for glacial till.

F.3.II.1.1.3 Percent of Extractable Contaminant in the Waste Materials (K_e)

Although the adsorption/desorption process is usually considered to be reversible in fate and transport modeling, in reality, the longer a contaminant remains adsorbed to the surface of a solid the more likely it is to be incorporated into the solid by surface reactions where it is no longer available for desorption under environmental conditions. Therefore, an estimate of the percent of extractable contaminant in the sources, which are usually solid phase waste or soil, is required to determine the source leachate concentration and contaminant mass available for future transport. When K_e is applied in the modeling, the solid phase concentration, K_l, and K_d will only be determined for the extractable portion of the contaminant.

F.3.II.1.1.4 Retardation Factor (R_d)

557 The contaminant travel time from a source area to the exposure points is one of the major concerns in risk assessment. For determining the contaminant travel time, the retardation factor is defined as the ratio between the groundwater flow velocity and chemical migration velocity through the soil matrix. Because most contaminants have higher tendency to adsorb to soil than remain dissolved in water, they usually migrate slower than water in the subsurface environment. Therefore, R_d is usually greater than 1. In fate and transport modeling R_d is estimated by considering both the contaminant characteristics (i.e., K_d) and the soil properties such as dry bulk density and moisture content of the soil. Retardation factor (R_d) is usually calculated by using K_d, soil bulk density (d), and soil moisture content (n) (or effective porosity when the soil is saturated) in the following equation: $R_d = 1 + K_d (d / n)$. Since K_d is the only contaminant-specific geochemical parameter that will determine the value of R_d, the following approaches for determining contaminant-specific zonation and values of K_d also apply to R_d and the zonation and values of R_d will not be described.

F.3.II.1.2 ZONATION

In reality, none of the geochemical parameters discussed here are spatially invariant. However, because of the complexity of the soil matrix, simplifications of the natural systems are necessary in

fate and transport modeling. The first simplification process is to determine the zonation of each major geochemical parameter. Zonation of geochemical parameters consists of dividing the modeling domain into manageable zones (i.e., vertical and areal) of different geochemical conditions and assigning values of model parameters based on available zone-specific chemical and geological information. Zonation for geochemical parameters (i.e., K_l, K_d, K_e, and R_d) is chemical-specific and usually assumed temporally constant in the fate and transport model. The technical approach for zonation of these four major geochemical parameters is described later in this attachment.

F.3.II.1.3 PARAMETER VALUES

After zones are identified, zone-specific values of each geochemical parameter need to be assigned for every contaminant of concern. Values can be obtained from field tests, laboratory experiments, model calibrations, previous studies with similar conditions, or literature searches. These parameter values are then used to determine source loading terms and incorporated into the fate and transport model.

F.3.II.2.0 GENERAL TECHNICAL APPROACH

In order to ensure that the fate and transport modeling results are acceptable for risk assessment, important guidelines must be followed in assigning the values and zonation of contaminant-specific geochemical parameters and they are:

- Use site-specific values when available
- Select the most conservative but realistic assumption/estimate based on performance measures such as contaminant exposure point concentrations or travel times to exposure points when evaluating parameter/zonation choices
- Verify modeling results by comparing with available measured conditions.

Based on these guidelines, the following subsections summarize the general technical approach for zonation and assigning parameter values in Operable Unit 5 RI/FS groundwater fate and transport modeling.

F.3.II.2.1 CONTAMINANT-SPECIFIC APPROACH FOR ASSIGNING GEOCHEMICAL PARAMETERS

Based on the types and amount of available site-specific data and the extent of contaminants, different approaches will be used to assign contaminant-specific values of geochemical parameters. The following subsections discuss the approaches to be followed in the contaminant source areas and migration media.

F.3.II.2.1.1 Source Areas

Past contaminant loadings from other operable units which can impact the Great Miami Aquifer will be included in the Operable Unit 5 RI fate and transport modeling during the supplemental modeling characterizations. In the previous RIs, no K_e or K_l have been defined in the modeling. Only K_d was conservatively used in the modeling to simulate both the source leaching and media attenuation processes. Contaminant-specific mass inventories, leachate concentrations, and loading rates used in previous modeling for Operable Unit 1, 2, and 4 RIs will be directly imported into the Operable Unit 5 RI fate and transport models. Therefore, geochemical parameters (i.e., K_d) will remain generally the same as previously assigned for these source areas. However, batch test results obtained for uranium in contaminated soil from Operable Unit 4 areas will be used instead of the K_l/K_d value (i.e., 1.8 L/kg) assumed in the previous Operable Unit 4 RI modeling. These batch test results became available after the Operable Unit 4 RI was completed.

Geochemical parameters for additional contaminant source areas defined in Operable Unit 5 will be determined by using area-specific contaminant concentrations measured in insitu leachate, waste material, and/or toxicity characteristic leaching procedure (TCLP) samples. In addition, results are available for batch tests which were conducted for surface soil in the Operable Unit 5 area for uranium. Consideration of the various chemical forms/species in contaminant sources may result in different values of geochemical parameters for the same contaminant in different areas, as discussed in the Attachment F.3.I. When no site-specific information is available for determining K_l and K_e for contaminants, conservative assumptions (e.g., the 70-year rule) will be made for estimating the source leachate concentration and mass loading rates. When the 70-year rule is applied, the total mass of a contaminant in the source area will be released into the media in 70 years. Figure F.3.II-1 presents the general process for determining the source leachate concentration according to the above discussion.

In the modeling for the RI, K_e is conservatively assumed to be 100 percent for all the contaminants in every Operable Unit 5 source area. It is expected that K_e will be assumed to be 100 percent for all the contaminants except uranium in the modeling for Operable Unit 5 FS.

F.3.II.2.1.2 Migration Media

For the fate and transport modeling K_e and K_l will only be applied during the initial source term determination (i.e., available contaminant mass and source leachate concentration). Therefore, K_e and K_l do not apply to the migration media. Only K_d and R_d are required for simulating contaminant migration in the media. Contaminant concentrations in both groundwater and soil media will be used to define zonation and values of K_d and R_d. Values and zonation of intermediate parameters such as fraction of organic content (FOC) used in calculating K_d for organic contaminants, and soil porosity and moisture content used in calculating R_d will also be defined in the process. When site-specific data is unavailable for a contaminant, conservative literature values will be used to assign K_d values in the migration media.

Parameter values will be assigned to each geologic unit separately (i.e., glacial overburden, unsaturated Great Miami Aquifer, and saturated Great Miami Aquifer). However, the geochemical concepts of the distribution of uranium contamination presented in Attachment F.3.I points out that K_d can have different values for on-going sources and depleted sources in the same media. Because the fate and transport models used cannot incorporate time-varying K_d values, simplifications of the geochemical conceptual model are required. Uniform contaminant-specific values of K_d and R_d in a geologic unit will be used for most of the contaminants based on their current states (i.e., on-going or depleted sources). Further zonation of K_d values for a contaminant will only be considered when field data show significant variations of the parameter in a geologic unit (i.e. order of magnitude differences).

F.3.II.2.2 MODEL CALIBRATION AND PERFORMANCE EVALUATION

As stated in the Groundwater Model Evaluation Report and Improvement Plan (DOE 1993a) and as presented in the SWIFT Great Miami Aquifer Model Summary of Improvements Report (DOE 1994), formal solute transport model calibration was performed only for uranium during the model improvement process. In order to verify the values of geochemical parameters for other contaminants, fate and transport modeling results were compared with contaminant concentrations measured in the field during the RI model applications.

When full model calibrations are not necessary because of the relatively small extent of contamination, the modeling results for these contaminants still need to be realistic or conservative when compared to field measured conditions. During the RI fate and transport modeling, model-performance evaluations were conducted for contaminants that have elevated concentrations in the Great Miami Aquifer. Model simulated results for these contaminants were compared with measured concentrations. If necessary, the values of geochemical parameters or mass loading terms were adjusted to obtain better agreement between modeled and measured concentrations (i.e., within the same order of magnitude). Available measured concentrations for all the contaminants of concern at the current time are presented together with final simulated concentrations in the modeling documentation. The model performance evaluation and uncertainty analysis are of particular importance for contaminants where site-specific data is available for determining the values of geochemical parameters.

F.3.II.3.0 GEOCHEMICAL PARAMETERS FOR URANIUM

Because uranium is the predominant contaminant at the FEMP, preliminary zonation and values of K_l, K_d and K_e for uranium are summarized in this Attachment. The zonation and values of uranium geochemical parameters presented here are based on currently available data and will be refined if necessary in future (i.e., FS) fate and transport modeling.

An ECTran screening-level model confirmation process has been conducted and is described in this document. The objective of this process was to verify that the estimated geochemical parameter values of uranium are reasonable by comparing modeling results, using these parameter values, with measured groundwater and soil conditions at the FEMP.

F.3.II.3.1 SOURCE LEACHING (K_l) AND SOLID-LIQUID PARTITION (K_d) COEFFICIENTS FOR URANIUM

559 For the RI baseline fate and transport modeling, uranium source K_l and K_d in the glacial overburden are assumed to have the same value for the same source area. This assumption is used to represent two different types of contaminant sources (i.e., on-going and depleted) described in Attachment F.3.I. The term "depleted" source is defined as contaminated soil in which only a low percentage (i.e., K_e less than 10 percent) of remaining uranium contamination concentration is leachable. When K_l (measured) is higher, which indicates a depleted source, the K_d value is also

higher in the media in order to simulate a desorption-dominated transport process. When K_l (measured) is lower, which indicates an ongoing source, the K_d value is also lower in the media for simulating an adsorption-dominated transport process. This assumption is generally supported by data available at the FEMP. However, the uncertainty analysis in the Operable Unit 5 RI will also evaluate other conditions regarding the source types and K_d values. Additional geochemical data is also being collected to support the Operable Unit 5 FS.

The following subsections summarize currently available data for determining the K_l and K_d values for uranium. Some of this information has been discussed in Attachment F.3.I.

F.3.II.3.1.1 Available Data

Available site-specific information that can be used to determine K_l and K_d values of uranium include existing analytical data for soil and perched groundwater concentrations measured in the glacial overburden, contaminated and uncontaminated site soil, TCLP data for source soil, previous geochemical studies, and recently completed batch tests with waste materials and contaminated soil. Table F.3.I-5 in Attachment I and Figure F.3.II-2 summarize the overall ranges and locations of available site-specific uranium K_l and K_d values at the FEMP, respectively. The following subsections describe this information in more detail. For comparison purposes, a summary of literature K_d values for uranium is also presented.

Literature Values

A literature search was performed to determine the possible range of K_d values for uranium. Literature values for K_l are not readily available and will therefore not be presented. However, theoretically K_l is generally higher than K_d. Table F.3.II-1 presents the results of the literature search. As can be seen in the table, the range of K_d values is quite large and the values vary significantly between soil types. The EXP(u) values in Table F.3.II-1 are the geometric means of all the measurements for the same soil type.

Analytical Data From Monitoring Wells

When both the soil and groundwater concentrations of uranium at the same location are measured, a K_l or K_d value can be determined by simply calculating the ratio of the soil concentration minus the background soil concentration over the groundwater concentration.

There are more than 100 sets of soil and perched water uranium concentrations available from the Type 1 wells installed in the former production area. These soil and perched water uranium concentrations were used to estimate the site-specific K_l and K_d values for uranium in the production area. The pair of soil and perched water concentrations for each well used in the calculation represent the average soil and perched water uranium concentrations from all samples taken at about the same time along the screen interval of the well. As explained in Attachment F.3.I, the samples taken within the weathered zone in the glacial overburden are representative of K_l conditions, while the samples taken within the unweathered zone are used to calculate K_d values. Because perched water flow velocities are low in the glacial overburden, it is reasonable to assume that the measured soil and liquid phase concentrations are under equilibrium conditions. Before dividing soil concentrations by the corresponding perched water concentrations to determine K_l and K_d values, the reported soil concentrations were corrected by subtracting the mass of uranium contained in the soil moisture (assuming the moisture content is 20 percent by weight in the saturated soil sample) and the background uranium concentration in the soil. The perched water and soil concentrations used in this calculation are included in Appendix F.3.II-A.

Table F.3.II-2 summarizes all the calculated K_l and K_d values. After reviewing the results, it was determined that there are two groups of K_l and K_d values which fall into two distinct ranges of values. Because of the different forms of uranium and geochemical conditions which exist in the Operable Unit 5 area (Lee and Marsh 1992), separate representative K_l and K_d values were estimated for these areas. Overall, two representative values corresponding to the two groups of calculated K_l and K_d values were developed for the production area. The geometric mean of all values calculated for wells in the area which have an ongoing source of soluble uranium to the media is 14 L/kg. The geometric mean of calculated values in the remaining part of the production area was 300 L/kg. Both of these two representative values are within the reported literature ranges summarized in Table F.3.II-1. Individually, the geometric mean for K_ls ranged from 14 L/kg (soluble area) to 325 L/kg (remaining area), while the geometric mean for K_ds ranged from 22 L/kg (soluble area) to 248 L/kg (remaining area). These values are also within the range of reported literature ranges summarized in Table F.3.II-1. The estimated K_l values of uranium are representative of source material and only the extractable portion of waste materials in the source areas.

557 Geochemical Programs: Issue 3 and Issue 5 Report (DOE 1993b) presented a range of uranium K_d values for the Great Miami Aquifer sand and gravel materials. One of the approaches used in the

001211

study was to calculate the ratios between soil and groundwater uranium concentrations taken from the same Great Miami Aquifer monitoring well location. Although soil and groundwater concentrations from various locations at the FEMP were evaluated in the study, the report only formally summarized a range of K_d values for the sand and gravel materials in the South Groundwater Contamination Plume area. A R_d of 12 was selected in subsequent solute transport model calibrations conducted for the South Plume using this range of K_d values (DOE 1993b). The K_d value corresponding to the calibrated retardation factor of 12 is about 1.78 L/kg. The relationship between R_d and K_d is described in Section F.3.II.1.1.3.

TCLP Results

TCLP tests were performed on surface soil samples collected from three Operable Unit 5 areas (i.e., incinerator, plant 1 pad, and the maintenance building). These leachate results were used in conjunction with the initial uranium concentrations in the soil samples to determine K_l values. The resulting K_ls are summarized in Tables F.3.II-3 through F.3.II-5. The soil sample locations are included in Figure F.3.II-2. As can be seen in the tables, results were available for numerous contaminants including radionuclides, inorganics, and organics; however, for this discussion only the total uranium and uranium isotope results are relevant. The uranium K_l results can be summarized as follows: for the incinerator area a representative K_l = 400 L/kg was calculated; a representative K_l = 39 L/kg was estimated for the Plant 1 pad area; and a representative K_l = 104 L/kg was determined for the maintenance building. The K_ls for the incinerator area and maintenance building are higher and would generally correspond to less soluble forms of uranium or a depleted source, while the K_l for the Plant 1 pad is lower and represents more soluble forms of uranium or an on-going source. It is also interesting to note from these tables that the K_l results for the uranium isotopes are usually quite close to the total uranium K_ls. These results help to confirm the assumption of using the same K_l or K_d values for all uranium isotopes.

Results from Laboratory Tests

Experimental results reported in an Oak Ridge National Laboratory (ORNL) study on the uranium contaminated surface soil from the production area at the FEMP indicate that the range of K_l is very large (Lee et al. 1993). This is because of different forms of uranium contaminants (i.e., liquid, particulate, and air deposition) and is consistent with the finding from the perched water wells. Among the two contaminated soil samples tested in the equilibration study, only insignificant amounts of uranium leached out from one soil sample, sample A-14, which has a significantly higher solid

phase concentration. In fact, this soil sample never reached an equilibrium condition in the 70-day duration of the test. More soluble uranium did leach out from the other soil sample, sample B-16. At the end of the test, this soil sample was close to equilibrium. Using the results of the B-16 soil sample, a K_l value of 31.45 L/kg was calculated.

Batch tests have been conducted to measure K_l and K_d of uranium in the waste materials, contaminated soil, and uncontaminated soil collected from Operable Unit 2 and Operable Unit 4 areas. Results of these tests show that K_l and K_d values of the waste materials, contaminated surface soil and glacial till are in the range of 30 L/kg and higher. Measured K_d results in the aquifer materials are usually lower than 10 L/kg. The experimental procedures and results of these batch tests are summarized in the Uranium Partition Coefficient Evaluation Study (DOE 1993g) for Operable Unit 2. Results of the Operable Unit 4 study are presented in Appendix F.3.II-B.

Similar tests on waste materials from the Operable Unit 5 source areas were part of the Operable Unit 5 FS Treatability Study. Operable Unit 5 conducted batch tests (desorption) on surface soil to determine K_l values. Eleven archived surface soil samples (i.e., samples taken from the top 6 inches of soil) for the Operable Unit 5 area, which were considered contaminated, were retrieved and used for the batch tests (desorption). The results of the test are presented in Table F.3.II-6. The locations of the soil samples used in the test are included in Figure F.3.II-2. The K_l values presented in Table F.3.II-6 range from 1870 L/kg (Plant 9) to 5.3 L/kg (graphite furnace area). These values fall within the range of literature values and other studies conducted at the FEMP. Results of the Operable Unit 5 study are presented in Appendix F.3.II-C.

F.3.II.3.1.2 Zonation and Values of Uranium K_l and K_d for Modeling

The actual zonation and values of uranium K_l and K_d are presented in this subsection.

Uranium Contaminated Sources

Uranium mass inventories, leachate concentrations, and loading terms used in previous modeling for Operable Unit 1 and Operable Unit 2 RIs will be directly imported into the Operable Unit 5 RI modeling. Therefore, geochemical parameters in these source areas remain the same as previously assigned. The uranium K_d value of 1.8 L/kg used in Operable Unit 4 will be revised according to the batch test results obtained after the Operable Unit 4 RI modeling was completed.

Geochemical parameters for additional uranium source areas defined in the Operable Unit 5 RI were determined by using area-specific uranium concentrations measured in insitu leachate, waste material, perched water, TCLP samples, and/or batch test results. Various release histories and forms of uranium in contaminant sources may result in different values of K_l and K_e in different source areas. For example, areas with soluble forms of uranium (e.g., Plant 2/3, Plant 6, Plant 9, etc.,) will be assigned a K_l value of 15 L/kg while uranium contaminated soil in the remaining production area will be assigned a K_l value of 222 L/kg. Based on the range of calculated values using measured concentrations and results of TCLP and batch tests, the 15 and 222 L/kg are selected as representative values for ongoing and depleted Operable Unit 5 sources. Delineation of Operable Unit 5 source areas and all the area-specific uranium K_l values is presented in Figure F.3.4-2 of Appendix F.3. In general, the ongoing source areas contain more soluble forms of uranium while depleted source areas contain mainly less soluble forms of uranium.

Glacial Overburden and Unsaturated Great Miami Aquifer

Although covering a smaller range, uranium K_d values in the glacial overburden have a very similar distribution like the source K_l values. At least two types of uranium forms (i.e., soluble and non-soluble) and therefore two groups of uranium source areas (i.e., ongoing and depleted) need to be modeled with two different K_d values in the glacial overburden.

To simplify the RI baseline fate and transport modeling, uranium K_d in the glacial overburden is assumed to have the same value as the source K_l. This assumption is also used to represent two different types of contaminant sources (i.e., ongoing and depleted) described in Attachment F.3.I. For example, areas with soluble forms of uranium will be assigned a K_d value of 15 L/kg while uranium contaminated soil in the remaining source area will be assigned a K_d value of 222 L/kg. In reality the 15 and 222 L/kg values are more representative for K_d than for the K_l. The K_l values can be much higher in the depleted source areas. In order to use the same value for both K_l and K_d in modeling, the representative values for K_d which are lower than K_l are used for both parameters. Therefore, Figure F.3.4-2 also shows the zones of K_d values.

The uncertainty analysis in the Operable Unit 5 RI Report will also evaluate other conditions regarding the source types and distribution of K_d value in the glacial overburden to bound the potential ranges of future impacts to the receptors.

The unsaturated portion of the Great Miami Aquifer is conservatively assumed to have the same uniform K_d as the saturated Great Miami Aquifer which has a K_d of 1.78 L/kg. As mentioned earlier, this value was determined through solute transport model calibration in the South Plume area as part of the SWIFT Great Miami Aquifer model improvement process.

Saturated Great Miami Aquifer

Because only the soluble forms of uranium can reach the Great Miami Aquifer in significant quantity, K_d values in the Great Miami Aquifer are lower and more homogeneous than the glacial overburden and source areas. Complex zonation of uranium K_d values in the Great Miami Aquifer is therefore not necessary. Uranium K_d in the saturated Great Miami Aquifer is determined through the solute transport model recalibration task in the groundwater model improvement process. The calibration target is the geostatistically defined 1990 uranium concentrations in the Great Miami Aquifer (DOE 1993f). Both the dissolved concentration and total mass of uranium in the Great Miami Aquifer were matched to select the final uranium K_d zonation and values. Based on the spatial trend of available uranium K_d values in the saturated Great Miami Aquifer, a simple zonation approach with a higher K_d value to the north and a lower K_d value to the south covering the South Plume area was tested in the calibration. The final uniform K_d value selected for uranium in the Great Miami Aquifer is 1.78 L/kg.

F.3.II.3.2 PERCENT OF EXTRACTABLE URANIUM IN THE WASTE MATERIALS (K_e)

Although K_e was not used in Operable Unit 5 RI fate and transport modeling, available information and reasonable estimations regarding K_e are still summarized here.

F.3.II.3.2.1 Available Information

Available sources of information for percent of extractable uranium used include the ORNL soil characterization and washing study (Lee and Marsh 1992) and Operable Unit 2 batch tests (DOE 1993g). Based on results of these studies, uranium mass in waste material or contaminated soil at the FEMP is usually not completely extractable by rainwater. It has been found that the percent of extractable uranium in untreated FEMP waste materials with 2500 μg/g or lower total uranium concentrations is usually below 30 percent by acid extractants. For waste materials with 300 μg/g or less total uranium, the percent of extractable uranium by rainwater is below 10 percent. For waste materials with 5000 μg/g or higher total uranium, the percent of extractable uranium can be higher than 40 percent by acid extractants.

F.3.II.3.2.2 Zonation and Values of Uranium K_e for Modeling

For the fate and transport modeling K_e will only be applied during the initial source term determination. Based on the soil treatability study, Operable Unit 2 batch tests, and current uranium concentrations in the Operable Unit 5 waste materials, the following two K_e values are selected for future modeling purposes:

- For source materials with solid phase total uranium concentrations less than or equal to 2500 μg/g, the K_e is assumed to be 30 percent.
- For source materials with solid phase total uranium concentrations higher than 2500 μg/g, the K_e is assumed to be 50 percent.

Accordingly, the zonation of uranium K_e is defined by the current concentrations of uranium in the waste material or contaminated soil.

F.3.II.3.3 SCREENING MODEL CONFIRMATION FOR URANIUM K_l, K_d AND K_e

The ECTran screening-level fate and transport model (DOE, 1993c) was used to confirm that the estimated K_l, K_d and K_e of uranium are reasonable and can result in the current uranium concentrations in the perched water and/or the Great Miami Aquifer. The R_d is not evaluated because ECTran does not directly use R_d for simulating contaminant migration. The confirmation procedure involved: 1) defining the existing hydrogeological conditions and the extent of the source area; 2) inputing an estimated source leachate concentration; 3) obtaining the model's results for concentration in the Great Miami Aquifer after the estimated time since the first release of contaminant from the source; 4) comparing the results with available measured results; and 5) confirming the total solid phase concentrations (calculated using the source leachate concentration, K_l, K_d, and K_e) with the measured soil concentrations.

Two contaminated sites in the former production area were investigated in the vicinity of Plant 2/3 and Plant 6. These sites have well-defined, ongoing sources with soluble forms of uranium and the modeling approach is generally straightforward and will be described below. In addition, an area to the southeast of the production area, where two lysimeters (11130 and 11131) were used to collect insitu leachate samples, was also investigated (see Figure F.3.II-3). This area does have a poorly defined source and the modeling approach is slightly more complicated and will be discussed separately from the other two sites. Additional lysimeter samples were also collected in locations north (11132 and 11133) and southwest (11129 and 11234) of the production area (see

Figure F.3.II-3). These areas have relatively well-defined uranium sources and were not considered for the confirmation task because they can be represented by the results from the Plant 2/3 and Plant 6 cases.

Plant 2/3 and Plant 6 Confirmation

For the two contaminated sites in the production area representative source leachate concentrations were estimated using the maximum annual average Type 1 wells total uranium concentrations in 1990. Uranium source leachate concentrations of 78.3 mg/L (from Well 1214) and 166.7 mg/L (from Well 1149) were assigned for Plant 2/3 and Plant 6 source areas, respectively. Area-weighted average perched water concentrations in both areas are more than one order of magnitude lower than these maximum concentrations. Representative values for all the other hydrogeological parameters for these areas were also assigned. The major parameter values used for the confirmation modeling are summarized in Table F.3.II-7.

Two ECTran model outputs are presented in Tables F.3.II-8 and F.3.II-9 for Plant 2/3 and Plant 6, respectively. The comparisons between modeled and measured groundwater concentrations are summarized in Table F.3.II-10. From these results it can be seen that the modeled overburden and Great Miami Aquifer results compared very well with the average measured concentrations.

When the source leachate concentrations were converted into the total solid phase concentrations, using the K_1 value of 15 L/kg and percent extractable uranium of 50 percent, the results are about 2500 and 5000 mg/kg for the Plant 2/3 and Plant 6 areas, respectively. These solid phase concentrations are consistent with the ranges of measured maximum soil conditions in these areas.

These two source areas represent the most significant sources of uranium contamination that can directly impact the Great Miami Aquifer. Since the confirmation modeling indicates that the values of geochemical parameters assigned for these areas are reasonable, the maximum loading from the production area and subsequent impacts to the Great Miami Aquifer receptors simulated in the Operable Unit 5 RI baseline fate and transport modeling for the groundwater pathway will be reasonable.

Lysimeter Confirmation

As discussed earlier, the contaminant source for the southeast area where the lysimeters were installed is poorly defined (in terms of release history and the forms of uranium) and an uncertainty analysis using ECTran was necessary to evaluate the geochemical parameters and release scenarios. The approach used in the confirmation modeling was to investigate two source types, a continuous source and limited short-term source, to determine the appropriate range of geochemical parameter values.

For the first scenario, two ECTran runs were completed for a continuous uranium source. The first run was conducted to estimate the expected average perched groundwater concentration in the gray clay and the second run was completed to confirm the geochemical parameters which affect the leachate concentration in the unsaturated Great Miami Aquifer measured in the deeper lysimeter. The input data for these two ECTran model runs are presented in Table F.3.II-11. A constant source leachate concentration of 135 μg/L was used for the modeling.

Assumptions used to conduct the modeling include:

- Surface infiltration rate over the depression area is about 8.4 inches per year
- The effective barrier layer (i.e., gray clay) is about 10 feet thick
- The overall average surface soil uranium concentration in the vicinity of the depression area is about 20 to 25 mg/kg
- The more soluble uranium accounts for about 10 to 20 percent of the total surface soil uranium concentration in the vicinity of the lysimeters
- Due to the distribution of the stepping sand lenses as seen in surrounding soil borings, the deeper lysimeter may be located closer to a preferential downward migration route than the shallower lysimeter, and therefore can have a higher concentration than the shallower lysimeter.

The results of the modeling are summarized in several tables. Tables F.3.II-12 and F.3.II-13 show the ECTran model output. Table F.3.II-14 presents a summary of the modeling results and compares them with measured data. Figures F.3.II-4 and F.3.II-5 present the layer-specific concentration curves versus time for the two runs. The magnitude of the modeling results are in reasonable agreement (within an order of magnitude) for the perched water and in very good agreement (12 μg/L vs. 12 μg/L) for the unsaturated sand and gravel. Although conservative, this scenario is considered

not very realistic because a large amount of uranium is required to maintain the assumed continuous source.

For the short-term loading scenario a more intense loading concentration (300 μg/L) was used for a five-year loading period and then the soluble source is assumed to be depleted. This loading is used to represent the soluble uranium contamination released from the production area in the 1950s and subsequently migrated through the overburden with the surface infiltration. It is assumed that current soil contamination in the vicinity of the southeast lysimeters contains less soluble uranium and can be considered a depleted source. Input data for this simulation is summarized in Table F.3.II-15. The results of this run are presented in Tables F.3.II-16 and F.3.II-17. Figure F.3.II-6 presents the layer-specific concentration curves versus time for the two runs. The magnitude of the modeling results are in very good agreement (within the range of perched water measurements) for the perched water and in very good agreement (10.4 μg/L vs. 12 μg/L) for the unsaturated sand and gravel. In addition, the concentration versus time curves follow the pattern expected according to the geochemical concepts of the uranium distribution discussed in Attachment F.3.I. The curves show that at approximately 30 years the shallower lysimeter concentration is less than the deeper lysimeter concentration. However, a lower K_d value (i.e., 4 L/kg) is required in this simulation. This K_d value is still in the range of field measured values.

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TABLE F.3.II-1

SUMMARY OF LITERATURE K_d VALUES OF URANIUM

Soil Type	Exp(u) (L/kg)	Range (L/kg)	Reference
Clay	1600	46 - 395100	Thibault et al., 1990
Silt	15	0.20 - 4500	Thibault et al., 1990
Sand	35	0.03 - 2200	Thibault et al., 1990
Agricultural Soils and Clay	450	N/A	Baes et al., 1984
Agricultural Soils	45	10.5 - 4400	Baes and Sharp, 1983

N/A - Not Applicable

TABLE F.3.II-2

SUMMARY OF CALCULATED K_l AND K_d (L/kg) VALUES FOR URANIUM FOR FEMP

Remaining Production Area		Source Areas with Soluble Uranium	
Well No.	Corrected Value	Well No.	Corrected Value
1167	922.30	1131	95.70
1181	164.87	1154	29.39
1198	106.76	1179	15.22
1244	945.89	1180	13.38
1245	127.63	1182	11.16
1246	3558.38	1183	20.16
1277	87.59	1185	45.35
1280	456.07	1186	1.89
1281	107.01	1187	76.04
1287	150.27	1194	26.35
1338	1743.80	1195	3.47
1347	123.22	1196	10.12
1356	263.38	1199	29.34
1443	1141.08	1200	12.36
1448	332.65	1201	66.56
1513	169.31	1202	41.90
1515	314.35	1203	835.02
1267*	148.17	1204	13.31
1348*	182.75	1205	20.41
1354*	74.90	1206	6.71
1360*	850.47	1207	25.29
1266*	2432.53	1209	1.61
1317*	140.06	1212	8.22
1341*	98.99	1213	3.38
		1214	214.90
		1215	21.56
		1216	23.33
		1217	12.60

TABLE F.3.II-2 (Continued)

Remaining Production Area			Source Areas with Soluble Uranium				
Well No.		Corrected Value	Well No.	Corrected Value			
Overall:	Arithmetic Mean:	610.10	1219	9.39			
	Geometric Mean:	300.669	1220	13.11			
			1221	22.79			
K_d:	Arithmetic Mean:	561.12	1224	4.06			
	Geometric Mean:	248.291	1231	3.34			
			1232	6.22			
K_l:	Arithmetic Mean:	630.27	1233	1.52			
	Geometric Mean:	325.326	1236	21.71			
			1240	14.02			
			1271	17.29			
			1145	2.13			
			1148	34.03			
			1149	10.47			
			1151	20.88			
			1324	0.59	Overall:	Arithmetic Mean:	40.11
			1339	7.42		Geometric Mean:	14.42
			1441	2.53			
			1447	11.69	K_d:	Arithmetic Mean:	24.24
			1509	30.29		Geometric Mean:	22.10
			1510	54.48			
			1225*	28.59	K_l:	Arithmetic Mean:	41.10
			1230*	11.62		Geometric Mean:	14.04
			1250*	32.49			

* = K_d values, the remaining values are K_ls.

TABLE F.3.II-3

SUMMARY FOR CALCULATED K_1 (L/kg) VALUES FOR ID-A INCINERATOR USING TCLP DATA

Chemical	Sample 100279	Sample 100280	Sample 100281	Sample 100282	Avg.	OU5-RI K_1 Value
Radionuclides						
Neptunium 237	1643	647	3000	1143	1608.25	55
Uranium (total)	467	360	514	254	398.75	222
Uranium 234	594	353	682	255	471	222
Uranium 235/236	756	583	1657	538	883.5	222
Uranium 238	588	326	696	271	470.25	222
Inorganics						
Aluminum	3350	5886	59437	6726	18849.8	1500
Antimony	NA	NA	159.7	NA	159.7	250
Barium	17.93	25.04	200.8	27.12	67.7225	1140
Beryllium	666	NA	NA	NA	666	1300
Boron	0.405	1.236	26.53	1.05	7.30525	3
Cadmium	322	300	400	221	310.75	500
Calcium	20.82	29.92	30.39	13.73	23.715	50
Chromium	1588	2304	7350	3183	3606.25	1500
Iron	91429	124626	2.47×10^5	2.64×10^5	181764	165
Lead	2288	NA	1888	2276	2150.67	3000
Magnesium	65.46	75.87	100.2	80.91	80.61	4.5
Manganese	1836	2724	1942	1009	1877.75	180
Nickel	1126	1547	1013	1042	1182	650
Potassium	125.7	197	728	216	316.675	75
Silicon	215	332	249	193	247.25	NA
Sodium	0.036	0.039	4.09×10^{-4}	3.60×10^{-4}	0.01894	100
Zinc	21.58	24.26	499	24.87	142.428	2400

NA - Not Applicable

TABLE F.3.II-4

SUMMARY OF K_l (L/kg) VALUES FOR ID-B PLANT 1 PAD USING TCLP DATA

Chemical	Sample 100272	Sample 100274	Sample 100275	Sample 100276	Avg.	OU5-RI K_l Value
Radionuclides						
Neptunium 237	45.16	54.5	54.5	54.5	52.165	55
Radium 228	734	973	973	973	913.25	696
Technetium 99	268	567	567	567	492.25	0.118
Uranium (total)	37.5	38.9	38.9	38.9	38.55	222
Uranium 234	44.7	48.5	48.5	48.5	47.55	222
Uranium 235/236	23	42.7	42.8	42.7	37.8	222
Uranium 238	42.8	48.6	48.6	48.7	47.175	222
Inorganics						
Aluminum	28000	37861	36499	37449	34952.3	1500
Barium	52.7	70.9	62.6	55.17	60.3425	1140
Calcium	77.9	101	100.9	96.2	94	50
Iron	6.93×10^5	5.50×10^5	2.95×10^5	4.21×10^5	489750	165
Lead	451	438	302	221	353	3000
Magnesium	830	840	914	891	868.75	4.5
Manganese	470	559	591	512	533	180
Nickel	1808	1717	1888	2750	2040.75	650
Potassium	406	417	766	765.9	588.725	75
Silver	56.1	NA	NA	NA	56.1	180
Zinc	67.2	113	71.4	69.2	80.2	2400

NA - Not Applicable

TABLE F.3.II-5

SUMMARY OF CALCULATED K_l (L/kg) VALUES FOR OU5-A MAINTENANCE BUILDING USING TCLP DATA

Chemical	Sample 075631	Sample 075632	Sample 075633	Sample 075634	Avg.	OU5-RI K_l Value
Radionuclides						
Thorium (total)	NA	NA	2.31	NA	2.31	5800
Uranium (total)	152.2	44.7	107.5	111.1	103.875	222
Uranium 234	120.8	89.6	91.3	113.3	103.75	222
Uranium 235/236	75.2	91.1	77.7	70.7	78.675	222
Uranium 238	98.5	90.1	76.6	109.3	93.625	222
Inorganics						
Aluminum	6034	7264	6373	4575	6061.5	1500
Barium	70.4	103.2	66.8	75.8	79.05	1140
Copper	NA	NA	NA	2590	2590	125
Iron	29000	51500	43000	14200	34425	165
Lead	3013	2785	2757	2177	2683	3000
Magnesium	784	928	697	789	799.5	4.5
Manganese	68.6	99.6	59.4	68.8	74.1	180
Nickel	471	456	489	502.7	479.675	650
Potassium	450	445	499	340.6	433.65	75
Silicon	114	99.5	122	128.9	116.1	NA
Sodium	45.9	41.2	46.1	44.6	44.45	100
Zinc	317.6	293.2	245.1	290.2	286.525	2400
Organics						
1,2-Dichloroethene	6500	5500	6000	4000	5500	30.2
1,1,1-Trichlroethane	3000	NA	NA	NA	3000	295
Acetone	NA	NA	NA	100	100	0.57
Methylene Chloride	83.3	189.7	15000	101.3	3843.58	17.8
Tetrachloroethene	8000	9000	24140	8000	12285	339
Trichloroethene	7460	5500	46923	8462	17086.3	339
Toluene	NA	NA	21430	NA	21430	490
Phenanthrene	40	NA	NA	NA	40	29000

NA - Not Applicable

TABLE F.3.II-6

SUMMARY OF ESTIMATED TOTAL URANIUM K_Is FROM OPERABLE UNIT 5 BATCH TESTS

Sample Number and Location	Initial Total Uranium Concentration In Soil, C_o (mg/kg)	Estimated Total Uranium K_I (L/kg)
AS-1 (Plant 9)	192	1870
AS-2 (Plant 2/3)	256	149
AS-3 (Plant 6)	1500	13.3
AS-4 (Pilot Plant)	75.4	9.2
AS-5 (Graphite Furnace)	87.9	5.3
AS-6 (Paddys Run)	27.9	358
AS-7 (South of KC-2 Warehouse)	50.3	147
AS-8 (D&D Facility)	49.7	37.3
AS-9 (East of Building 77/79)	54.3	209
IDA (Incinerator)	502	240
IDB (Plant 1 Pad)	539	31.8

TABLE F.3.II-7

SUMMARY OF MAJOR PARAMETERS IN THE PLANT 2/3 AND PLANT 6 CONFIRMATION MODELS

Model Parameters	Plant 2/3 Area	Plant 6 Area
Source Loading Area Size (ft x ft)	500 x 500	500 x 500
Glacial Overburden (i.e., gray clay) Thickness (ft)	17	17
Unsaturated Sand and Gravel Thickness (ft)	35	35
Infiltration Rate (in/yr)	3	4.5
Constant Source Leachate Concentration (mg/L)	78.3	166.7
Years of Source Loading Before 1990 (years)	35	30
Distance to the Fence Line (ft)	3600	2000
GMA Groundwater Flow Velocity (ft/yr)	348	348

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TABLE F.3.II-8 ECTRAN OUTPUT FOR PLANT 2/3 CONFIRMATION MODELING

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SCREENING-LEVEL EXCEL-CRYSTAL BALL TRANSPORT (ECTran) MODEL

SITE:	PRODUCTION AREA, Kd TEST	CONTAMINANT: U238		SPECIFIC ACTIVITY:	3.35E-07
	PLANT 2/3 AREA	KOC (L/KG):	0.00	WATER CRITERIA (UG/L):	2.98E+00
	CURRENT CONDITION	HALF LIFE (YRS):		LEACHATE CONC. (UG/L)	7.83E+04
		LAYER 1:	4.47E+09	SOURCE LEACHATE Kd (L/KG):	1.60E+01
INVESTIGATOR:	JDC	LAYER 2:	4.47E+09	INITIAL LAYER 1 SOIL CONC. (MG/KG):	0.00E+00
DATE:	11.21/93	GMA:	4.47E+09	INITIAL LAYER 2 SOIL CONC. (MG/KG):	0.00E+00

UNSAT. SOURCE AREA:		LAYER 1 (GLACIAL OVERBURDEN)		LAYER 2 (SAND & GRAVEL)		GREAT MIAMI AQUIFER (SAT. S. & G.)			
						B (FT):	04	Vzo (FT/YR):	0.3899
LENGTH (FT):	500	FOC (KG/KG):	0.005	FOC (KG/KG):	0.0050	GW Q3 (L/DAY):	5.15E+04	FOC (KG/KG):	0.01
WIDTH (FT):	500	Kd (L/KG):	15.00	Kd (L/KG):	1.480	GW V.(FT/YR):	348.20	Kd (L/KG):	1.48
POROSITY 1:	0.34	SATURATION:	0.80	SATURATION:	0.25	H (FT):	12.7100	RETARDATION:	9.781333
POROSITY 2:	0.39	THICKNESS (FT):	17.00	THICKNESS (FT):	35.00	EFF. POROSITY:	0.30	q (FT/YR) :	0
DENSITY 1 (G/CM3):	1.78	DECAY (1/DAY):	4.25E-13	DECAY (1/DAY):	4.25E-13	DISPERSIVITY:		DECAY (1/YR):	1 oE-10
DENSITY 2 (G/CM3):	1.78	CAo (UG/L):	0.00E+00	CBo (PPB):	0.00E+00	Az(FT):	0.67	CU3 (PPB):	0
INFILT. (FT/YR):	0.25	CU1 (PPB):	78278	CU2 (PPB):	0.00E+00	Ax (FT):	100.00	P&T(YEARS):	0
AGE (YEARS):	0	Q1 (L/DAY):	4.85E+03	Q2 (L/DAY):	0.00E+00	Ay (FT):	33.33	DISTANCE TO F.L.(FT):	3600

TIME INTERVAL (YRS)	1	LAYER 1 LEACHATE CONC.	LAYER 2 LEACHATE CONC.	SOURCE AREA CONC.	FENCE LINE CONC.
ELAPSED TIME - YRS	DAYS	(UG/L)	(UG/L)	(UG/L)	(UG/L)
0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	365	4.27E+01	5.58E-02	5.25E-03	0.00E+00
2	730	8.54E+01	2.23E-01	2.10E-02	0.00E+00
3	1095	1.28E+02	5.01E-01	4.72E-02	0.00E+00
4	1460	1.71E+02	8 90E-01	8.38E-02	0.00E+00
5	1825	2.13E+02	1.39E-00	1.31E-01	0.00E+00
o	2190	2.56E+02	2.00E-00	1.88E-01	0.00E+00
7	2555	2.98E+02	2.72E-00	2.56E-01	0.00E+00
8	2920	3.41E+02	3 54E-00	3.34E-01	0.00E+00
9	3285	3.83E+02	4 48E-00	4.22E-01	0.00E+00
10	3650	4.26E+02	5 53E-00	5.20E-01	0.00E+00
11	4015	4.68E+02	o o8E-00	6.29E-01	0.00E+00
12	4380	5.11E+02	7 94E-00	7.48E-01	0.00E+00
13	4745	5.53E+02	9.31E-00	8.77E-01	0.00E+00
14	5110	5.96E+02	1 08E-01	1.02E+00	0.00E+00
15	5475	6.38E+02	1.24E-01	1.16E+00	0.00E+00
16	5840	6.80E+02	1 41E-01	1.32E+00	0.00E+00
17	6205	7.23E+02	1 59E-01	1.49E+00	0.00E+00
18	6570	7.65E+02	1 78E-01	1.67E+00	0.00E+00
19	6935	8.07E+02	1 98E-01	1.86E+00	1.14E-19
20	7300	8.49E+02	2.19E-01	2.06E+00	2.28E-18
21	7665	8.92E+02	2 41E-01	2.27E+00	2.64E-17
22	8030	9 34E+02	2 64E-01	2.49E+00	2.36E-16
23	8395	9.76E+02	2 88E-01	2.72E+00	1.74E-15
24	8760	1.02E+03	3 14E-01	2.95E+00	1.08E-14
25	9125	1.06E+03	3 40E-01	3.20E+00	5.80E-14
26	9490	1.10E+03	3 67E-01	3.46E+00	2.73E-13
27	9855	1.14E+03	3 96E-01	3.73E+00	1.15E-12
28	10220	1.19E+03	4 25E-01	4.00E+00	4.34E-12
29	10585	1.23E+03	4 56E-01	4.29E+00	1.50E-11
30	10950	1.27E+03	4 87E-01	4.59E+00	4.76E-11
31	11315	1.31E+03	5 20E-01	4.89E+00	1.40E-10
32	11680	1.35E+03	5 53E-01	5.21E+00	3.87E-10
33	12045	1.40E+03	5 88E-01	5.53E+00	1.00E-09
34	12410	1.44E+03	6 23E-01	5 87E+00	2.45E-09
35	12775	1 48E+03	6 60E-01	6.21E+00	5.69E-09
36	13140	1.52E+03	6 97E-01	6.56E+00	1.26E-08
37	13505	1.56E+03	7 36E-01	6.93E+00	2.68E-08
38	13870	1.61E+03	7 75E-01	7.30E+00	5.45E-08
39	14235	1.65E+03	8 16E-01	7 68E+00	1.07E-07
40	14600	1.69E+03	8 57E-01	8.07E+00	2.03E-07
41	14965	1.73E+03	8 99E-01	8.47E+00	3.73E-07
42	15330	1 77E+03	9 43E-01	8 88E+00	6.65E-07
43	15695	1.81E+03	9 87E-01	9 30E+00	1.15E-06
44	16060	1 86E+03	1 03E-02	9.72E+00	1.95E-06
45	16425	1 90E+03	1 08E-02	1.02E+01	3.22E-06
46	16790	1.94E+03	1 13E-02	1.06E+01	5.20E-06
47	17155	1 98E+03	1 17E-02	1.11E+01	8.22E-06
48	17520	2.02E+03	1 22E-02	1.15E+01	1.27E-05
49	17885	2.06E+03	1 27E-02	1.20E+01	1.94E-05
50	18250	2.11E+03	1 33E-02	1.25E+01	2.89E-05
MAXIMUM:		2.11E+03	1 33E-02	1.25E+01	2.89E-05

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TABLE F.3.II-9 ECTRAN OUTPUT FOR PLANT 6 CONFIRMATION MODELING

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BROWN & ROOT ENVIRONMENTAL

SCREENING-LEVEL EXCEL-CRYSTAL BALL TRANSPORT (ECTran) MODEL

SITE:	PRODUCTION AREA, Kd TEST	CONTAMINANT: U238		SPECIFIC ACTIVITY:	3.35E-07
	PLANT 6 AREA	KOC (L/KG):	0.00	WATER CRITERIA (UG/L):	2.98E+00
	CURRENT CONDITION	HALF LIFE (YRS):		LEACHATE CONC. (UG/L)	1.67E+05
		LAYER 1:	4.47E+09	SOURCE LEACHATE Kd (L/KG):	1.60E+01
INVESTIGATOR:	JDC	LAYER 2:	4.47E+09	INITIAL LAYER 1 SOIL CONC. (MG/KG):	0.00E+00
DATE:	11/21/93	GMA:	4.47E+09	INITIAL LAYER 2 SOIL CONC. (MG/KG):	0.00E+00

UNSAT. SOURCE AREA:		LAYER 1 (GLACIAL OVERBURDEN)		LAYER 2 (SAND & GRAVEL)		GREAT MIAMI AQUIFER (SAT. S. & G.)			
						B (FT):	64	Vzo (FT/YR):	0.3899
LENGTH (FT):	500	FOC (KG/KG):	0.005	FOC (KG/KG):	0.0050	GW Q3 (L/DAY):	5.15E+04	FOC (KG/KG):	0.01
WIDTH (FT):	500	Kd (L/KG):	15.00	Kd (L/KG):	1.480	GW V.(FT/YR):	348.20	Kd (L/KG):	1.48
POROSITY 1:	0.34	SATURATION:	0.80	SATURATION:	0.25	H (FT):	12.7100	RETARDATION:	9.781333
POROSITY 2:	0.39	THICKNESS (FT):	17.00	THICKNESS (FT):	35.00	EFF. POROSITY:	0.30	q (FT/YR):	0
DENSITY 1 (G/CM3):	1.78	DECAY (1/DAY):	4.25E-13	DECAY (1/DAY):	4.25E-13	DISPERSIVITY:		DECAY (1/YR):	1.6E-10
DENSITY 2 (G/CM3):	1.78	CAo (UG/L):	0.00E+00	CBo (PPB):	0.00E+00	Az(FT):	0.67	CU3 (PPB):	0
INFILT. (FT/YR):	0.375	CU1 (PPB):	166666.7	CU2 (PPB):	0.00E+00	Ax (FT):	100.00	P&T(YEARS):	0
AGE (YEARS):	0	Q1 (L/DAY):	7.27E+03	Q2 (L/DAY):	0.00E+00	Ay (FT):	33.33	DISTANCE TO F.L.(FT):	2000

TIME INTERVAL (YRS)	1	LAYER 1 LEACHATE CONC.	LAYER 2 LEACHATE CONC.	SOURCE AREA CONC.	FENCE LINE CONC.
ELAPSED TIME - YRS	DAYS	(UG/L)	(UG/L)	(UG/L)	(UG/L)
0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	365	1.36E+02	2.67E-01	3.77E-02	0.00E+00
2	730	2.73E+02	1.07E+00	1.51E-01	0.00E+00
3	1095	4.09E+02	2.40E+00	3.38E-01	0.00E+00
4	1460	5.45E+02	4.25E+00	6.01E-01	0.00E+00
5	1825	6.81E+02	6.64E+00	9.37E-01	0.00E+00
6	2190	8.16E+02	9.54E+00	1.35E+00	0.00E+00
7	2555	9.52E+02	1.30E+01	1.83E+00	0.00E+00
8	2920	1.09E+03	1.69E+01	2.39E+00	4.24E-17
9	3285	1.22E+03	2.14E+01	3.02E+00	6.46E-15
10	3650	1.36E+03	2.63E+01	3.72E+00	3.29E-13
11	4015	1.49E+03	3.18E+01	4.49E+00	7.85E-12
12	4380	1.63E+03	3.78E+01	5.34E+00	1.09E-10
13	4745	1.76E+03	4.43E+01	6.26E+00	1.00E-09
14	5110	1.90E+03	5.13E+01	7.25E+00	6.76E-09
15	5475	2.03E+03	5.88E+01	8.30E+00	3.55E-08
16	5840	2.17E+03	6.68E+01	9.43E+00	1.52E-07
17	6205	2.30E+03	7.53E+01	1.06E+01	5.53E-07
18	6570	2.44E+03	8.43E+01	1.19E+01	1.75E-06
19	6935	2.57E+03	9.38E+01	1.32E+01	4.92E-06
20	7300	2.71E+03	1.04E+02	1.46E+01	1.25E-05
21	7665	2.84E+03	1.14E+02	1.61E+01	2.93E-05
22	8030	2.97E+03	1.25E+02	1.77E+01	6.35E-05
23	8395	3.11E+03	1.37E+02	1.93E+01	1.29E-04
24	8760	3.24E+03	1.48E+02	2.10E+01	2.48E-04
25	9125	3.37E+03	1.61E+02	2.27E+01	4.53E-04
26	9490	3.51E+03	1.74E+02	2.45E+01	7.92E-04
27	9855	3.64E+03	1.87E+02	2.64E+01	1.33E-03
28	10220	3.78E+03	2.01E+02	2.84E+01	2.16E-03
29	10585	3.91E+03	2.15E+02	3.04E+01	3.38E-03
30	10950	4.04E+03	2.30E+02	3.24E+01	5.15E-03
31	11315	4.17E+03	2.45E+02	3.46E+01	7.65E-03
32	11680	4.31E+03	2.61E+02	3.68E+01	1.11E-02
33	12045	4.44E+03	2.77E+02	3.91E+01	1.57E-02
34	12410	4.57E+03	2.93E+02	4.14E+01	2.19E-02
35	12775	4.71E+03	3.10E+02	4.38E+01	2.99E-02
36	13140	4.84E+03	3.28E+02	4.63E+01	4.01E-02
37	13505	4.97E+03	3.46E+02	4.88E+01	5.31E-02
38	13870	5.10E+03	3.64E+02	5.14E+01	6.92E-02
39	14235	5.23E+03	3.83E+02	5.41E+01	8.90E-02
40	14600	5.37E+03	4.02E+02	5.68E+01	1.13E-01
41	14965	5.50E+03	4.22E+02	5.96E+01	1.42E-01
42	15330	5.63E+03	4.42E+02	6.24E+01	1.77E-01
43	15695	5.76E+03	4.63E+02	6.53E+01	2.18E-01
44	16060	5.89E+03	4.84E+02	6.83E+01	2.65E-01
45	16425	6.03E+03	5.05E+02	7.13E+01	3.21E-01
46	16790	6.16E+03	5.27E+02	7.44E+01	3.85E-01
47	17155	6.29E+03	5.49E+02	7.76E+01	4.59E-01
48	17520	6.42E+03	5.72E+02	8.08E+01	5.42E-01
49	17885	6.55E+03	5.95E+02	8.40E+01	6.37E-01
50	18250	6.68E+03	6.19E+02	8.74E+01	7.43E-01
MAXIMUM:		6.68E+03	6.19E+02	8.74E+01	7.43E-01

TABLE F.3.II-10

COMPARISONS OF MODELED AND MEASURED CONCENTRATIONS FOR PLANT 2/3 AND PLANT 6

Source Area	Performance Measures	Concentration (μg/L)
Plant 2/3	Modeled Perched water Concentration (35th Year)	1,480
	Range of Measured Perched Water Concentration (1990)	20 - 78,278
	Modeled GMA Concentration (35th Year)	6.21
	Average GMA 2000-Series Well Concentration (1990)[a]	5.05
	Range of GMA Concentration (1990)	3.3 - 6.8
Plant 6	Modeled Perched Water Concentration (30th Year)	4,040
	Range of Measured Perched Water Concentration (1990)	22 - 166,700
	Modeled GMA Concentration (30th Year)	32.4
	Average GMA 2000-Series Well Concentration (1990)[b]	30.05
	Range of GMA Concentration (1990)	1.9 - 120

[a]Wells 2007 and 2006.
[b]Wells 2054, 2109, 2118, 2388, and 2389.

TABLE F.3.II-11

SUMMARY OF MAJOR PARAMETERS IN THE LYSIMETER CONSTANT SOURCE CONFIRMATION MODELS

Model Parameters	Lysimeter Test Well 11130
Source Loading Area Size (ft x ft)	125 x 125
Top Glacial Overburten (i.e., gray clay) Thickness (ft)	1
Top Glacial Overburten (i.e., gray clay) K_d (L/kg)	15
Infiltration Rate (in/yr)	8.4
Constant Source Leachate Concentration (mg/L)	0.135

Model Parameters	Lysimeter Test Well 11131
Source Loading Area Size (ft x ft)	125 x 125
Top Glacial Overburten (i.e., gray clay) Thickness (ft)	10
Top Glacial Overburten (i.e., gray clay) K_d (L/kg)	15
Top Unsaturated Sand and Gravel Thickness (ft)	1
Top Unsaturated Sand and Gravel K_d (L/kg)	1.78
Infiltration Rate (in/yr)	8.4
Constant Source Leachate Concentration (mg/L)	0.135

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TABLE F.3.II-12 ECTRAN OUTPUT FOR CONSTANT SOURCE, GLACIAL OVERBURDEN

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SCREENING-LEVEL EXCEL-CRYSTAL BALL TRANSPORT (ECTran) MODEL

SITE:	CRU5 FEMP
	CRU5 F.S.
	Layer 1
INVESTIGATOR:	WYU
DATE:	6/19/94

CONTAMINANT: U238		SPECIFIC ACTIVITY (Ci/g):	3.35E-07
KOC (L/KG):	0.00	WATER CRITERIA (UG/L):	2.00E+01
HALF LIFE (YRS):		SOURCE LEACHATE CONC.(UG/L)	1.35E+02
LAYER 1:	4.47E+09	SOURCE LEACHATE Kd (L/KG):	1.50E+01
LAYER 2:	4.47E+09	INITIAL LAYER 1 SOIL CONC. (MG/KG):	0.00E+00
GMA:	4.47E+09	INITIAL LAYER 2 SOIL CONC. (MG/KG):	0.00E+00

UNSAT. SOURCE AREA:		LAYER 1 (GLACIAL OVERBURDEN)		LAYER 2 (SAND & GRAVEL)		GREAT MIAMI AQUIFER (SAT. S. & G.)			
INFILT(FT/YR):	0.698	CU1(0) (PPB)	1.35E+02	CU2(0) (PPB):	0.00E+00	B (FT):	75	Vzo (FT/YR):	5.75
LENGTH (FT):	125	FOC (KG/KG):	0	FOC (KG/KG):	0.0000	GW Q3 (L/DAY)	8.12E+03	FOC (KG/KG):	0
WIDTH (FT):	125	Kd (L/KG):	15.00	Kd (L/KG):	1.780	GW V.(FT/YR):	365.00	Kd (L/KG):	1.78
POROSITY 1:	0.2	SATURATION:	1.00	SATURATION:	0.17	H (FT):	7.6444	RETARDATION:	11.08667
POROSITY 2:	0.3	THICKNESS (FT):	1.00	THICKNESS (FT):	10.00	EFF. POROSITY	0.30	q (FT/YR) :	0
DENSITY 1 (G/CM3):	1.78	DECAY (1/DAY):	4.25E-13	DECAY (1/DAY):	4.25E-13	DISPERSIVITY:		DECAY (1/YR):	1.6E-10
DENSITY 2 (G/CM3):	1.60	CAo (UG/L):	0.00E+00	CBo (PPB):	0.00E+00	Az(FT):	0.13	CU3 (PPB):	0
		D.F. 1 (1/YR):	0	D.F. 2 (1/YR):	0.010	Ax (FT):	160.00	P&T(YEARS):	0
AGE (YEARS):	0	Q1 (L/DAY):	8.46E+02	Q2 (L/DAY):	0.00E+00	Ay (FT):	53.33	DISTANCE TO F.L.(FT):	1600
		Ts 1 (YEARS):	50	Ts 2 (YEARS):	1000				

TIME INTERVAL (YRS) 1

ELAPSED TIME - YRS	CU1(PPB)	CU2(PPB)	LAYER 1 LEA. CONC. (UG/L)	LAYER 2 LEACHATE CONC. (UG/L)	SOURCE AREA CONC. (UG/L)	FENCE LINE CONC (UG/L)
0	1.35E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	1.35E+02	0.00E+00	3.46E+00	4.15E-02	4.33E-03	0.00E+00
2	1.35E+02	0.00E+00	6.83E+00	1.63E-01	1.70E-02	0.00E+00
3	1.35E+02	0.00E+00	1.01E+01	3.61E-01	3.77E-02	0.00E+00
4	1.35E+02	0.00E+00	1.33E+01	6.32E-01	6.59E-02	0.00E+00
5	1.35E+02	0.00E+00	1.64E+01	9.71E-01	1.01E-01	2.21E-16
6	1.35E+02	0.00E+00	1.95E+01	1.38E+00	1.43E-01	1.05E-13
7	1.35E+02	0.00E+00	2.24E+01	1.84E+00	1.92E-01	6.63E-12
8	1.35E+02	0.00E+00	2.53E+01	2.37E+00	2.47E-01	1.38E-10
9	1.35E+02	0.00E+00	2.81E+01	2.95E+00	3.07E-01	1.46E-09
10	1.35E+02	0.00E+00	3.09E+01	3.58E+00	3.73E-01	9.75E-09
11	1.35E+02	0.00E+00	3.35E+01	4.26E+00	4.44E-01	4.70E-08
12	1.35E+02	0.00E+00	3.61E+01	4.99E+00	5.20E-01	1.78E-07
13	1.35E+02	0.00E+00	3.87E+01	5.76E+00	6.00E-01	5.55E-07
14	1.35E+02	0.00E+00	4.11E+01	6.57E+00	6.85E-01	1.49E-06
15	1.35E+02	0.00E+00	4.35E+01	7.43E+00	7.74E-01	3.57E-06
16	1.35E+02	0.00E+00	4.59E+01	8.31E+00	8.67E-01	7.71E-06
17	1.35E+02	0.00E+00	4.82E+01	9.24E+00	9.63E-01	1.54E-05
18	1.35E+02	0.00E+00	5.04E+01	1.02E+01	1.06E+00	2.85E-05
19	1.35E+02	0.00E+00	5.26E+01	1.12E+01	1.16E+00	5.00E-05
20	1.35E+02	0.00E+00	5.47E+01	1.22E+01	1.27E+00	8.34E-05
21	1.35E+02	0.00E+00	5.67E+01	1.32E+01	1.38E+00	1.33E-04
22	1.35E+02	0.00E+00	5.87E+01	1.43E+01	1.49E+00	2.04E-04
23	1.35E+02	0.00E+00	6.07E+01	1.54E+01	1.60E+00	3.04E-04
24	1.35E+02	0.00E+00	6.26E+01	1.65E+01	1.72E+00	4.38E-04
25	1.35E+02	0.00E+00	6.45E+01	1.76E+01	1.83E+00	6.16E-04
26	1.35E+02	0.00E+00	6.63E+01	1.87E+01	1.95E+00	8.46E-04
27	1.35E+02	0.00E+00	6.80E+01	1.99E+01	2.07E+00	1.14E-03
28	1.35E+02	0.00E+00	6.97E+01	2.10E+01	2.19E+00	1.50E-03
29	1.35E+02	0.00E+00	7.14E+01	2.22E+01	2.32E+00	1.95E-03
30	1.35E+02	0.00E+00	7.30E+01	2.34E+01	2.44E+00	2.49E-03
31	1.35E+02	0.00E+00	7.46E+01	2.46E+01	2.57E+00	3.14E-03
32	1.35E+02	0.00E+00	7.62E+01	2.58E+01	2.69E+00	3.91E-03
33	1.35E+02	0.00E+00	7.77E+01	2.70E+01	2.82E+00	4.80E-03
34	1.35E+02	0.00E+00	7.92E+01	2.83E+01	2.95E+00	5.84E-03
35	1.35E+02	0.00E+00	8.06E+01	2.95E+01	3.07E+00	7.03E-03
36	1.35E+02	0.00E+00	8.20E+01	3.07E+01	3.20E+00	8.39E-03
37	1.35E+02	0.00E+00	8.33E+01	3.20E+01	3.33E+00	9.92E-03
38	1.35E+02	0.00E+00	8.47E+01	3.32E+01	3.46E+00	1.16E-02
39	1.35E+02	0.00E+00	8.60E+01	3.44E+01	3.59E+00	1.36E-02
40	1.35E+02	0.00E+00	8.72E+01	3.57E+01	3.72E+00	1.57E-02
41	1.35E+02	0.00E+00	8.84E+01	3.69E+01	3.85E+00	1.80E-02
42	1.35E+02	0.00E+00	8.96E+01	3.82E+01	3.98E+00	2.06E-02
43	1.35E+02	0.00E+00	9.08E+01	3.94E+01	4.11E+00	2.34E-02
44	1.35E+02	0.00E+00	9.19E+01	4.06E+01	4.24E+00	2.65E-02
45	1.35E+02	0.00E+00	9.30E+01	4.19E+01	4.36E+00	2.98E-02
46	1.35E+02	0.00E+00	9.41E+01	4.31E+01	4.49E+00	3.33E-02
47	1.35E+02	0.00E+00	9.52E+01	4.43E+01	4.62E+00	3.72E-02
48	1.35E+02	0.00E+00	9.62E+01	4.56E+01	4.75E+00	4.12E-02
49	1.35E+02	0.00E+00	9.72E+01	4.68E+01	4.87E+00	4.56E-02
50	1.35E+02	0.00E+00	9.81E+01	4.80E+01	5.00E+00	5.02E-02
MAXIMUM	1.35E+02	0.00E+00	9.81E+01	4.80E+01	5.00E+00	5.02E-02

UNITS	UG/L	MG/KG	pCi/L	pCi/g
PERCIPITATION CONC.	1.35E+02	2.03E+00	4.52E+01	6.78E-01
LAYER 1 CONC.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LAYER 2 CONC.	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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TABLE F.3.II-13 ECTRAN OUTPUT FOR CONSTANT SOURCE, SAND AND GRAVEL

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BROWN & ROOT ENVIRONMENTAL

SCREENING-LEVEL EXCEL-CRYSTAL BALL TRANSPORT (ECTran) MODEL

SITE:	CRU5 FEMP	CONTAMINANT: U238		SPECIFIC ACTIVITY (Ci/g):	3.35E-07
	CRU5 F.S.	KOC (L/KG):	0.00	WATER CRITERIA (UG/L):	2.00E+01
	Layer 2	HALF LIFE (YRS):		SOURCE LEACHATE CONC.(UG/L)	1.35E+02
		LAYER 1:	4.47E+09	SOURCE LEACHATE Kd (L/KG):	1.50E+01
INVESTIGATOR:	WYU	LAYER 2:	4.47E+09	INITIAL LAYER 1 SOIL CONC. (MG/KG):	0.00E+00
DATE:	6/19/94	GMA:	4.47E+09	INITIAL LAYER 2 SOIL CONC. (MG/KG):	0.00E+00

UNSAT. SOURCE	AREA:	LAYER 1 (GLACIAL OVERBURDEN)		LAYER 2 (SAND & GRAVEL)		GREAT MIAMI AQUIFER (SAT. S. & G.)			
INFILT(FT/YR):	0.698	CU1(0) (PPB)	1.35E+02	CU2(0) (PPB):	0.00E+00	B (FT):	75	Vzo (FT/YR):	5.75
LENGTH (FT):	125	FOC (KG/KG):	0	FOC (KG/KG):	0.0000	GW Q3 (L/DAY)	8.12E+03	FOC (KG/KG):	0
WIDTH (FT):	125	Kd (L/KG):	15.00	Kd (L/KG):	1.780	GW V.(FT/YR):	365.00	Kd (L/KG):	1.78
POROSITY 1:	0.2	SATURATION:	1.00	SATURATION:	0.17	H (FT):	7.6444	RETARDATION:	11.08667
POROSITY 2:	0.3	THICKNESS (FT):	10.00	THICKNESS (FT):	1.00	EFF. POROSITY	0.30	q (FT/YR):	0
DENSITY 1 (G/CM3):	1.78	DECAY (1/DAY):	4.25E-13	DECAY (1/DAY):	4.25E-13	DISPERSIVITY:		DECAY (1/YR):	1.6E-10
DENSITY 2 (G/CM3):	1.60	CAo (UG/L):	0.00E+00	CBo (PPB):	0.00E+00	Az(FT):	0.13	CU3 (PPB):	0
		D.F. 1 (1/YR):	0	D.F. 2 (1/YR):	0.010	Ax (FT):	160.00	P&T(YEARS):	0
AGE (YEARS):	0	Q1 (L/DAY):	8.46E+02	Q2 (L/DAY):	0.00E+00	Ay (FT):	53.33	DISTANCE TO F.L.(FT):	1600
		Ts 1 (YEARS):	50	Ts 2 (YEARS):	1000				

TIME INTERVAL (YRS)	1		LAYER 1 LEA.	LAYER 2 LEACHATE CONC.	SOURCE AREA CONC.	FENCE LINE CONC.
ELAPSED TIME - YRS	CU1(PPB)	CU2(PPB)	CONC. (UG/L)	(UG/L)	(UG/L)	(UG/L)
0	1.35E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	1.35E+02	0.00E+00	3.50E-01	3.90E-02	4.06E-03	0.00E+00
2	1.35E+02	0.00E+00	6.99E-01	1.44E-01	1.51E-02	0.00E+00
3	1.35E+02	0.00E+00	1.05E+00	3.02E-01	3.15E-02	0.00E+00
4	1.35E+02	0.00E+00	1.39E+00	5.00E-01	5.21E-02	0.00E+00
5	1.35E+02	0.00E+00	1.74E+00	7.30E-01	7.61E-02	2.08E-16
6	1.35E+02	0.00E+00	2.09E+00	9.85E-01	1.03E-01	9.83E-14
7	1.35E+02	0.00E+00	2.43E+00	1.26E+00	1.31E-01	6.20E-12
8	1.35E+02	0.00E+00	2.78E+00	1.55E+00	1.61E-01	1.28E-10
9	1.35E+02	0.00E+00	3.12E+00	1.85E+00	1.93E-01	1.34E-09
10	1.35E+02	0.00E+00	3.46E+00	2.16E+00	2.25E-01	8.83E-09
11	1.35E+02	0.00E+00	3.80E+00	2.48E+00	2.58E-01	4.20E-08
12	1.35E+02	0.00E+00	4.14E+00	2.80E+00	2.92E-01	1.56E-07
13	1.35E+02	0.00E+00	4.48E+00	3.12E+00	3.25E-01	4.79E-07
14	1.35E+02	0.00E+00	4.82E+00	3.45E+00	3.60E-01	1.27E-06
15	1.35E+02	0.00E+00	5.16E+00	3.78E+00	3.94E-01	2.97E-06
16	1.35E+02	0.00E+00	5.49E+00	4.11E+00	4.29E-01	6.30E-06
17	1.35E+02	0.00E+00	5.83E+00	4.45E+00	4.63E-01	1.23E-05
18	1.35E+02	0.00E+00	6.16E+00	4.78E+00	4.98E-01	2.24E-05
19	1.35E+02	0.00E+00	6.50E+00	5.11E+00	5.33E-01	3.86E-05
20	1.35E+02	0.00E+00	6.83E+00	5.45E+00	5.68E-01	6.30E-05
21	1.35E+02	0.00E+00	7.16E+00	5.78E+00	6.02E-01	9.86E-05
22	1.35E+02	0.00E+00	7.49E+00	6.11E+00	6.37E-01	1.49E-04
23	1.35E+02	0.00E+00	7.83E+00	6.45E+00	6.72E-01	2.17E-04
24	1.35E+02	0.00E+00	8.16E+00	6.78E+00	7.06E-01	3.06E-04
25	1.35E+02	0.00E+00	8.48E+00	7.11E+00	7.41E-01	4.23E-04
26	1.35E+02	0.00E+00	8.81E+00	7.44E+00	7.76E-01	5.69E-04
27	1.35E+02	0.00E+00	9.14E+00	7.77E+00	8.10E-01	7.51E-04
28	1.35E+02	0.00E+00	9.47E+00	8.10E+00	8.44E-01	9.73E-04
29	1.35E+02	0.00E+00	9.79E+00	8.43E+00	8.79E-01	1.24E-03
30	1.35E+02	0.00E+00	1.01E+01	8.76E+00	9.13E-01	1.55E-03
31	1.35E+02	0.00E+00	1.04E+01	9.08E+00	9.47E-01	1.92E-03
32	1.35E+02	0.00E+00	1.08E+01	9.41E+00	9.81E-01	2.35E-03
33	1.35E+02	0.00E+00	1.11E+01	9.74E+00	1.01E+00	2.84E-03
34	1.35E+02	0.00E+00	1.14E+01	1.01E+01	1.05E+00	3.39E-03
35	1.35E+02	0.00E+00	1.17E+01	1.04E+01	1.08E+00	4.01E-03
36	1.35E+02	0.00E+00	1.20E+01	1.07E+01	1.12E+00	4.70E-03
37	1.35E+02	0.00E+00	1.24E+01	1.10E+01	1.15E+00	5.47E-03
38	1.35E+02	0.00E+00	1.27E+01	1.14E+01	1.18E+00	6.31E-03
39	1.35E+02	0.00E+00	1.30E+01	1.17E+01	1.22E+00	7.23E-03
40	1.35E+02	0.00E+00	1.33E+01	1.20E+01	1.25E+00	8.23E-03
41	1.35E+02	0.00E+00	1.36E+01	1.23E+01	1.28E+00	9.31E-03
42	1.35E+02	0.00E+00	1.39E+01	1.26E+01	1.32E+00	1.05E-02
43	1.35E+02	0.00E+00	1.43E+01	1.29E+01	1.35E+00	1.17E-02
44	1.35E+02	0.00E+00	1.46E+01	1.33E+01	1.38E+00	1.31E-02
45	1.35E+02	0.00E+00	1.49E+01	1.36E+01	1.42E+00	1.45E-02
46	1.35E+02	0.00E+00	1.52E+01	1.39E+01	1.45E+00	1.60E-02
47	1.35E+02	0.00E+00	1.55E+01	1.42E+01	1.48E+00	1.75E-02
48	1.35E+02	0.00E+00	1.58E+01	1.45E+01	1.51E+00	1.92E-02
49	1.35E+02	0.00E+00	1.61E+01	1.48E+01	1.55E+00	2.09E-02
50	1.35E+02	0.00E+00	1.64E+01	1.51E+01	1.58E+00	2.28E-02
MAXIMUM:	1.35E+02	0.00E+00	1.64E+01	1.51E+01	1.58E+00	2.28E-02

UNITS	UG/L	MG/KG	pCi/L	pCi/g
PERCIPITATION CONC.	1.35E+02	2.03E+00	4.52E+01	6.78E-01
LAYER 1 CONC	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LAYER 2 CONC	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE F.3.II-14

COMPARISON OF MODELED AND MEASURED CONCENTRATIONS FOR THE CONSTANT SOURCE SIMULATION AT THE LYSIMETERS

Source Areas	Performance Measures	Concentration (ug/L)
Lysimeter Test Well 11130	Modeled Perched Water Concentration (40 Years) in Top Layer	87.2
	Range of Measured Perched Water Concentration	2.8 - 13
Lysimeter Test Well 11131	Modeled Unsaturated GMA Concentration (40 Years) in Top Layer	12
	Measured Shallow Lysimeter Concentration	12
	Range of Measured Unsaturated GMA Concentration	3.4 - 12

TABLE F.3.II-15

SUMMARY OF MAJOR PARAMETERS IN THE LYSIMETER SHORT-TERM CONSTANT SOURCE CONFIRMATION MODEL

Model Parameters	Lysimeter Test Well 11130 &11131
Source Loading Area Size (ft x ft)	125 x 125
Top Glacial Overburten (i.e., gray clay) Thickness (ft)	1
Top Glacial Overburten (i.e., gray clay) K_d (L/kg)	4
Top Unsaturated Sand and Gravel Thickness (ft)	1
Top Unsaturated Sand and Gravel K_d (L/kg)	1.78
Infiltration Rate (in/yr)	8.4
Constant Source Leachate Concentration (mg/L)	0.3

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E-6161

TABLE F.3.II-16 ECTRAN OUTPUT FOR SHORT-TERM CONSTANT SOURCE, GLACIAL OVERBURDEN

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BROWN & ROOT ENVIRONMENTAL

SCREENING-LEVEL EXCEL-CRYSTAL BALL TRANSPORT (ECTran) MODEL

E: CRU5 FEMP
CRU5 F.S.
Layer 1

INVESTIGATOR: WYU
DATE: 6/19/94

CONTAMINANT: U238		SPECIFIC ACTIVITY (Ci/g):	3.35E-07
KOC (L/KG):	0.00	WATER CRITERIA (UG/L):	2.00E+01
HALF LIFE (YRS):		SOURCE LEACHATE CONC.(UG/L)	3.00E+02
LAYER 1:	4.47E+09	SOURCE LEACHATE Kd (L/KG):	4.00E+00
LAYER 2:	4.47E+09	INITIAL LAYER 1 SOIL CONC. (MG/KG):	0.00E+00
GMA:	4.47E+09	INITIAL LAYER 2 SOIL CONC. (MG/KG):	0.00E+00

UNSAT. SOURCE	AREA:	LAYER 1 (GLACIAL OVERBURDEN)		LAYER 2 (SAND & GRAVEL)		GREAT MIAMI AQUIFER (SAT. S. & G.)			
INFILT(FT/YR):	0.698	CU1(0) (PPB)	3.00E+02	CU2(0) (PPB):	0.00E+00	B (FT):	75	Vzo (FT/YR):	5.75
LENGTH (FT):	125	FOC (KG/KG):	0	FOC (KG/KG):	0.0000	GW Q3 (L/DAY)	8.12E+03	FOC (KG/KG):	0
WIDTH (FT):	125	Kd (L/KG):	4.00	Kd (L/KG):	1.780	GW V.(FT/YR):	365.00	Kd (L/KG):	1.78
POROSITY 1:	0.2	SATURATION:	1.00	SATURATION.	0.17	H (FT):	7.6444	RETARDATION:	11.08667
POROSITY 2:	0.3	THICKNESS (FT):	1.00	THICKNESS (FT):	9.00	EFF. POROSITY	0.30	q (FT/YR) :	0
DENSITY 1 (G/CM3):	1.78	DECAY (1/DAY):	4.25E-13	DECAY (1/DAY):	4.25E-13	DISPERSIVITY:		DECAY (1/YR):	1.0E-10
DENSITY 2 (G/CM3):	1.60	CAo (UG/L):	0.00E+00	CBo (PPB):	0.00E+00	Az(FT):	0.13	CU3 (PPB):	0
		D.F. 1 (1/YR):	0	D.F. 2 (1/YR):	0.010	Ax (FT):	160.00	P&T(YEARS):	0
AGE (YEARS):	0	Q1 (L/DAY):	8.46E+02	Q2 (L/DAY):	0.00E+00	Ay (FT):	53.33	DISTANCE TO F.L.(FT):	1600
		Ts 1 (YEARS):	5	Ts 2 (YEARS):	1000				

TIME INTERVAL (YRS)	1		LAYER 1 LEA.	LAYER 2 LEACHATE CONC.	SOURCE AREA CONC.	FENCE LINE CONC.
ELAPSED TIME - YRS	CU1(PPB)	CU2(PPB)	CONC. (UG/L)	(UG/L)	(UG/L)	(UG/L)
0	3.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	3.00E+02	0.00E+00	2.73E+01	3.68E-01	3.83E-02	0.00E+00
2	3.00E+02	0.00E+00	5.21E+01	1.41E+00	1.47E-01	0.00E+00
3	3.00E+02	0.00E+00	7.47E+01	3.06E+00	3.19E-01	0.00E+00
4	3.00E+02	0.00E+00	9.52E+01	5.22E+00	5.45E-01	0.00E+00
5	3.00E+02	0.00E+00	1.14E+02	7.85E+00	8.18E-01	1.96E-15
6	0.00E+00	0.00E+00	1.03E+02	1.05E+01	1.10E+00	9.27E-13
7	0.00E+00	0.00E+00	9.40E+01	1.28E+01	1.34E+00	5.86E-11
8	0.00E+00	0.00E+00	8.55E+01	1.49E+01	1.55E+00	1.22E-09
9	0.00E+00	0.00E+00	7.77E+01	1.66E+01	1.73E+00	1.28E-08
10	0.00E+00	0.00E+00	7.06E+01	1.81E+01	1.89E+00	8.52E-08
11	0.00E+00	0.00E+00	6.42E+01	1.94E+01	2.03E+00	4.08E-07
12	0.00E+00	0.00E+00	5.84E+01	2.05E+01	2.14E+00	1.53E-06
13	0.00E+00	0.00E+00	5.31E+01	2.15E+01	2.24E+00	4.75E-06
14	0.00E+00	0.00E+00	4.82E+01	2.22E+01	2.32E+00	1.27E-05
15	0.00E+00	0.00E+00	4.38E+01	2.29E+01	2.38E+00	3.00E-05
16	0.00E+00	0.00E+00	3.98E+01	2.34E+01	2.44E+00	6.41E-05
17	0.00E+00	0.00E+00	3.62E+01	2.38E+01	2.48E+00	1.26E-04
18	0.00E+00	0.00E+00	3.29E+01	2.40E+01	2.51E+00	2.30E-04
19	0.00E+00	0.00E+00	2.99E+01	2.42E+01	2.53E+00	3.95E-04
20	0.00E+00	0.00E+00	2.72E+01	2.44E+01	2.54E+00	6.43E-04
21	0.00E+00	0.00E+00	2.47E+01	2.44E+01	2.54E+00	1.00E-03
22	0.00E+00	0.00E+00	2.25E+01	2.44E+01	2.54E+00	1.49E-03
23	0.00E+00	0.00E+00	2.04E+01	2.43E+01	2.53E+00	2.15E-03
24	0.00E+00	0.00E+00	1.86E+01	2.42E+01	2.52E+00	3.00E-03
25	0.00E+00	0.00E+00	1.69E+01	2.40E+01	2.50E+00	4.07E-03
26	0.00E+00	0.00E+00	1.53E+01	2.38E+01	2.48E+00	5.39E-03
27	0.00E+00	0.00E+00	1.40E+01	2.35E+01	2.45E+00	6.98E-03
28	0.00E+00	0.00E+00	1.27E+01	2.33E+01	2.43E+00	8.86E-03
29	0.00E+00	0.00E+00	1.15E+01	2.30E+01	2.40E+00	1.10E-02
30	0.00E+00	0.00E+00	1.05E+01	2.27E+01	2.36E+00	1.35E-02
31	0.00E+00	0.00E+00	9.53E+00	2.23E+01	2.33E+00	1.63E-02
32	0.00E+00	0.00E+00	8.66E+00	2.20E+01	2.29E+00	1.95E-02
33	0.00E+00	0.00E+00	7.87E+00	2.16E+01	2.25E+00	2.29E-02
34	0.00E+00	0.00E+00	7.15E+00	2.12E+01	2.21E+00	2.67E-02
35	0.00E+00	0.00E+00	6.50E+00	2.09E+01	2.17E+00	3.07E-02
36	0.00E+00	0.00E+00	5.91E+00	2.05E+01	2.13E+00	3.50E-02
37	0.00E+00	0.00E+00	5.37E+00	2.01E+01	2.09E+00	3.96E-02
38	0.00E+00	0.00E+00	4.88E+00	1.97E+01	2.05E+00	4.45E-02
39	0.00E+00	0.00E+00	4.44E+00	1.93E+01	2.01E+00	4.95E-02
40	0.00E+00	0.00E+00	4.04E+00	1.89E+01	1.97E+00	5.48E-02
41	0.00E+00	0.00E+00	3.67E+00	1.85E+01	1.93E+00	6.02E-02
42	0.00E+00	0.00E+00	3.34E+00	1.81E+01	1.89E+00	6.58E-02
43	0.00E+00	0.00E+00	3.03E+00	1.77E+01	1.85E+00	7.15E-02
44	0.00E+00	0.00E+00	2.76E+00	1.73E+01	1.80E+00	7.73E-02
45	0.00E+00	0.00E+00	2.50E+00	1.69E+01	1.76E+00	8.31E-02
46	0.00E+00	0.00E+00	2.28E+00	1.65E+01	1.72E+00	8.90E-02
47	0.00E+00	0.00E+00	2.07E+00	1.62E+01	1.68E+00	9.49E-02
48	0.00E+00	0.00E+00	1.88E+00	1.58E+01	1.65E+00	1.01E-01
49	0.00E+00	0.00E+00	1.71E+00	1.54E+01	1.61E+00	1.07E-01
50	0.00E+00	0.00E+00	1.55E+00	1.51E+01	1.57E+00	1.12E-01
MAXIMUM:	3.00E+02	0.00E+00	1.14E+02	2.44E+01	2.54E+00	1.12E-01

UNITS	UG/L	MG/KG	pCi/L	pCi/g
PERCIPITATION CONC	3.00E+02	1.20E+00	1.01E+02	4.02E-01
LAYER 1 CONC.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LAYER 2 CONC.	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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TABLE F.3.II-17 ECTRAN OUTPUT FOR SHORT-TERM CONSTANT SOURCE, SAND AND GRAVEL

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BROWN & ROOT ENVIRONMENTAL

SCREENING-LEVEL EXCEL-CRYSTAL BALL TRANSPORT (ECTran) MODEL

SITE:	CRU5 FEMP	CONTAMINANT: U238		SPECIFIC ACTIVITY (Ci/g):	3.35E-07
	CRU5 F.S.	KOC (L/KG):	0.00	WATER CRITERIA (UG/L):	2.00E+01
	Layer 2	HALF LIFE (YRS):		SOURCE LEACHATE CONC.(UG/L)	3.00E+02
		LAYER 1:	4.47E+09	SOURCE LEACHATE Kd (L/KG):	4.00E+00
INVESTIGATOR:	WYU	LAYER 2:	4.47E+09	INITIAL LAYER 1 SOIL CONC. (MG/KG):	0.00E+00
DATE:	6/19/94	GMA:	4.47E+09	INITIAL LAYER 2 SOIL CONC. (MG/KG).	0.00E+00

UNSAT. SOURCE	AREA:	LAYER 1 (GLACIAL OVERBURDEN)		LAYER 2 (SAND & GRAVEL)		GREAT MIAMI AQUIFER (SAT. S. & G.)			
INFILT(FT/YR):	0.698	CU1(0) (PPB)	3.00E+02	CU2(0) (PPB):	0.00E+00	B (FT):	75	Vzo (FT/YR):	5.75
LENGTH (FT):	125	FOC (KG/KG):	0	FOC (KG/KG):	0.0000	GW Q3 (L/DAY)	8.12E+03	FOC (KG/KG):	0
WIDTH (FT):	125	Kd (L/KG):	4.00	Kd (L/KG):	1.780	GW V.(FT/YR):	365.00	Kd (L/KG):	1.78
POROSITY 1:	0.2	SATURATION:	1.00	SATURATION:	0.17	H (FT):	7.6444	RETARDATION:	11.08667
POROSITY 2:	0.3	THICKNESS (FT):	10.00	THICKNESS (FT):	1.00	EFF. POROSITY	0.30	q (FT/YR) :	0
DENSITY 1 (G/CM3):	1.78	DECAY (1/DAY):	4.25E-13	DECAY (1/DAY):	4.25E-13	DISPERSIVITY:		DECAY (1/YR):	1.6E-10
DENSITY 2 (G/CM3):	1.60	CAo (UG/L):	0.00E+00	CBo (PPB):	0.00E+00	Az(FT):	0.13	CU3 (PPB):	0
		D.F. 1 (1/YR):	0	D.F. 2 (1/YR):	0.010	Ax (FT):	160.00	P&T(YEARS):	0
AGE (YEARS):	0	Q1 (L/DAY):	8.46E+02	Q2 (L/DAY):	0.00E+00	Ay (FT):	53.33	DISTANCE TO F.L.(FT):	1600
		Ts 1 (YEARS):	5	Ts 2 (YEARS):	1000				

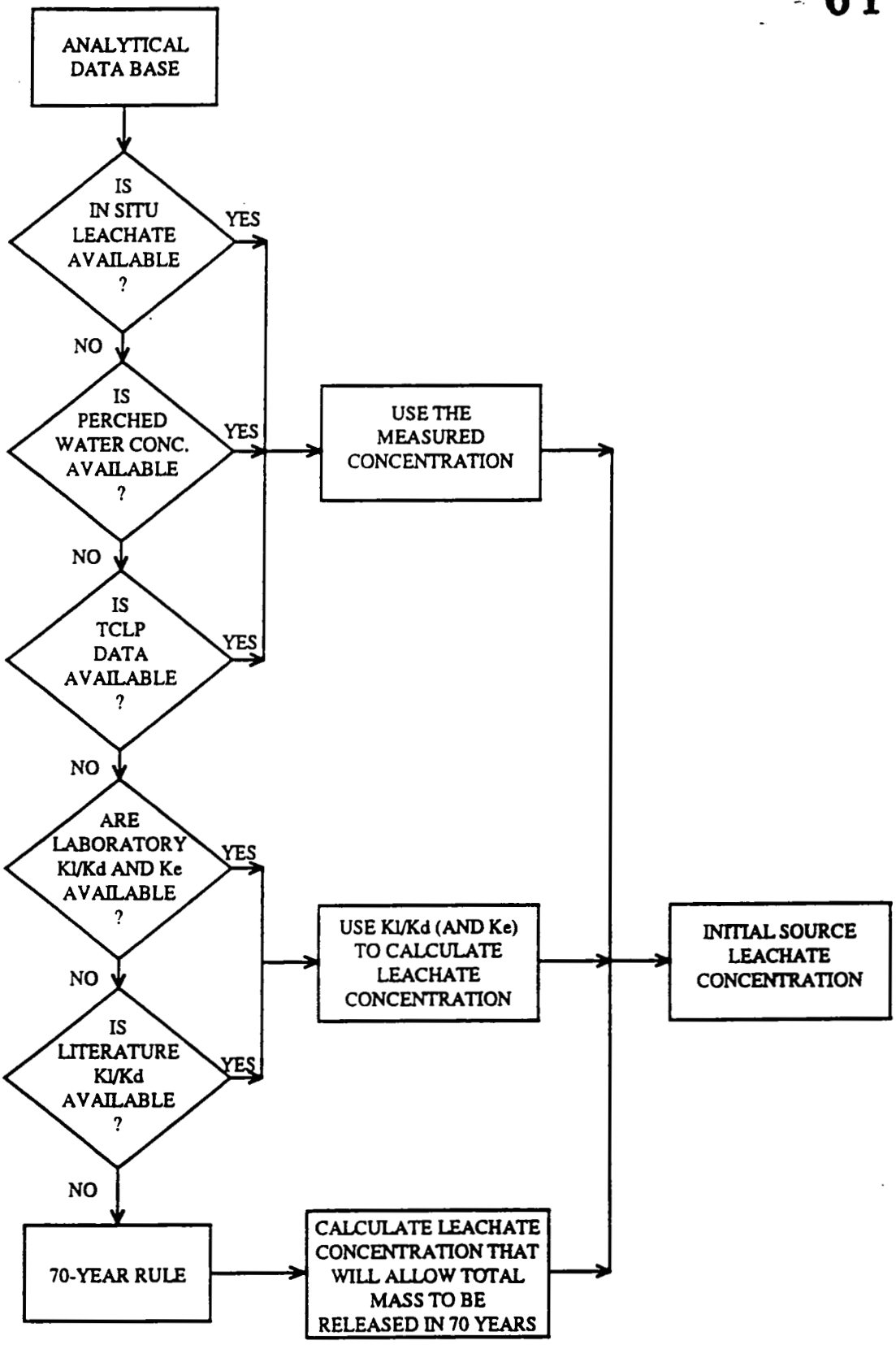
TIME INTERVAL (YRS)	1					
ELAPSED TIME - YRS	CU1(PPB)	CU2(PPB)	LAYER 1 LEA. CONC. (UG/L)	LAYER 2 LEACHATE CONC. (UG/L)	SOURCE AREA CONC. (UG/L)	FENCE LINE CONC. (UG/L)
0	3.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	3.00E+02	0.00E+00	2.85E+00	3.18E-01	3.31E-02	0.00E+00
2	3.00E+02	0.00E+00	5.67E+00	1.17E+00	1.22E-01	0.00E+00
3	3.00E+02	0.00E+00	8.46E+00	2.45E+00	2.55E-01	0.00E+00
4	3.00E+02	0.00E+00	1.12E+01	4.05E+00	4.22E-01	0.00E+00
5	3.00E+02	0.00E+00	1.40E+01	5.89E+00	6.14E-01	1.69E-15
6	0.00E+00	0.00E+00	1.38E+01	7.61E+00	7.93E-01	8.01E-13
7	0.00E+00	0.00E+00	1.37E+01	8.93E+00	9.30E-01	5.05E-11
8	0.00E+00	0.00E+00	1.36E+01	9.94E+00	1.04E+00	1.05E-09
9	0.00E+00	0.00E+00	1.35E+01	1.07E+01	1.12E+00	1.09E-08
10	0.00E+00	0.00E+00	1.33E+01	1.13E+01	1.18E+00	7.19E-08
11	0.00E+00	0.00E+00	1.32E+01	1.17E+01	1.22E+00	3.41E-07
12	0.00E+00	0.00E+00	1.31E+01	1.20E+01	1.25E+00	1.27E-06
13	0.00E+00	0.00E+00	1.29E+01	1.22E+01	1.27E+00	3.89E-06
14	0.00E+00	0.00E+00	1.28E+01	1.24E+01	1.29E+00	1.03E-05
15	0.00E+00	0.00E+00	1.27E+01	1.24E+01	1.30E+00	2.40E-05
16	0.00E+00	0.00E+00	1.26E+01	1.25E+01	1.30E+00	5.06E-05
17	0.00E+00	0.00E+00	1.25E+01	1.25E+01	1.30E+00	9.83E-05
18	0.00E+00	0.00E+00	1.23E+01	1.25E+01	1.30E+00	1.77E-04
19	0.00E+00	0.00E+00	1.22E+01	1.24E+01	1.30E+00	3.01E-04
20	0.00E+00	0.00E+00	1.21E+01	1.24E+01	1.29E+00	4.84E-04
21	0.00E+00	0.00E+00	1.20E+01	1.23E+01	1.28E+00	7.44E-04
22	0.00E+00	0.00E+00	1.19E+01	1.22E+01	1.27E+00	1.10E-03
23	0.00E+00	0.00E+00	1.18E+01	1.21E+01	1.27E+00	1.56E-03
24	0.00E+00	0.00E+00	1.17E+01	1.20E+01	1.26E+00	2.15E-03
25	0.00E+00	0.00E+00	1.15E+01	1.20E+01	1.25E+00	2.88E-03
26	0.00E+00	0.00E+00	1.14E+01	1.19E+01	1.24E+00	3.76E-03
27	0.00E+00	0.00E+00	1.13E+01	1.18E+01	1.23E+00	4.81E-03
28	0.00E+00	0.00E+00	1.12E+01	1.17E+01	1.21E+00	6.03E-03
29	0.00E+00	0.00E+00	1.11E+01	1.15E+01	1.20E+00	7.42E-03
30	0.00E+00	0.00E+00	1.10E+01	1.14E+01	1.19E+00	8.99E-03
31	0.00E+00	0.00E+00	1.09E+01	1.13E+01	1.18E+00	1.07E-02
32	0.00E+00	0.00E+00	1.08E+01	1.12E+01	1.17E+00	1.26E-02
33	0.00E+00	0.00E+00	1.07E+01	1.11E+01	1.16E+00	1.47E-02
34	0.00E+00	0.00E+00	1.06E+01	1.10E+01	1.15E+00	1.69E-02
35	0.00E+00	0.00E+00	1.05E+01	1.09E+01	1.14E+00	1.93E-02
36	0.00E+00	0.00E+00	1.04E+01	1.08E+01	1.13E+00	2.18E-02
37	0.00E+00	0.00E+00	1.03E+01	1.07E+01	1.12E+00	2.44E-02
38	0.00E+00	0.00E+00	1.02E+01	1.06E+01	1.11E+00	2.72E-02
39	0.00E+00	0.00E+00	1.01E+01	1.05E+01	1.10E+00	3.00E-02
40	0.00E+00	0.00E+00	1.00E+01	1.04E+01	1.09E+00	3.29E-02
41	0.00E+00	0.00E+00	9.91E+00	1.03E+01	1.08E+00	3.58E-02
42	0.00E+00	0.00E+00	9.82E+00	1.02E+01	1.07E+00	3.88E-02
43	0.00E+00	0.00E+00	9.73E+00	1.01E+01	1.06E+00	4.18E-02
44	0.00E+00	0.00E+00	9.63E+00	1.00E+01	1.05E+00	4.49E-02
45	0.00E+00	0.00E+00	9.54E+00	9.93E+00	1.04E+00	4.80E-02
46	0.00E+00	0.00E+00	9.45E+00	9.84E+00	1.03E+00	5.10E-02
47	0.00E+00	0.00E+00	9.36E+00	9.75E+00	1.02E+00	5.40E-02
48	0.00E+00	0.00E+00	9.27E+00	9.65E+00	1.01E+00	5.70E-02
49	0.00E+00	0.00E+00	9.18E+00	9.56E+00	9.97E-01	6.00E-02
50	0.00E+00	0.00E+00	9.10E+00	9.47E+00	9.87E-01	6.29E-02
MAXIMUM:	3.00E+02	0.00E+00	1.40E+01	1.25E+01	1.30E+00	6.29E-02

UNITS	UG/L	MG/KG	pCi/L	pCi/g
PERCIPITATION CONC	3.00E+02	1.20E+00	1.01E+02	4.02E-01
LAYER 1 CONC.	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LAYER 2 CONC.	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE F.3.II-18

COMPARISON OF MODELED AND MEASURED CONCENTRATIONS FOR SHORT-TERM CONSTANT SOURCE SIMULATION AT THE LYSIMETER

Source Areas	Performance Measures	Concentration (ug/L)
Lysimeter Test Well	Modeled Perched Water Concentration (40 Years) in Top Layer	4.04
11130 & 11131	Range of Measured Perched Water Concentration	2.8 - 13
	Modeled Unsaturated GMA Concentration (40 Years) in Top Layer	10.4
	Measured Shallow Lysimeter Concentration	12
	Range of Measured Unsaturated GMA Concentration	3.4 - 12



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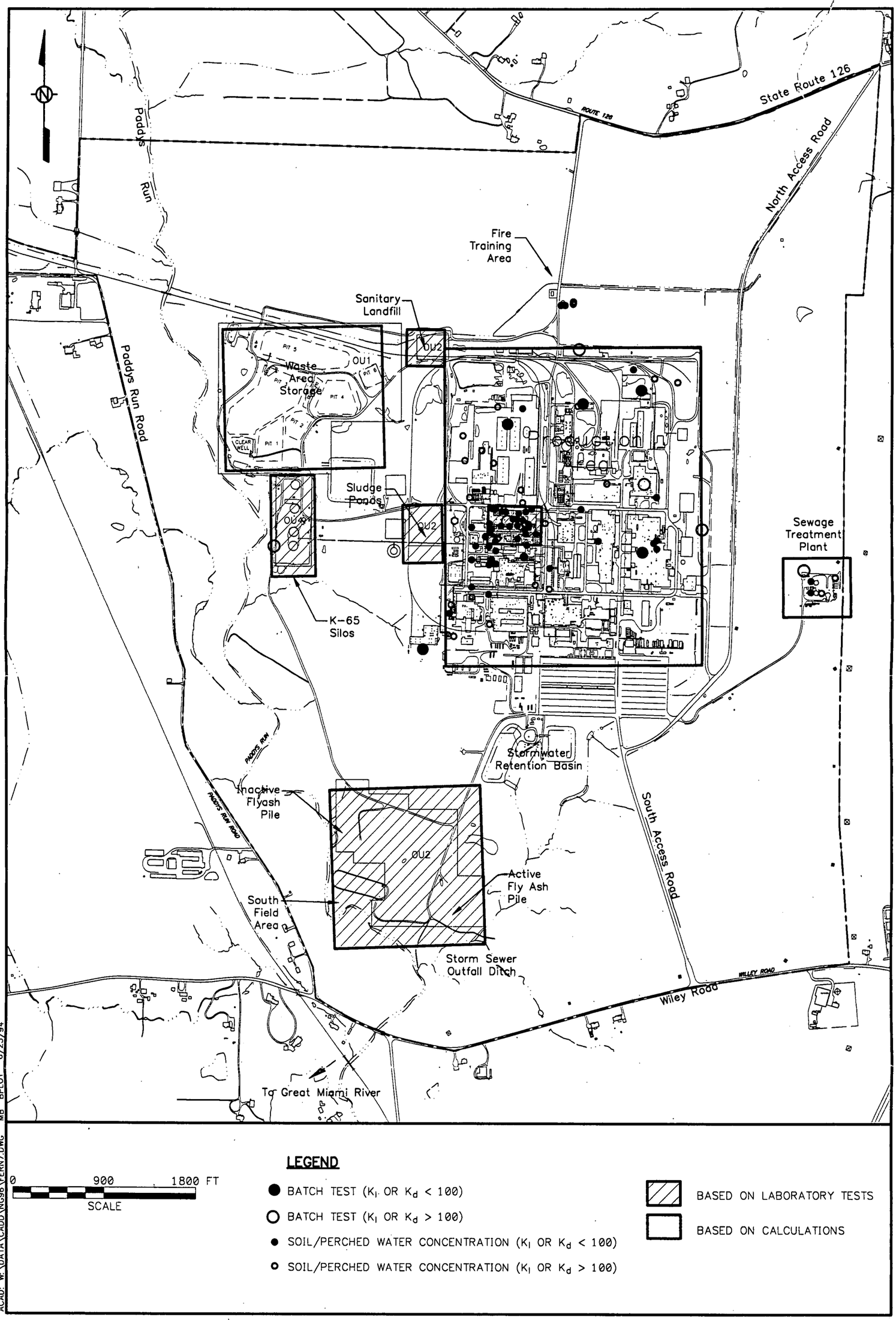
~\ILLUS\OU-5\PO-116\SOURCE LEACH.EPS

FIGURE F.3.II-1 SOURCE LEACHATE CONCENTRATION ESTIMATION



ACAD: W:\DATA\CADD\NG96\FERN7.DWG MB BPLOT 6/23/94

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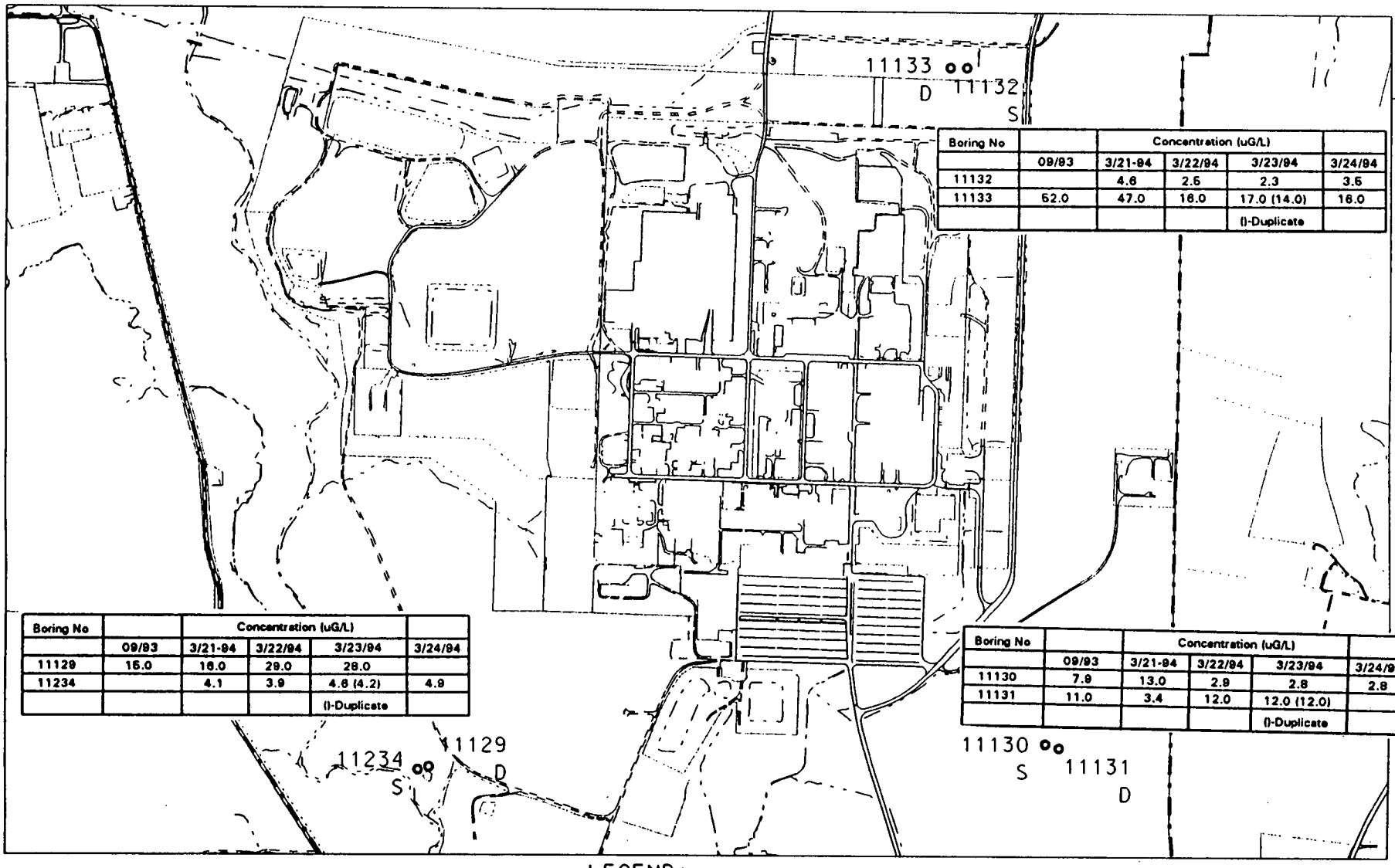
FIGURE F.3.II-2 AREAS WITH AVAILABLE SITE-SPECIFIC URANIUM K_l OR K_d VALUES



Boring No		Concentration (uG/L)			
	09/93	3/21-94	3/22/94	3/23/94	3/24/94
11132		4.6	2.5	2.3	3.5
11133	52.0	47.0	16.0	17.0 (14.0)	16.0
				(I)-Duplicate	

Boring No		Concentration (uG/L)			
	09/93	3/21-94	3/22/94	3/23/94	3/24/94
11129	15.0	18.0	29.0	28.0	
11234		4.1	3.9	4.6 (4.2)	4.9
				(I)-Duplicate	

Boring No		Concentration (uG/L)			
	09/93	3/21-94	3/22/94	3/23/94	3/24/94
11130	7.9	13.0	2.9	2.8	2.8
11131	11.0	3.4	12.0	12.0 (12.0)	
				(I)-Duplicate	

LEGEND:

- FEMP BOUNDARY
- o GENERAL LYSIMETER
- S SHALLOW
- D DEEP

SCALE

900 450 0 900 FEET

DRAFT

/USR/ERMA/CRU5/DGN/MAP/HOR/DPTH/LYSIMETER.DGN
STATE PLANAR COORDINATE SYSTEM 1927

FIGURE F.3.II-3 LOCATION MAP OF OPERABLE UNIT 5 LYSIMETERS

004243

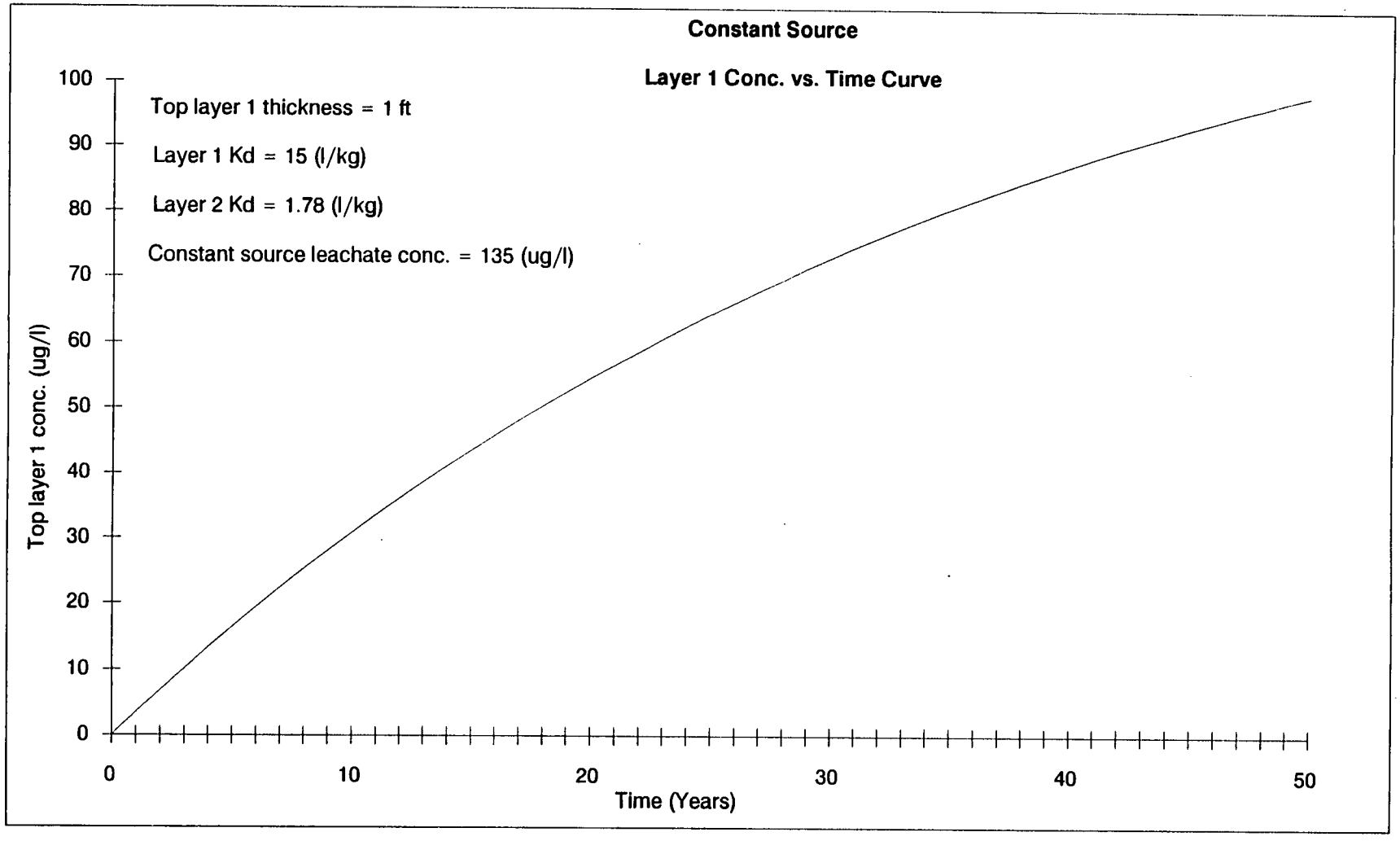


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FIGURE F.3.II-4 GLACIAL OVERBURDEN LEACHATE CONCENTRATION CURVE VS. TIME FOR CONSTANT SOURCE

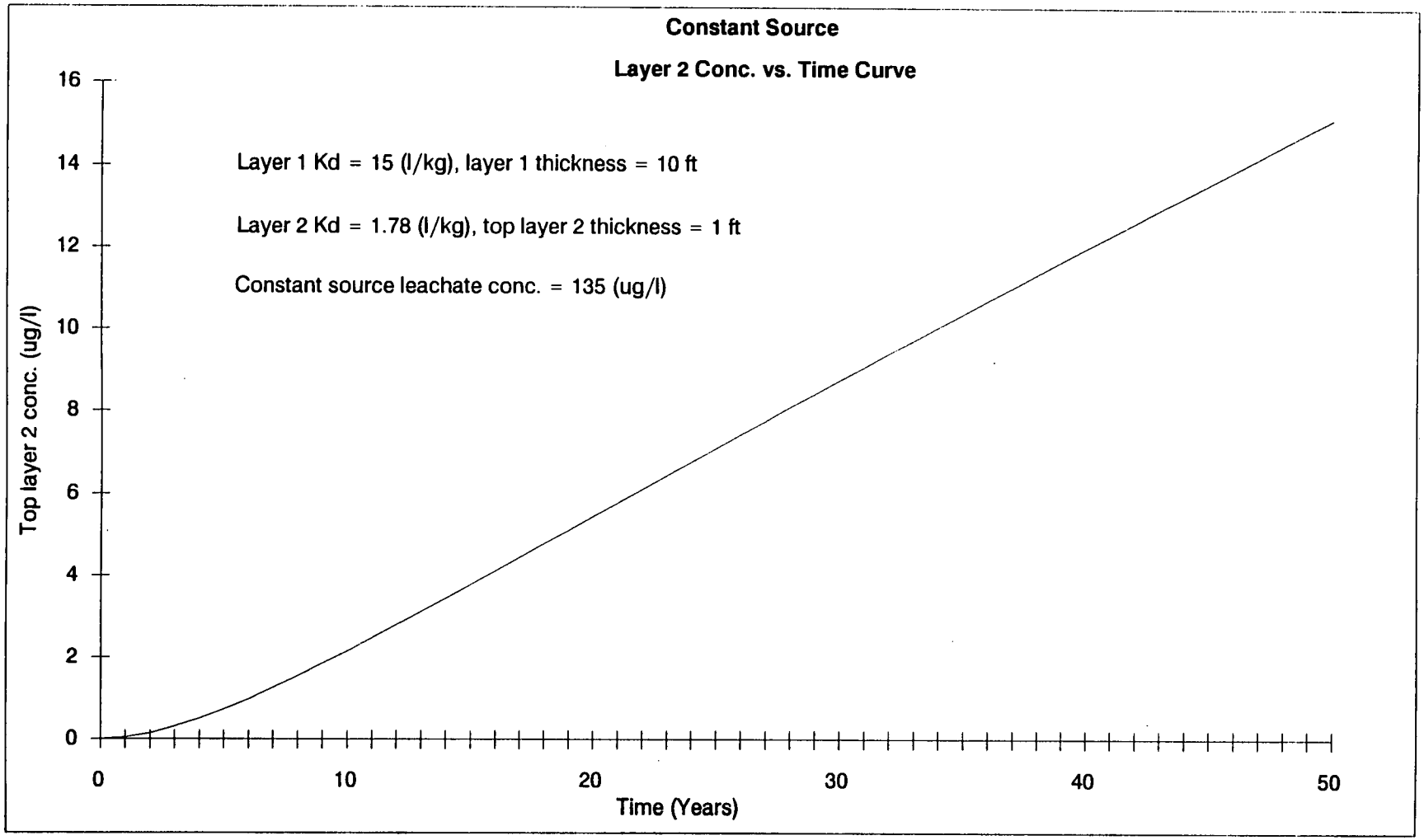

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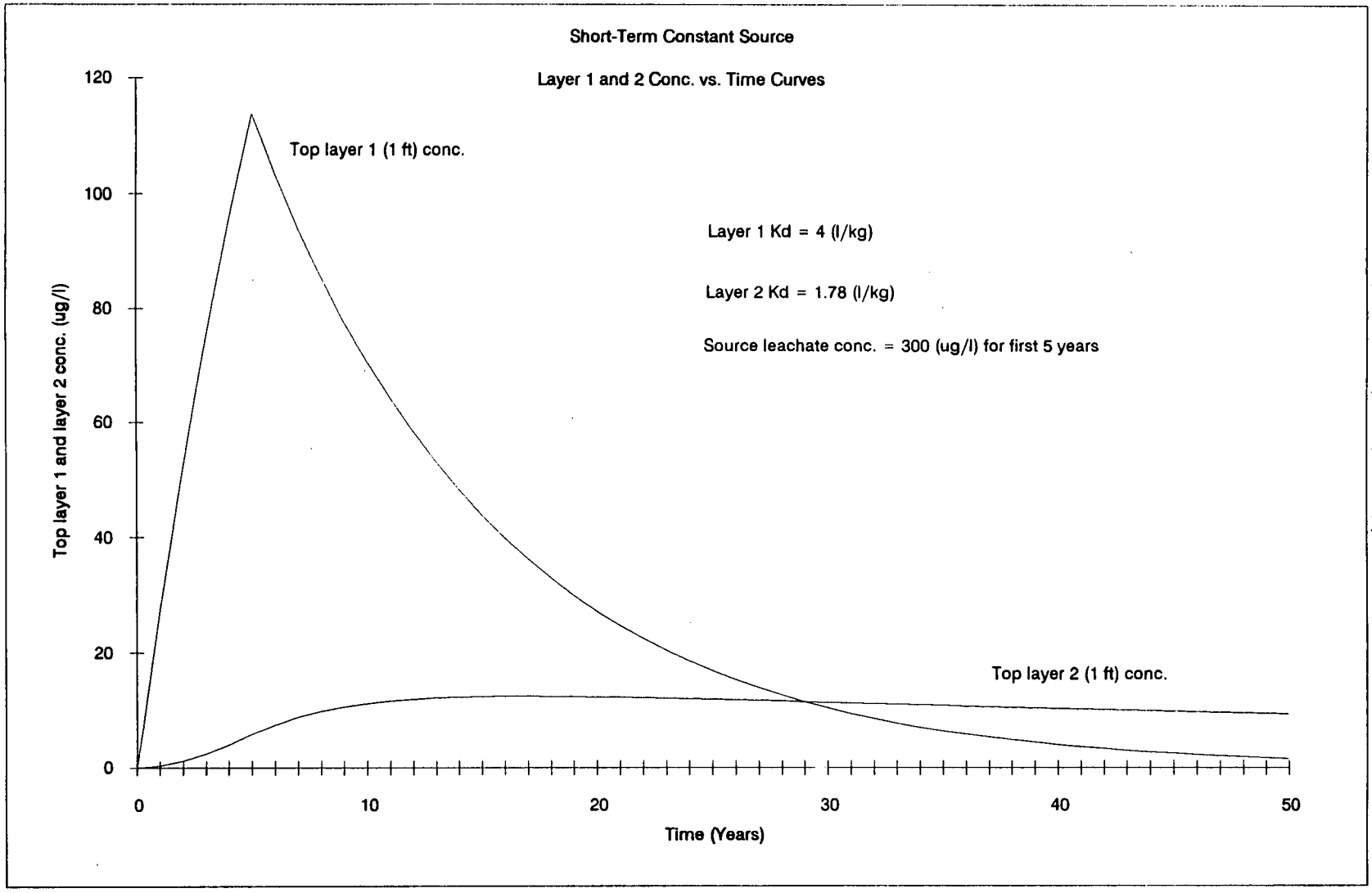
FIGURE F.3.II-5 SAND AND GRAVEL LEACHATE CONCENTRATION CURVE VS. TIME FOR CONSTANT SOURCE



DRAFT FIGURE F.3.II-6 LAYER-SPECIFIC CONCENTRATION CURVES VS. TIME FOR SHORT-TERM CONSTANT SOURCE

APPENDIX F.3-II-A

PERCHED WATER CONCENTRATIONS, SOIL CONCENTRATIONS, AND PRODUCTION AREA K_l and K_d CALCULATIONS

Summary of Perched Water and Soil Concentrations Used for Calculating Kl and Kd

WELL	DATE	SCREEN DEPTH	TOTAL GW U CONC (UG/L) PPB	SOIL DEPTH	SOIL U CONC (UG/G) PPM	SOIL DEPTH	SOIL U CONC (UG/G) PPM	AVE. SOIL U CONC (UG/G) PPM	CORRECTED SOIL U CONC (UG/KG) PPB	CORRECTED Kl OR Kd (L/KG)
1131	01/16/90	2.5 - 7.5	2180.00	3 - 7	212.30			212.30	208624.00	95.70
1145	10/03/89	10.8 - 19.8	96200.00	10 - 15	227.50			227.50	205020.00	2.13
1148	08/10/89	13.8-18.6	13900.00	10 - 10.5	479.00			479.00	472980.00	34.03
1149	07/19/89	10 - 14.6	13800.00	10 - 15	150.50			150.50	144500.00	10.47
1151	10/26/89	5.5 - 10.1	240.00	5.5 - 7	8.30			8.30	5012.00	20.88
1154	05/05/89	6.9 - 11.7	296.00	10 - 15	12.00			12.00	8700.80	29.39
1167	05/05/89	5 - 9.8	16.00	3 - 5.5	18.00			18.00	14756.80	922.30
1179	10/18/89	11 - 18	568.00	10 - 15	12.00			12.00	8646.40	15.22
1180	02/16/90	3.6 - 8.5	11100.00	3 - 5.5	148.00	3 - 5.5	160.00	154.00	148540.00	13.38
1181	07/19/89	4 - 9	150.00	3 - 5.5	28.00			28.00	24730.00	164.87
1182	11/01/89	8 - 13	9747.00	10 - 15	114.00			114.00	108810.60	11.16
1183	11/01/89	10.5 - 15.5	8632.00	10 - 15	224.00	15 - 20	134.00	179.00	174033.60	20.16
1185	11/01/89	14 - 19	1020.00	10 - 15	49.70			49.70	46256.00	45.35
1186	07/19/89	10 - 15	48800.00	10 - 15	105.00			105.00	92000.00	1.89
1187	06/07/89	10 - 15	574.00	10 - 15	47.00			47.00	43645.20	76.04
1194	01/21/90	10.3 - 15	812.00	10 - 15	24.80			24.80	21397.60	26.35
1195	01/21/90	11 - 15.7	16000.00	10 - 15	62.00			62.00	55560.00	3.47
1196	01/21/90	9.6 - 14.6	14900.00	10 - 15	157.00			157.00	150780.00	10.12
1198	06/07/89	10 - 15	138.00	10 - 15	18.00			18.00	14732.40	106.76
1199	06/03/89	8 - 18	18690.00	10 - 15	375.50	15 - 20	735.00	555.25	548272.00	29.34
1200	06/03/89	6.5 - 16.5	3286.00	10 - 15	55.00	15 - 20	34.00	44.50	40602.80	12.36
1201	06/03/89	8 - 13.5	281.00	10 - 15	22.00			22.00	18703.80	66.56
1202	06/04/89	6.5 - 16	1372.00	10 - 15	62.00	15 - 20	60.00	61.00	57485.60	41.90
1203	06/04/89	6.5 - 16.5	49.40	10 - 15	65.00	15 - 20	24.00	44.50	41250.12	835.02
1204	01/22/90	13.5 - 18.5	4200.00	10 - 15	60.00			60.00	55920.00	13.31
1205	07/17/89	9.8 - 14.6	1444.00	10 - 15	33.00			33.00	29471.20	20.41
1206	06/06/89	9.8 - 14.6	1846.00	10 - 15	16.00			16.00	12390.80	6.71
1207	06/02/89	4 - 9	736.00	3 - 5.5	22.00			22.00	18612.80	25.29
1209	06/06/89	6.5 - 16.5	21400.00	10 - 15	36.00	15 - 20	48.00	42.00	34480.00	1.61

WELL	DATE	SCREEN DEPTH	TOTAL GW U CONC (UG/L) PPB	SOIL DEPTH	SOIL U CONC (UG/G) PPM	SOIL DEPTH	SOIL U CONC (UG/G) PPM	AVE. SOIL U CONC (UG/G) PPM	CORRECTED SOIL U CONC (UG/KG) PPB	CORRECTED KI OR Kd (L/KG)
1212	01/18/90	6.5 - 16	25100.00	10 - 15	170.00	15 - 20	259.00	214.50	206240.00	8.22
1213	06/06/89	4.4 - 9.2	35260.00	3 - 3.5	129.50			129.50	119208.00	3.38
1214	01/16/90	8.9 - 14.1	2156.00	10 - 15	467.00			467.00	463328.80	214.90
1215	11/01/89	10.1 - 15.1	1170.00	10 - 15	28.70			28.70	25226.00	21.56
1216	11/01/89	11.1 - 16.1	215.00	10 - 10.5	8.30			8.30	5017.00	23.33
1217	01/18/90	9.75 - 14.75	3606.00	10 - 15	49.40			49.40	45438.80	12.60
1219	06/02/89	6.5 - 11.5	1539.00	6 - 6.5	18.00			18.00	14452.20	9.39
1220	06/04/89	4.8 - 19.6	4429.00	3 - 5.5	113.50	10 - 20	10.90	62.20	58074.20	13.11
1221	01/16/90	8.8 - 14	1636.00	10 - 10.5	65.20	13.5 - 14	16.50	40.85	37282.80	22.79
1224	06/04/89	9.6 - 19.6	3699.00	10 - 15	11.00	15 - 20	27.00	19.00	15020.20	4.06
1225 *	08/13/90	11.1 - 16.1	141.00	15 - 20 *	7.30			7.30	4031.80	28.59
1230 *	10/23/89	8.0 - 18.0	2010.00	15 - 20 *	27.00			27.00	23358.00	11.62
1231	11/02/89	8.0 - 20.0	13850.00	10 - 15	16.20	15 - 20	88.24	52.22	46210.00	3.34
1232	10/17/89	4.6 - 19.6	15700.00	10 - 15	104.00			104.00	97620.00	6.22
1233	06/08/89	6.8 - 19.8	21650.00	10 - 15	56.00	15 - 20	35.00	40.50	32930.00	1.52
1236	06/04/89	6.4 - 13.1	9630.00	5.5 - 7.0	373.50	10 - 15	55.00	214.25	209084.00	21 71
1240	06/01/89	8.1 - 13.4	827.00	10 - 15	15.00			15.00	11594.60	14.02
1244	10/25/89	9.7 - 14.6	23.00	10 - 15	25.00			25.00	21755.40	945.89
1245	10/17/89	11.5 - 16.5	92.00	10.5 - 11	15.00			15.00	11741.60	127.63
1246	08/11/89	5.0 - 15.0	141.00	10 - 15	505.00			505.00	501731.80	3558.38
1250 *	06/15/90	10.6 - 20.0	427.00	15 - 20 *	17.20			17.20	13874.60	32.49
1266 *	10/25/89	10.0 - 20.0	11.00	15 - 20 *	30.00			30.00	26757.80	2432.53
1267 *	10/25/89	8.0 - 16.5	86.00	15 - 20 *	16.00			16.00	12742.80	148.17
1271	07/16/89	4.0 - 9.0	844.00	5.5 - 7.0	18.00			18.00	14591.20	17.29
1277	07/16/89	4.0 - 9.0	544.00	3.0 - 5.5	51.00			51.00	47651.20	87.59
1280	07/16/89	13.0 - 18.0	71.80	10 - 15	36.00			36.00	32745.64	456.07
1281	07/16/89	7.0 - 12.0	147.00	10 - 15	19.00			19.00	15730.60	107.01
1287	08/02/89	5.0 - 14.75	84.80	3.0 - 5.5	16.00			16.00	12743.04	150.27
1317 *	08/01/90	14.6 - 19.6	15.40	15 - 20 *	5.40			5.40	2156.92	140.06
1324	07/25/90	5.0 - 13.5	364993.00	3.0 - 5.5	292.00			292.00	215761.40	0.59
1338	10/06/89	5.0 - 10.0	40.00	< 5'	73.00			73.00	69752.00	1743.80
1339	10/17/89	5.0 - 12.0	441.00	3.0 - 5.5	6.60			6.60	3271.80	7.42
1341 *	07/13/90	14.6 - 19.6	36.90	15 - 20 *	6.90			6.90	3652.62	98.99
1347	10/06/89	9.8 - 19.8	152.00	10 - 15	22.00			22.00	18729.60	123.22

WELL	DATE	SCREEN DEPTH	TOTAL GW U CONC (UG/L) PPB	SOIL DEPTH	SOIL U CONC (UG/G) PPM	SOIL DEPTH	SOIL U CONC (UG/G) PPM	AVE. SOIL U CONC (UG/G) PPM	CORRECTED SOIL U CONC (UG/KG) PPB	CORRECTED KI OR Kd (L/KG)
1348 *	07/28/90	15.0 - 19.7	12.90	15 - 20 *	5.60			5.60	2357.42	182.75
1354 *	08/26/90	15.0 - 20.0	102.00	15 - 20 *	10.90			10.90	7639.60	74.90
1356	10/09/89	10.0 - 19.8	240.00	10 - 15	119.00	15 - 20	14.00	66.50	63212.00	263.38
1357	10/09/89	11.5 - 16.5	748.00	10.5 - 11	17.00			17.00	13610.40	18.20
1360 *	07/28/90	8.0 - 16.5	15.00	15 - 20 *	16.00			16.00	12757.00	850.47
1441	05/16/90	7.5 - 17.5	6400.00	10 - 15	20.70			20.70	16180.00	2.53
1443	05/21/90	8.0 - 18.0	43.60	10 - 15	53.00			53.00	49751.28	1141.08
1447	07/17/90	2.5 - 7.5	350.00	3.0 - 5.5	7.40			7.40	4090.00	11.69
1448	05/18/90	4.5 - 14.5	13.70	5.5 - 7.0	7.00	10 - 15	8.60	7.80	4557.26	332.65
1509	05/02/90	4.5 - 19.5	183.00	3 - 3.5	8.82			8.82	5543.40	30.29
1510	05/03/90	3.5 - 8.5	96.20	3.0 - 5.5	8.50			8.50	5240.76	54.48
1513	06/16/90	5.0 - 20.0	103.00	10 - 15	20.70			20.70	17439.40	169.31
1515	05/02/90	3.0 - 5.5	11.00	3.0 - 13.0	6.70			6.70	3457.80	314.35
									Count=	76.00
									Mean=	219.82
									StDev=	556.40
									GeoMean=	37.74

(Note: Assumed Water Content by Weight = 20%;

Corrected Soil Concentration = Soil Concentration - (Groundwater Concentration x 200 ml) - Background Soil Concentration; and,

Corrected Kd = Corrected Soil Concentration / Groundwater Concentration.

***= Denotes Well Where Soil Samples Were Taken at Depths Appropriate for Kd Calculations)**

APPENDIX F.3-II-B

OU4 BATCH TEST RESULTS

CRU4 Desorption Test for Waste Material Sample #064158

LEACHATE ANALYTICAL PARAMETERS	SAMPLING PERIOD (DAYS)								
	Start 8/19/93	1	4	6	8	11	12	13	14 Final[1]
Total-U Conc. (ug/l)	N/A	4307	3744	3875	3734	3863	3771	3826	3979/ 5150
pH	9.86	9.53	9.56	9.74	9.75	9.69	9.71	9.64	9.61
Oxidation Reduction Potential - E_H (mV)	-209.0	-188.5	-194.4	-202.2	-193.5	-203.0	-206.0	-202.1	-197.4
Specific Conductivity (uMHOS)	350	540	540	520	560	560	560	560	510
Temp. (°C)	23.8	25.5	24.7	23.6	25.9	25.3	N/A	23.4	22.6

Initial Soil Uranium Concentration = 128 ppm (IT) & 110 ppm (FEMP)
Soil Sample Wt. = 400g
Liquid to Soil Ratio = 8.75
Moisture Content = 82.38% solid
N/A - Not Analyzed
[1] - Final sample split and analyzed for total-U by FEMP and IT

CRU4 Desorption Test for Waste Material Sample #064159

LEACHATE ANALYTICAL PARAMETERS	SAMPLING PERIOD (DAYS)									
	Start 8/19/93	1	4	6	8	11	12	13	14	15 Final[1]
Total-U Conc. (ug/l)	N/A	4775	3525	3611	3446	3737	4035	4464	4023	3756/ 4930
pH	9.95	9.73	9.73	9.92	9.94	9.90	9.92	9.83	9.83	9.83
Oxidation Reduction Potential - E_H (mV)	-212.0	-199.9	-204.5	-212.3	-209.8	-215.8	N/A	-212.6	-208.6	-213.2
Specific Conductivity (uMHOS)	380	680	680	680	690	680	680	680	630	650
Temp. (°C)	23.8	25.4	25.1	23.7	25.6	24.9	N/A	23.4	22.8	24.6

Initial Soil Uranium Concentration = 106 ppm (IT) & 100 ppm (FEMP)
Soil Sample Wt. = 400g
Liquid to Soil Ratio = 8.75
Moisture Content = 82.28% solid
N/A - Not Analyzed
[1] - Final sample split and analyzed for total-U by FEMP and IT

Sample #064158

$$Cs = \frac{(128)(400)-(5150)(3.5)}{400} = 82.9 \text{ ug/g}$$

$$Cs' = 82.9 - 3.7 = 79.2 \text{ ug/g}$$

$$Kd = \frac{79.2 \times 1000}{5150} = 15.4 \text{ L/kg}$$

Sample #064159

$$Cs = \frac{(106)(400) - (4930)(3.5)}{400} = 62.9 \text{ ug/g}$$

$$Cs' = 62.9 - 3.7 = 59.2 \text{ ug/g}$$

$$Kd = \frac{59.2 \times 1000}{4930} = 12 \text{ L/kg}$$

Notes: Cs → Final Soil Uranium Concentration

Cs' → Background Corrected Soil Uranium Concentration (using 3.7 ug/g as the background Uranium Concentration)

Final Water Uranium Concentrations (i.e., 5150 ug/L and 4930 ug/L) are from the IT Lab.

APPENDIX F.3-II-C

OU5 BATCH TEST RESULTS

SUMMARY OF ESTIMATED TOTAL URANIUM K_ts FROM OPERABLE UNIT 5 BATCH TEST RESULTS

Sample Number and Location	Initial Total Uranium Concentration In Soil, C_o (mg/kg)	Estimated Total Uranium K_t (L/kg)
AS-1 (Plant 9)	192	1870
AS-2 (Plant 2/3)	256	149
AS-3 (Plant 6)	1500	13.3
AS-4 (Pilot Plant)	75.4	9.2
AS-5 (Graphite Furnace)	87.9	5.3
AS-6 (Paddys Run)	27.9	358
AS-7 (South of KC-2 Warehouse)	50.3	147
AS-8 (D&D Facility)	49.7	37.3
AS-9 (East of Building 77/79)	54.3	209
IDA (Incinerator)	502	240
IDB (Plant 1 Pad)	539	31.8

OU5 BATCH TEST
SYMBOLS AND UNITS

V = VOLUME OF LIQUID USED DURING TEST (L)

M = MASS OF SOIL (kg)

C_0 = INITIAL CONCENTRATION OF URANIUM IN SOIL (µg/kg)

C_S = CONCENTRATION OF URANIUM IN SOIL AT EQUILIBRIUM (µg/kg)

C_L = CONCENTRATION OF URANIUM IN LIQUID AT EQUILIBRIUM (µg/kg)

C_b = BACKGROUND CONCENTRATION OF URANIUM IN SOIL (µg/kg)

C_S' = FINAL CONCENTRATION OF URANIUM IN SOIL ABOVE BACKGROUND (µg/L)

M_L = MASS OF URANIUM LEACHED FROM SOIL (µg)

M_S = MASS OF URANIUM IN SOIL AT EQUILIBRIUM (µg)

OU5 BATCH TEST EQUATIONS

$$M_L = C_L V$$

$$M_S = C_o M - M_L$$

$$C_S = \frac{M_S}{M}$$

$$C_S' = C_S - C_b$$

$$K_1 = \frac{C_S'}{C_L}$$

E-6181

K_d CALCULATIONS
FOR DESORPTION TESTS

OU5 Kd Calculations Using Batch Test Results

Sample	Co (ug/kg)	Cl (ug/L)	ml (ug)	ms (ug)	Cs (ug/kg)	Cb (ug/kg)	C's (ug/kg)	K_l (L/kg)
AS-1 (Plant 9)	1.92E+05	1.00E+02	3.50E+02	7.65E+04	1.91E+05	3.70E+03	1.87E+05	1.87E+03
AS-2 (Plant 2/3)	2.56E+05	1.60E+03	5.60E+03	9.68E+04	2.42E+05	3.70E+03	2.38E+05	1.49E+02
AS-3 (Plant 6)	1.50E+06	6.80E+04	2.38E+05	3.62E+05	9.05E+05	3.70E+03	9.01E+05	1.33E+01
AS-4 (Pilot Plant)	7.54E+04	4.00E+03	1.40E+04	1.62E+04	4.04E+04	3.70E+03	3.67E+04	9.18E+00
AS-5 (Graphite Furnace)	8.79E+04	6.00E+03	2.10E+04	1.42E+04	3.54E+04	3.70E+03	3.17E+04	5.28E+00
AS-6 (Paddys Run)	2.79E+04	6.60E+01	2.31E+02	1.09E+04	2.73E+04	3.70E+03	2.36E+04	3.58E+02
AS-7 (South of KC-2 Warehouse)	5.03E+04	3.00E+02	1.05E+03	1.91E+04	4.77E+04	3.70E+03	4.40E+04	1.47E+02
AS-8 (D&D Facility)	4.97E+04	1.00E+03	3.50E+03	1.64E+04	4.10E+04	3.70E+03	3.73E+04	3.73E+01
AS-9 (East of Buliding 77/79)	5.43E+04	2.32E+02	8.12E+02	2.09E+04	5.23E+04	3.70E+03	4.86E+04	2.09E+02
IDA (Incinerator)	5.02E+05	2.00E+03	7.00E+03	1.94E+05	4.85E+05	3.70E+03	4.81E+05	2.40E+02
IDB (Plant 1 Pad)	5.39E+05	1.32E+04	4.62E+04	1.69E+05	4.24E+05	3.70E+03	4.20E+05	3.18E+01

DESORPTION TEST CALCULATION EXAMPLE

The following is an example of desorption testing calculations for Sample No. AS-3 (Plant 6) to determine the K_1 value.

Given:

C_o	=	1.50×10^6 ug/kg
C_L	=	6.80×10^4 ug/L
M	=	0.4 kg
V	=	3.5 L
C_b	=	3.70×10^3 ug/kg

Calculations:

$$m_L = C_L \times V = 6.80 \times 10^4 \mu g/L \times 3.5L = 2.38 \times 10^5 \mu g$$

$$m_S = C_o \times M = 1.50 \times 10^6 \ \mu g/kg \times 0.40kg = 6.00 \times 10^5 \ \mu g$$

$$C_s = \frac{m_s - m_L}{M} = \frac{6.00 \times 10^5 \mu g - 2.38 \times 10^5 \mu g}{0.40kg} = 9.05 \times 10^5 \mu g/kg$$

$$C_s' = C_s - C_b = 9.05 \times 10^5 \mu g/kg - 3.70 \times 10^3 \mu g/kg = 9.01 \times 10^5 \mu g/kg$$

$$K_1 = \frac{C_s'}{C_1} = \frac{9.01 \times 10^5 \mu g/kg}{6.80 \times 10^4 \mu g/L} = 13 \ L/kg$$

F.3.III Attachment

E-6161

LABORATORY RESULTS FOR DESORPTION TESTS

DESORPTION TEST
AS-1
(PLANT 9)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	91	53	78.7	127	59.6	116	98	382	200	<100
Percent Conc. Change (%)		-41.76	48.49	61.37	-53.07	94.63	-15.52	289.80	-47.64	-50.00
pH	8.95	8.97	9.05	9.47	9.05	8.97	9.00	8.83	8.82	8.79
Conductivity (uMHOS)	620	620	580	490	570	640	630	700	700	700
Temperature (degree C)	23.3	23.0	18.9	13.4	17.3	23.8	23.4	27.7	28.0	28.2

DESORPTION TEST
AS-2
(PLANT 2/3)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	655	821	933	1790	1352	1277	1285	1356	1800	1600
Percent Conc. Change (%)		25.34	13.64	91.85	-24.47	-5.55	0.63	5.53	32.74	-11.11
pH	8.36	8.37	8.46	8.75	8.48	8.35	8.43	8.29	8.30	8.33
Conductivity (uMHOS)	279	272	256	222	249	291	290	321	324	328
Temperature (degree C)	22.7	22.3	18.7	13.1	16.9	24.0	24.3	27.9	28.6	28.5

DESORPTION TEST
AS 3
(PLANT 6)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	16700	23600	23600	43800	46900	53100	56200	61400	57700	68000
Percent Conc. Change (%)		41.32	0.00	85.59	7.08	13.22	5.84	9.25	-6.03	17.85
pH	8.14	8.14	8.33	8.67	8.35	8.25	8.27	8.14	8.15	8.19
Conductivity (uMHOS)	550	530	500	430	480	580	580	620	620	640
Temperature (degree C)	23.4	22.9	19.2	13.2	17.4	24.0	24.0	27.9	28.3	28.4

DESORPTION TEST
AS 4
(PILOT PLANT)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	187	233	2864	3878	3806	3260	3856	4183	3900	4000
Percent Conc. Change (%)		24.60	1129.18	35.41	-1.86	-14.35	18.28	8.48	-6.77	2.56
pH	8.46	8.30	8.60	8.98	8.63	8.56	8.66	8.45	8.46	8.48
Conductivity (uMHOS)	149	161	160	157	179	219	220	262	272	282
Temperature (degree C)	22.8	22.9	19.1	13.1	17.0	24.1	23.6	27.8	28.4	28.1

DESORPTION TEST
AS-5
(GRAPHITE FURNACE)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	167	258	2998	4795	4859	4697	5241	5379	5300	6000
Percent Conc. Change (%)		54.49	1062.02	59.94	1.33	-3.33	11.58	2.63	-1.47	13.21
pH	8.07	7.86	7.99	8.30	8.00	7.90	7.94	7.71	7.71	7.65
Conductivity (uMHOS)	132	150	156	162	191	240	251	316	329	361
Temperature (degree C)	22.8	22.7	19.0	13.3	17.2	23.7	24.0	27.9	28.2	28.4

DESORPTION TEST
AS-6
(PADDYS RUN)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	41	121	66.8	161	69.4	134	87.4	61	70	66
Percent Conc. Change (%)		195.12	-44.79	141.02	-56.89	93.08	-34.78	-30.21	14.75	-5.71
pH	7.66	7.66	7.60	7.60	7.45	7.35	7.29	6.92	6.95	6.89
Conductivity (uMHOS)	147	171	181	202	228	275	290	435	448	490
Temperature (degree C)	23.5	22.5	18.1	11.9	13.7	20.5	20.6	28.7	28.4	28.4

DESORPTION TEST
AS-7
(SOUTH OF KC-2 WAREHOUSE)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	188	197	211	288	256	281	290	300	300	300
Percent Conc. Change (%)		4.79	7.11	36.49	-11.11	9.77	3.20	3.45	0.00	0.00
pH	9.35	9.20	9.29	9.43	9.27	9.13	9.05	8.67	8.68	8.60
Conductivity (uMHOS)	169	171	161	142	152	180	183	245	250	265
Temperature (degree C)	23.5	22.5	17.9	12.1	14.2	20.4	20.2	28.8	28.6	28.4

DESORPTION TEST
AS-8
(D&D FACILITY)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	280	408	476	745	399	633	731	700	300	1000
Percent Conc. Change (%)	-	45.71	16.67	56.51	-46.44	58.65	15.48	-4.24	-57.14	233.33
pH	8.30	8.20	8.37	8.54	8.35	8.25	8.25	7.89	7.89	7.87
Conductivity (uMHOS)	130	140	142	141	156	190	192	281	289	309
Temperature (degree C)	23.5	22.4	17.9	11.9	14.1	20.9	19.5	29.1	29.0	29.0

DESORPTION TEST
AS-9
(EAST OF BUILDING 77/79)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	126	184	196	311	316	282	331	200	300	232
Percent Conc. Change (%)		46.03	6.52	58.67	1.61	-10.76	17.38	-39.58	50.00	-22.67
pH	7.59	7.28	7.44	7.34	7.24	7.13	7.14	6.83	6.86	6.82
Conductivity (uMHOS)	205	281	289	289	314	318	369	510	540	560
Temperature (degree C)	22.9	23.0	17.8	11.9	14.4	20.7	19.8	29.0	28.9	28.8

DESORPTION TEST
IDA
(INCINERATOR)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	611	897	1849	2142	2171	1906	1860	1800	1800	2000
Percent Conc. Change (%)		46.81	106.13	15.85	1.35	-12.21	-2.41	-3.23	0.00	11.11
pH	7.87	7.36	7.98	8.18	8.06	7.93	7.88	7.60	7.60	7.57
Conductivity (uMHOS)	131	141	132	122	134	160	160	222	227	240
Temperature (degree C)	23.4	23.0	17.9	12.0	14.6	20.8	20.1	29.1	28.9	28.6

DESORPTION TEST
IDB
(PLANT 1 PAD)

Analytical Parameters	Experiment Time (days)									
	1	2	3	7	8	9	10	13	14	16
Total U Conc. (ug/l)	603	734	7833	10400	12000	10300	11500	11400	11800	13200
Percent Conc. Change (%)		21.72	967.17	32.77	15.38	-14.17	11.65	-0.87	3.51	11.86
pH	7.96	7.84	8.16	8.70	8.30	8.29	8.38	8.19	8.19	8.22
Conductivity (uMHOS)	177	181	173	160	182	220	221	262	270	280
Temperature (degree C)	23.2	22.9	19.2	13.3	17.7	23.8	23.6	27.7	28.1	28.2

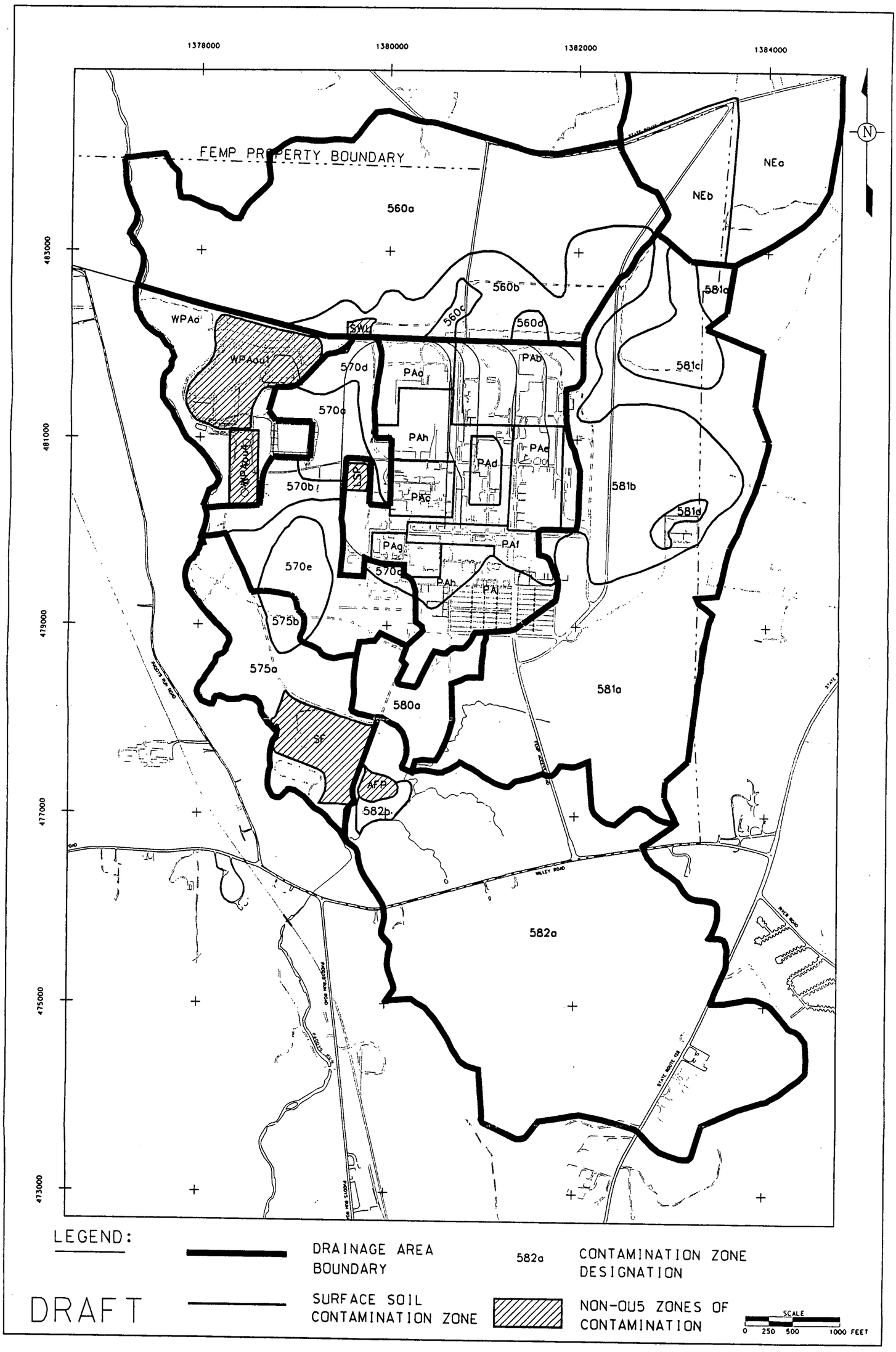


FIGURE F.3.III-1. GROUNDWATER PATHWAY SOURCE AREA DELINEATION

Neptunium-237

CRU 5 RI

Initial Mass and Concentration

Compound Type	Rad	
Kd Vodose 1	5.50E+01	ml/g
Kd Vadose 2	5.00E+00	ml/g
Rd Vadose 1	6.03E+02	
Rd Vadose 2	4.65E+01	
Screening Level	3.12E-08	mg/l
Lambda	8.87E-10	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.150E-03	1.671E+03	2.091E-05	5.50E+01
560B	2	0.000E+00	0.000E+00	0.000E+00	5.50E+01
560C	3	0.000E+00	0.000E+00	0.000E+00	5.50E+01
560D	4	0.000E+00	0.000E+00	0.000E+00	5.50E+01
570A	5	8.470E-04	1.231E+03	1.540E-05	5.50E+01
570B	6	0.000E+00	0.000E+00	0.000E+00	5.50E+01
570C	7	0.000E+00	0.000E+00	0.000E+00	5.50E+01
570D	8	2.940E-04	4.273E+02	5.345E-06	5.50E+01
570E	9	0.000E+00	0.000E+00	0.000E+00	5.50E+01
575A	10	0.000E+00	0.000E+00	0.000E+00	5.50E+01
575B	11	0.000E+00	0.000E+00	0.000E+00	5.50E+01
580A	12	0.000E+00	0.000E+00	0.000E+00	5.50E+01
581A	13	0.000E+00	0.000E+00	0.000E+00	5.50E+01
581B	14	0.000E+00	0.000E+00	0.000E+00	5.50E+01
581C	15	0.000E+00	0.000E+00	0.000E+00	5.50E+01
581D	16	0.000E+00	0.000E+00	0.000E+00	5.50E+01
582A	17	0.000E+00	0.000E+00	0.000E+00	5.50E+01
582B	18	0.000E+00	0.000E+00	0.000E+00	5.50E+01
PAA	19	0.000E+00	0.000E+00	0.000E+00	5.50E+01
PAB	20	0.000E+00	0.000E+00	0.000E+00	5.50E+01
PAC	21	3.730E-03	7.228E+04	6.782E-05	5.50E+01
PAD	22	0.000E+00	0.000E+00	0.000E+00	5.50E+01
PAE	23	1.010E-03	1.566E+04	1.836E-05	5.50E+01
PAF	24	0.000E+00	0.000E+00	0.000E+00	5.50E+01
PAG	25	0.000E+00	0.000E+00	0.000E+00	5.50E+01
PAH	26	9.580E-04	1.392E+03	1.742E-05	5.50E+01
PAI	27	0.000E+00	0.000E+00	0.000E+00	5.50E+01
WPAA	28	1.180E-03	1.715E+03	2.145E-05	5.50E+01

Initial Concentration Toxicity Screening Status Requires Modeling 2

Radium-226

CRU 5 RI

Initial Mass and Concentration

Compound Type	Rad	
Kd Vodose 1	6.96E+02	ml/g
Kd Vadose 2	1.06E+02	ml/g
Rd Vadose 1	7.62E+03	
Rd Vadose 2	9.65E+02	
Screening Level	4.04E-11	mg/l
Lambda	1.19E-06	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	9.880E-07	1.436E+00	1.420E-09	6.96E+02
560B	2	1.600E-06	2.326E+00	2.299E-09	6.96E+02
560C	3	2.330E-06	3.387E+00	3.348E-09	6.96E+02
560D	4	2.980E-03	4.331E+03	4.282E-06	6.96E+02
570A	5	1.750E-06	2.544E+00	2.514E-09	6.96E+02
570B	6	1.340E-06	1.948E+00	1.925E-09	6.96E+02
570C	7	1.010E-06	1.468E+00	1.451E-09	6.96E+02
570D	8	1.250E-05	1.817E+01	1.796E-08	6.96E+02
570E	9	1.210E-06	1.759E+00	1.739E-09	6.96E+02
575A	10	7.080E-07	1.029E+00	1.017E-09	6.96E+02
575B	11	5.060E-07	7.354E-01	7.270E-10	6.96E+02
580A	12	3.030E-07	4.404E-01	4.353E-10	6.96E+02
581A	13	1.310E-06	1.904E+00	1.882E-09	6.96E+02
581B	14	5.670E-06	8.241E+00	8.147E-09	6.96E+02
581C	15	1.200E-06	1.744E+00	1.724E-09	6.96E+02
581D	16	2.790E-05	4.055E+01	4.009E-08	6.96E+02
582A	17	1.090E-06	1.584E+00	1.566E-09	6.96E+02
582B	18	1.980E-06	2.878E+00	2.845E-09	6.96E+02
PAA	19	2.750E-03	3.997E+03	3.951E-06	6.96E+02
PAB	20	1.950E-06	2.834E+00	2.802E-09	6.96E+02
PAC	21	3.210E-06	6.221E+01	4.612E-09	6.96E+02
PAD	22	1.110E-06	1.183E+01	1.595E-09	6.96E+02
PAE	23	1.310E-06	2.031E+01	1.882E-09	6.96E+02
PAF	24	1.270E-06	1.846E+00	1.825E-09	6.96E+02
PAG	25	3.520E-06	5.116E+00	5.057E-09	6.96E+02
PAH	26	3.250E-06	4.724E+00	4.670E-09	6.96E+02
PAI	27	2.630E-06	3.823E+00	3.779E-09	6.96E+02
WPAA	28	3.900E-05	5.668E+01	5.603E-08	6.96E+02

Initial Concentration Toxicity Screening Status Requires Modeling 5

Strontium-90

CRU 5 RI

Initial Mass and Concentration

Compound Type	Rad	
Kd Vodose 1	1.00E+01	ml/g
Kd Vadose 2	2.50E+00	ml/g
Rd Vadose 1	1.11E+02	
Rd Vadose 2	2.37E+01	
Screening Level	1.02E-12	mg/l
Lambda	6.64E-05	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.02E-08	1.485E-02	1.022E-09	1.00E+01
560B	2	3.36E-08	4.880E-02	3.358E-09	1.00E+01
560C	3	3.10E-09	4.498E-03	3.095E-10	1.00E+01
560D	4	4.74E-08	6.896E-02	4.745E-09	1.00E+01
570A	5	6.57E-09	9.548E-03	6.569E-10	1.00E+01
570B	6	1.31E-08	1.910E-02	1.314E-09	1.00E+01
570C	7	5.11E-09	7.426E-03	5.109E-10	1.00E+01
570D	8	1.24E-08	1.804E-02	1.241E-09	1.00E+01
570E	9	8.03E-09	1.167E-02	8.029E-10	1.00E+01
575A	10	3.10E-09	4.498E-03	3.095E-10	1.00E+01
575B	11	3.10E-09	4.498E-03	3.095E-10	1.00E+01
580A	12	3.10E-09	4.498E-03	3.095E-10	1.00E+01
581A	13	1.12E-08	1.623E-02	1.117E-09	1.00E+01
581B	14	1.23E-08	1.793E-02	1.234E-09	1.00E+01
581C	15	3.14E-08	4.562E-02	3.139E-09	1.00E+01
581D	16	2.70E-08	3.925E-02	2.701E-09	1.00E+01
582A	17	8.76E-09	1.273E-02	8.759E-10	1.00E+01
582B	18	3.10E-09	4.498E-03	3.095E-10	1.00E+01
PAA	19	2.26E-08	3.289E-02	2.263E-09	1.00E+01
PAB	20	2.48E-08	3.607E-02	2.482E-09	1.00E+01
PAC	21	2.91E-08	5.639E-01	2.910E-09	1.00E+01
PAD	22	8.10E-09	8.633E-02	8.100E-10	1.00E+01
PAE	23	4.16E-08	6.449E-01	4.160E-09	1.00E+01
PAF	24	1.39E-08	2.026E-02	1.394E-09	1.00E+01
PAG	25	2.82E-08	4.106E-02	2.825E-09	1.00E+01
PAH	26	1.62E-08	2.355E-02	1.620E-09	1.00E+01
PAI	27	3.10E-09	4.498E-03	3.095E-10	1.00E+01
WPAA	28	7.30E-09	1.061E-02	7.299E-10	1.00E+01

Initial Concentration Toxicity Screening Status Requires Modeling 8

Technetium-99

CRU 5 RI

Initial Mass and Concentration

Compound Type	Rad	
Kd Vodose 1	1.18E-01	ml/g
Kd Vadose 2	7.00E-02	ml/g
Rd Vadose 1	2.29E+00	
Rd Vadose 2	1.64E+00	
Screening Level	2.18E-07	mg/l
Lambda	8.92E-09	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	7.650E-05	1.112E+02	6.483E-04	1.18E-01
560B	2	9.410E-05	1.368E+02	7.975E-04	1.18E-01
560C	3	1.610E-03	2.340E+03	1.364E-02	1.18E-01
560D	4	0.000E+00	0.000E+00	0.000E+00	1.18E-01
570A	5	3.000E-04	4.360E+02	2.542E-03	1.18E-01
570B	6	2.820E-04	4.099E+02	2.390E-03	1.18E-01
570C	7	0.000E+00	0.000E+00	0.000E+00	1.18E-01
570D	8	1.940E-03	2.820E+03	1.644E-02	1.18E-01
570E	9	0.000E+00	0.000E+00	0.000E+00	1.18E-01
575A	10	0.000E+00	0.000E+00	0.000E+00	1.18E-01
575B	11	0.000E+00	0.000E+00	0.000E+00	1.18E-01
580A	12	0.000E+00	0.000E+00	0.000E+00	1.18E-01
581A	13	6.470E-05	9.404E+01	5.483E-04	1.18E-01
581B	14	6.650E-04	9.665E+02	5.636E-03	1.18E-01
581C	15	0.000E+00	0.000E+00	0.000E+00	1.18E-01
581D	16	1.340E-02	1.948E+04	1.136E-01	1.18E-01
582A	17	0.000E+00	0.000E+00	0.000E+00	1.18E-01
582B	18	0.000E+00	0.000E+00	0.000E+00	1.18E-01
PAA	19	0.000E+00	0.000E+00	0.000E+00	1.18E-01
PAB	20	4.760E-04	6.918E+02	4.034E-03	1.18E-01
PAC	21	2.200E-03	4.263E+04	1.864E-02	1.18E-01
PAD	22	1.290E-04	1.375E+03	1.093E-03	1.18E-01
PAE	23	2.630E-04	4.077E+03	2.229E-03	1.18E-01
PAF	24	1.410E-04	2.049E+02	1.195E-03	1.18E-01
PAG	25	1.180E-03	1.715E+03	1.000E-02	1.18E-01
PAH	26	9.410E-05	1.368E+02	7.975E-04	1.18E-01
PAI	27	0.000E+00	0.000E+00	0.000E+00	1.18E-01
WPAA	28	3.120E-04	4.535E+02	2.644E-03	1.18E-01

Initial Concentration Toxicity Screening Status Requires Modeling 9

Uranium–Total

CRU 5 RI

Initial Mass and Concentration

E-6161

Compound Type	Rad	
Kd Vodose 1	1.50E+01	ml/g
Kd Vadose 2	1.78E+00	ml/g
Rd Vadose 1	1.65E+02	
Rd Vadose 2	1.72E+01	
Screening Level	8.93E−04	mg/l
Lambda	4.25E−13	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.55E+01	2.253E+07	6.982E−02	222
560B	2	3.04E+02	4.418E+08	1.369E+00	222
560C	3	1.17E+03	1.701E+09	7.800E+01	15
560D	4	3.62E+02	5.261E+08	1.631E+00	222
570A	5	7.79E+01	1.132E+08	3.509E−01	222
570B	6	4.28E+02	6.221E+08	1.928E+00	222
570C	7	3.60E+01	5.232E+07	1.622E−01	222
570D	8	2.77E+03	4.026E+09	1.248E+01	222
570E	9	6.35E+01	9.229E+07	2.860E−01	222
575A	10	2.40E+01	3.488E+07	1.081E−01	222
575B	11	5.88E+01	8.546E+07	2.649E−01	222
580A	12	1.87E+01	2.718E+07	8.423E−02	222
581A	13	2.13E+01	3.096E+07	9.595E−02	222
581B	14	5.63E+02	8.183E+08	2.536E+00	222
581C	15	4.76E+01	6.918E+07	2.144E−01	222
581D	16	7.57E+03	1.100E+10	5.047E+02	15
582A	17	1.15E+01	1.671E+07	5.180E−02	222
582B	18	4.44E+02	6.453E+08	2.000E+00	222
PAA	19	1.23E+04	1.788E+10	8.200E+02	15
PAB	20	7.08E+02	1.029E+09	4.720E+01	15
PAC	21	2.00E+02	3.876E+09	1.333E+01	15
PAD	22	1.20E+02	1.279E+09	8.000E+00	15
PAE	23	5.87E+02	9.101E+09	3.913E+01	15
PAF	24	2.22E+02	3.227E+08	1.000E+00	222
PAG	25	4.31E+04	6.264E+10	1.941E+02	222
PAH	26	9.94E+01	1.445E+08	4.477E−01	222
PAI	27	4.17E+01	6.061E+07	1.878E−01	222
WPAA	28	3.74E+02	5.436E+08	1.685E+00	222

Initial Concentration Toxicity Screening Status Requires Modeling 15

6161

Uranium – Total

CRU 5 RI

Initial Mass and Concentration

Sensitivity Analysis – 1

Compound Type	Rad	
Kd Vodose 1	1.50E+01	ml/g
Kd Vadose 2	1.78E+00	ml/g
Rd Vadose 1	1.65E+02	
Rd Vadose 2	1.72E+01	
Screening Level	8.93E−04	mg/l
Lambda	4.25E−13	1/day

	Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
0.000E+00	560A	1	0.000E+00	0.000E+00	0.000E+00	1.50E+01
3.040E+02	560B	2	7.600E+01	1.105E+08	5.067E+00	1.50E+01
0.000E+00	560C	3	0.000E+00	0.000E+00	0.000E+00	1.50E+01
3.620E+02	560D	4	9.050E+01	1.315E+08	6.033E+00	1.50E+01
0.000E+00	570A	5	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	570B	6	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	570C	7	0.000E+00	0.000E+00	0.000E+00	1.50E+01
2.770E+03	570D	8	6.925E+02	1.007E+09	4.617E+01	1.50E+01
0.000E+00	570E	9	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	575A	10	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	575B	11	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	580A	12	0.000E+00	0.000E+00	0.000E+00	1.50E+01
2.130E+01	581A	13	5.325E+00	7.740E+06	3.550E−01	1.50E+01
6.630E+02	581B	14	1.408E+02	2.046E+08	9.383E+00	1.50E+01
4.760E+01	581C	15	1.190E+01	1.730E+07	7.933E−01	1.50E+01
0.000E+00	581D	16	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	582A	17	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	582B	18	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAA	19	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAB	20	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAC	21	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAD	22	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAE	23	0.000E+00	0.000E+00	0.000E+00	1.50E+01
2.220E+02	PAF	24	5.550E+01	8.067E+07	3.700E+00	1.50E+01
4.310E+04	PAG	25	1.078E+04	1.566E+10	7.183E+02	1.50E+01
9.940E+01	PAH	26	2.485E+01	3.612E+07	1.657E+00	1.50E+01
0.000E+00	PAI	27	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	WPAA	28	0.000E+00	0.000E+00	0.000E+00	1.50E+01

Initial Concentration Toxicity Screening Status Requires Modeling 15

Uranium – Total

CRU 5 RI

Initial Mass and Concentration

Sensitivity Analysis – 2

Compound Type	Rad	
Kd Vodose 1	1.50E+01	ml/g
Kd Vadose 2	1.78E+00	ml/g
Rd Vadose 1	1.65E+02	
Rd Vadose 2	1.72E+01	
Screening Level	8.93E−04	mg/l
Lambda	4.25E−13	1/day

	Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
0.000E+00	560A	1	0.000E+00	0.000E+00	0.000E+00	1.50E+01
3.040E+02	560B	2	3.040E+02	4.418E+08	1.369E+00	1.50E+01
0.000E+00	560C	3	0.000E+00	0.000E+00	0.000E+00	1.50E+01
3.620E+02	560D	4	3.620E+02	5.261E+08	1.631E+00	1.50E+01
0.000E+00	570A	5	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	570B	6	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	570C	7	0.000E+00	0.000E+00	0.000E+00	1.50E+01
2.770E+03	570D	8	2.770E+03	4.026E+09	1.248E+01	1.50E+01
0.000E+00	570E	9	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	575A	10	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	575B	11	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	580A	12	0.000E+00	0.000E+00	0.000E+00	1.50E+01
2.130E+01	581A	13	2.130E+01	3.096E+07	9.595E−02	1.50E+01
5.630E+02	581B	14	5.630E+02	8.183E+08	2.536E+00	1.50E+01
4.760E+01	581C	15	4.760E+01	6.918E+07	2.144E−01	1.50E+01
0.000E+00	581D	16	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	582A	17	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	582B	18	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAA	19	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAB	20	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAC	21	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAD	22	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	PAE	23	0.000E+00	0.000E+00	0.000E+00	1.50E+01
2.220E+02	PAF	24	2.220E+02	3.227E+08	1.000E+00	1.50E+01
4.310E+04	PAG	25	4.310E+04	6.264E+10	1.941E+02	1.50E+01
9.940E+01	PAH	26	9.940E+01	1.445E+08	4.477E−01	1.50E+01
0.000E+00	PAI	27	0.000E+00	0.000E+00	0.000E+00	1.50E+01
0.000E+00	WPAA	28	0.000E+00	0.000E+00	0.000E+00	1.50E+01

Initial Concentration Toxicity Screening Status Requires Modeling 15

Uranium – Total

CRU 5 RI

Initial Mass and Concentration

Sensitivity Analysis – 3

Compound Type	Rad	
Kd Vodose 1	1.50E+01	ml/g
Kd Vadose 2	1.78E+00	ml/g
Rd Vadose 1	1.65E+02	
Rd Vadose 2	1.72E+01	
Screening Level	8.93E−04	mg/l
Lambda	4.25E−13	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	222
560B	2	3.04E+02	4.418E+08	1.369E+00	222
560C	3	0.00E+00	0.000E+00	0.000E+00	15
560D	4	3.62E+02	5.261E+08	1.631E+00	222
570A	5	0.00E+00	0.000E+00	0.000E+00	222
570B	6	0.00E+00	0.000E+00	0.000E+00	222
570C	7	0.00E+00	0.000E+00	0.000E+00	222
570D	8	2.77E+03	4.026E+09	1.248E+01	222
570E	9	0.00E+00	0.000E+00	0.000E+00	222
575A	10	0.00E+00	0.000E+00	0.000E+00	222
575B	11	0.00E+00	0.000E+00	0.000E+00	222
580A	12	0.00E+00	0.000E+00	0.000E+00	222
581A	13	2.13E+01	3.096E+07	9.595E−02	222
581B	14	5.63E+02	8.183E+08	2.536E+00	222
581C	15	4.76E+01	6.918E+07	2.144E−01	222
581D	16	0.00E+00	0.000E+00	0.000E+00	15
582A	17	0.00E+00	0.000E+00	0.000E+00	222
582B	18	0.00E+00	0.000E+00	0.000E+00	222
PAA	19	0.00E+00	0.000E+00	0.000E+00	15
PAB	20	0.00E+00	0.000E+00	0.000E+00	15
PAC	21	0.00E+00	0.000E+00	0.000E+00	15
PAD	22	0.00E+00	0.000E+00	0.000E+00	15
PAE	23	0.00E+00	0.000E+00	0.000E+00	15
PAF	24	2.22E+02	3.227E+08	1.000E+00	222
PAG	25	4.31E+04	6.264E+10	1.941E+02	222
PAH	26	9.94E+01	1.445E+08	4.477E−01	222
PAI	27	0.00E+00	0.000E+00	0.000E+00	222
WPAA	28	0.00E+00	0.000E+00	0.000E+00	222

Initial Concentration Toxicity Screening Status Requires Modeling 15

- 6161

Uranium – Total

CRU 5 RI

Initial Mass and Concentration

Sensitivity Analysis – 4

Compound Type	Rad	
Kd Vodose 1	1.50E+01	ml/g
Kd Vadose 2	1.78E+00	ml/g
Rd Vadose 1	1.65E+02	
Rd Vadose 2	1.72E+01	
Screening Level	8.93E-04	mg/l
Lambda	4.25E-13	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 for Concentration (ml/g)	Kd Layer 1 for Retardation (ml/g)
560A	1	1.55E+01	2.253E+07	6.982E-02	222	15
560B	2	3.04E+02	4.418E+08	1.369E+00	222	15
560C	3	1.17E+03	1.701E+09	7.800E+01	15	15
560D	4	3.62E+02	5.261E+08	1.631E+00	222	15
570A	5	7.79E+01	1.132E+08	3.509E-01	222	15
570B	6	4.28E+02	6.221E+08	1.928E+00	222	15
570C	7	3.60E+01	5.232E+07	1.622E-01	222	15
570D	8	2.77E+03	4.026E+09	1.248E+01	222	15
570E	9	6.35E+01	9.229E+07	2.860E-01	222	15
575A	10	2.40E+01	3.488E+07	1.081E-01	222	15
575B	11	5.88E+01	8.546E+07	2.649E-01	222	15
580A	12	1.87E+01	2.718E+07	8.423E-02	222	15
581A	13	2.13E+01	3.096E+07	9.595E-02	222	15
581B	14	5.63E+02	8.183E+08	2.536E+00	222	15
581C	15	4.76E+01	6.918E+07	2.144E-01	222	15
581D	16	7.57E+03	1.100E+10	5.047E+02	15	15
582A	17	1.15E+01	1.671E+07	5.180E-02	222	15
582B	18	4.44E+02	6.453E+08	2.000E+00	222	15
PAA	19	1.23E+04	1.788E+10	8.200E+02	15	15
PAB	20	7.08E+02	1.029E+09	4.720E+01	15	15
PAC	21	2.00E+02	3.876E+09	1.333E+01	15	15
PAD	22	1.20E+02	1.279E+09	8.000E+00	15	15
PAE	23	5.87E+02	9.101E+09	3.913E+01	15	15
PAF	24	2.22E+02	3.227E+08	1.000E+00	222	15
PAG	25	4.31E+04	6.264E+10	1.941E+02	222	15
PAH	26	9.94E+01	1.445E+08	4.477E-01	222	15
PAI	27	4.17E+01	6.061E+07	1.878E-01	222	15
WPAA	28	3.74E+02	5.436E+08	1.685E+00	222	15

Initial Concentration Toxicity Screening Status Requires Modeling 15

1,1,1-Trichloroethane

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	1.64E+00	ml/g
Kd Vadose 2	3.09E-01	ml/g
Rd Vadose 1	1.89E+01	
Rd Vadose 2	3.81E+00	
Screening Level	1.51E-01	mg/l
Lambda	6.30E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	1.67265
560B	2	0.00E+00	0.000E+00	0.000E+00	1.650348
560C	3	0.00E+00	0.000E+00	0.000E+00	1.67265
560D	4	0.00E+00	0.000E+00	0.000E+00	1.63548
570A	5	0.00E+00	0.000E+00	0.000E+00	1.680084
570B	6	0.00E+00	0.000E+00	0.000E+00	1.70982
570C	7	0.00E+00	0.000E+00	0.000E+00	1.63548
570D	8	0.00E+00	0.000E+00	0.000E+00	1.63548
570E	9	0.00E+00	0.000E+00	0.000E+00	1.70982
575A	10	0.00E+00	0.000E+00	0.000E+00	1.67265
575B	11	0.00E+00	0.000E+00	0.000E+00	1.70982
580A	12	0.00E+00	0.000E+00	0.000E+00	1.67265
581A	13	4.70E-02	6.831E+04	2.874E-02	1.63548
581B	14	0.00E+00	0.000E+00	0.000E+00	1.63548
581C	15	0.00E+00	0.000E+00	0.000E+00	1.590876
581D	16	0.00E+00	0.000E+00	0.000E+00	1.63548
582A	17	0.00E+00	0.000E+00	0.000E+00	1.590876
582B	18	0.00E+00	0.000E+00	0.000E+00	1.63548
PAA	19	1.00E-03	1.453E+03	6.114E-04	1.63548
PAB	20	1.20E-01	1.744E+05	7.337E-02	1.63548
PAC	21	6.00E-03	1.163E+05	3.669E-03	1.63548
PAD	22	6.70E-02	7.141E+05	4.097E-02	1.63548
PAE	23	1.90E-02	2.946E+05	1.162E-02	1.63548
PAF	24	0.00E+00	0.000E+00	0.000E+00	1.63548
PAG	25	1.00E-03	1.453E+03	6.114E-04	1.63548
PAH	26	2.00E-03	2.907E+03	1.223E-03	1.63548
PAI	27	0.00E+00	0.000E+00	0.000E+00	1.63548
WPAA	28	1.00E-03	1.453E+03	6.114E-04	1.63548

Initial Concentration Toxicity Screening Status

1,1,2-trichloroethane

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	1.64E+00	ml/g
Kd Vadose 2	3.09E-01	ml/g
Rd Vadose 1	1.89E+01	
Rd Vadose 2	3.81E+00	
Screening Level	3.20E-05	mg/l
Lambda	4.70E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	1.67265
560B	2	0.00E+00	0.000E+00	0.000E+00	1.650348
560C	3	0.00E+00	0.000E+00	0.000E+00	1.67265
560D	4	0.00E+00	0.000E+00	0.000E+00	1.63548
570A	5	0.00E+00	0.000E+00	0.000E+00	1.680084
570B	6	0.00E+00	0.000E+00	0.000E+00	1.70982
570C	7	0.00E+00	0.000E+00	0.000E+00	1.63548
570D	8	0.00E+00	0.000E+00	0.000E+00	1.63548
570E	9	0.00E+00	0.000E+00	0.000E+00	1.70982
575A	10	0.00E+00	0.000E+00	0.000E+00	1.67265
575B	11	0.00E+00	0.000E+00	0.000E+00	1.70982
580A	12	0.00E+00	0.000E+00	0.000E+00	1.67265
581A	13	0.00E+00	0.000E+00	0.000E+00	1.63548
581B	14	0.00E+00	0.000E+00	0.000E+00	1.63548
581C	15	0.00E+00	0.000E+00	0.000E+00	1.590876
581D	16	0.00E+00	0.000E+00	0.000E+00	1.63548
582A	17	0.00E+00	0.000E+00	0.000E+00	1.590876
582B	18	0.00E+00	0.000E+00	0.000E+00	1.63548
PAA	19	0.00E+00	0.000E+00	0.000E+00	1.63548
PAB	20	0.00E+00	0.000E+00	0.000E+00	1.63548
PAC	21	0.00E+00	0.000E+00	0.000E+00	1.63548
PAD	22	1.40E-02	1.492E+05	8.560E-03	1.63548
PAE	23	2.00E-03	3.101E+04	1.223E-03	1.63548
PAF	24	0.00E+00	0.000E+00	0.000E+00	1.63548
PAG	25	0.00E+00	0.000E+00	0.000E+00	1.63548
PAH	26	0.00E+00	0.000E+00	0.000E+00	1.63548
PAI	27	0.00E+00	0.000E+00	0.000E+00	1.63548
WPAA	28	0.00E+00	0.000E+00	0.000E+00	1.63548

Initial Concentration Toxicity Screening Status Requires Modeling 21

1,1 – Dichloroethane

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org–V	
Kd Vodose 1	3.42E–01	ml/g
Kd Vadose 2	6.45E–02	ml/g
Rd Vadose 1	4.75E+00	
Rd Vadose 2	1.59E+00	
Screening Level	9.70E–02	mg/l
Lambda	1.13E–03	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.349839
560B	2	0.00E+00	0.000E+00	0.000E+00	0.34517448
560C	3	0.00E+00	0.000E+00	0.000E+00	0.349839
560D	4	0.00E+00	0.000E+00	0.000E+00	0.3420648
570A	5	0.00E+00	0.000E+00	0.000E+00	0.35139384
570B	6	0.00E+00	0.000E+00	0.000E+00	0.3576132
570C	7	0.00E+00	0.000E+00	0.000E+00	0.3420648
570D	8	0.00E+00	0.000E+00	0.000E+00	0.3420648
570E	9	0.00E+00	0.000E+00	0.000E+00	0.3576132
575A	10	0.00E+00	0.000E+00	0.000E+00	0.349839
575B	11	0.00E+00	0.000E+00	0.000E+00	0.3576132
580A	12	0.00E+00	0.000E+00	0.000E+00	0.349839
581A	13	9.00E–03	1.308E+04	2.631E–02	0.3420648
581B	14	0.00E+00	0.000E+00	0.000E+00	0.3420648
581C	15	0.00E+00	0.000E+00	0.000E+00	0.33273576
581D	16	0.00E+00	0.000E+00	0.000E+00	0.3420648
582A	17	0.00E+00	0.000E+00	0.000E+00	0.33273576
582B	18	0.00E+00	0.000E+00	0.000E+00	0.3420648
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.3420648
PAB	20	1.00E–03	1.453E+03	2.923E–03	0.3420648
PAC	21	1.40E–02	2.713E+05	4.093E–02	0.3420648
PAD	22	3.70E–02	3.944E+05	1.082E–01	0.3420648
PAE	23	1.00E–03	1.550E+04	2.923E–03	0.3420648
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.3420648
PAG	25	4.00E–03	5.814E+03	1.169E–02	0.3420648
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.3420648
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.3420648
WPAA	28	2.00E–03	2.907E+03	5.847E–03	0.3420648

Initial Concentration Toxicity Screening Status Requires Modeling 22

1,1 – Dichloroethene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org–V	
Kd Vodose 1	1.67E–01	ml/g
Kd Vadose 2	3.16E–02	ml/g
Rd Vadose 1	2.83E+00	
Rd Vadose 2	1.29E+00	
Screening Level	6.70E–06	mg/l
Lambda	3.85E–03	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.171234
560B	2	0.00E+00	0.000E+00	0.000E+00	0.16895088
560C	3	0.00E+00	0.000E+00	0.000E+00	0.171234
560D	4	0.00E+00	0.000E+00	0.000E+00	0.1674288
570A	5	0.00E+00	0.000E+00	0.000E+00	0.17199504
570B	6	0.00E+00	0.000E+00	0.000E+00	0.1750392
570C	7	0.00E+00	0.000E+00	0.000E+00	0.1674288
570D	8	0.00E+00	0.000E+00	0.000E+00	0.1674288
570E	9	0.00E+00	0.000E+00	0.000E+00	0.1750392
575A	10	0.00E+00	0.000E+00	0.000E+00	0.171234
575B	11	0.00E+00	0.000E+00	0.000E+00	0.1750392
580A	12	0.00E+00	0.000E+00	0.000E+00	0.171234
581A	13	6.00E–03	8.721E+03	3.584E–02	0.1674288
581B	14	0.00E+00	0.000E+00	0.000E+00	0.1674288
581C	15	0.00E+00	0.000E+00	0.000E+00	0.16286256
581D	16	0.00E+00	0.000E+00	0.000E+00	0.1674288
582A	17	0.00E+00	0.000E+00	0.000E+00	0.16286256
582B	18	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAB	20	3.90E–02	5.668E+04	2.329E–01	0.1674288
PAC	21	2.00E–03	3.876E+04	1.195E–02	0.1674288
PAD	22	5.00E–03	5.329E+04	2.986E–02	0.1674288
PAE	23	6.00E–03	9.302E+04	3.584E–02	0.1674288
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAG	25	4.00E–03	5.814E+03	2.389E–02	0.1674288
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.1674288
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.1674288

Initial Concentration Toxicity Screening Status Requires Modeling 23

1,2-Dichloroethene (tot)

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	1.67E-01	ml/g
Kd Vadose 2	3.16E-02	ml/g
Rd Vadose 1	2.83E+00	
Rd Vadose 2	1.29E+00	
Screening Level	3.70E-02	mg/l
Lambda	9.50E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.171234
560B	2	0.00E+00	0.000E+00	0.000E+00	0.16895088
560C	3	0.00E+00	0.000E+00	0.000E+00	0.171234
560D	4	0.00E+00	0.000E+00	0.000E+00	0.1674288
570A	5	0.00E+00	0.000E+00	0.000E+00	0.17199504
570B	6	0.00E+00	0.000E+00	0.000E+00	0.1750392
570C	7	0.00E+00	0.000E+00	0.000E+00	0.1674288
570D	8	0.00E+00	0.000E+00	0.000E+00	0.1674288
570E	9	0.00E+00	0.000E+00	0.000E+00	0.1750392
575A	10	0.00E+00	0.000E+00	0.000E+00	0.171234
575B	11	0.00E+00	0.000E+00	0.000E+00	0.1750392
580A	12	0.00E+00	0.000E+00	0.000E+00	0.171234
581A	13	0.00E+00	0.000E+00	0.000E+00	0.1674288
581B	14	0.00E+00	0.000E+00	0.000E+00	0.1674288
581C	15	0.00E+00	0.000E+00	0.000E+00	0.16286256
581D	16	0.00E+00	0.000E+00	0.000E+00	0.1674288
582A	17	0.00E+00	0.000E+00	0.000E+00	0.16286256
582B	18	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAB	20	4.00E-03	5.814E+03	2.389E-02	0.1674288
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAD	22	3.40E-01	3.624E+06	2.031E+00	0.1674288
PAE	23	2.00E-02	3.101E+05	1.195E-01	0.1674288
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAG	25	1.90E-02	2.762E+04	1.135E-01	0.1674288
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.1674288
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.1674288
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.1674288

Initial Concentration Toxicity Screening Status Requires Modeling 24

2-hexanone

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	1.33E-01	ml/g
Kd Vadose 2	2.51E-02	ml/g
Rd Vadose 1	2.46E+00	
Rd Vadose 2	1.23E+00	
Screening Level	1.46E-01	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	2.00E-03	2.907E+03	1.503E-02	0.13608
560B	2	0.00E+00	0.000E+00	0.000E+00	0.1342656
560C	3	0.00E+00	0.000E+00	0.000E+00	0.13608
560D	4	0.00E+00	0.000E+00	0.000E+00	0.133056
570A	5	0.00E+00	0.000E+00	0.000E+00	0.1366848
570B	6	0.00E+00	0.000E+00	0.000E+00	0.139104
570C	7	0.00E+00	0.000E+00	0.000E+00	0.133056
570D	8	0.00E+00	0.000E+00	0.000E+00	0.133056
570E	9	0.00E+00	0.000E+00	0.000E+00	0.139104
575A	10	0.00E+00	0.000E+00	0.000E+00	0.13608
575B	11	0.00E+00	0.000E+00	0.000E+00	0.139104
580A	12	0.00E+00	0.000E+00	0.000E+00	0.13608
581A	13	0.00E+00	0.000E+00	0.000E+00	0.133056
581B	14	0.00E+00	0.000E+00	0.000E+00	0.133056
581C	15	0.00E+00	0.000E+00	0.000E+00	0.1294272
581D	16	0.00E+00	0.000E+00	0.000E+00	0.133056
582A	17	0.00E+00	0.000E+00	0.000E+00	0.1294272
582B	18	0.00E+00	0.000E+00	0.000E+00	0.133056
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.133056
PAB	20	2.00E-03	2.907E+03	1.503E-02	0.133056
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.133056
PAD	22	1.00E-03	1.066E+04	7.516E-03	0.133056
PAE	23	1.00E-03	1.550E+04	7.516E-03	0.133056
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.133056
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.133056
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.133056
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.133056
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.133056

Initial Concentration Toxicity Screening Status

Benzene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	7.48E-01	ml/g
Kd Vadose 2	1.41E-01	ml/g
Rd Vadose 1	9.20E+00	
Rd Vadose 2	2.28E+00	
Screening Level	6.20E-05	mg/l
Lambda	9.50E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	3.00E-03	4.360E+03	4.008E-03	0.76545
560B	2	0.00E+00	0.000E+00	0.000E+00	0.755244
560C	3	0.00E+00	0.000E+00	0.000E+00	0.76545
560D	4	0.00E+00	0.000E+00	0.000E+00	0.74844
570A	5	0.00E+00	0.000E+00	0.000E+00	0.768852
570B	6	0.00E+00	0.000E+00	0.000E+00	0.78246
570C	7	0.00E+00	0.000E+00	0.000E+00	0.74844
570D	8	0.00E+00	0.000E+00	0.000E+00	0.74844
570E	9	0.00E+00	0.000E+00	0.000E+00	0.78246
575A	10	0.00E+00	0.000E+00	0.000E+00	0.76545
575B	11	0.00E+00	0.000E+00	0.000E+00	0.78246
580A	12	0.00E+00	0.000E+00	0.000E+00	0.76545
581A	13	0.00E+00	0.000E+00	0.000E+00	0.74844
581B	14	0.00E+00	0.000E+00	0.000E+00	0.74844
581C	15	0.00E+00	0.000E+00	0.000E+00	0.728028
581D	16	0.00E+00	0.000E+00	0.000E+00	0.74844
582A	17	0.00E+00	0.000E+00	0.000E+00	0.728028
582B	18	0.00E+00	0.000E+00	0.000E+00	0.74844
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.74844
PAB	20	2.00E-03	2.907E+03	2.672E-03	0.74844
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.74844
PAD	22	1.00E-03	1.066E+04	1.336E-03	0.74844
PAE	23	6.67E-02	1.034E+06	8.912E-02	0.74844
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.74844
PAG	25	5.00E-03	7.267E+03	6.681E-03	0.74844
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.74844
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.74844
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.74844

Initial Concentration Toxicity Screening Status Requires Modeling 29

Tetrachloroethene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	1.88E+00	ml/g
Kd Vadose 2	3.55E-01	ml/g
Rd Vadose 1	2.16E+01	
Rd Vadose 2	4.22E+00	
Screening Level	3.70E-02	mg/l
Lambda	4.20E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	2.00E-03	2.907E+03	1.064E-03	1.92213
560B	2	0.00E+00	0.000E+00	0.000E+00	1.8965016
560C	3	1.70E-01	2.471E+05	9.045E-02	1.92213
560D	4	0.00E+00	0.000E+00	0.000E+00	1.879416
570A	5	0.00E+00	0.000E+00	0.000E+00	1.9306728
570B	6	0.00E+00	0.000E+00	0.000E+00	1.964844
570C	7	0.00E+00	0.000E+00	0.000E+00	1.879416
570D	8	0.00E+00	0.000E+00	0.000E+00	1.879416
570E	9	0.00E+00	0.000E+00	0.000E+00	1.964844
575A	10	0.00E+00	0.000E+00	0.000E+00	1.92213
575B	11	0.00E+00	0.000E+00	0.000E+00	1.964844
580A	12	0.00E+00	0.000E+00	0.000E+00	1.92213
581A	13	1.00E-03	1.453E+03	5.321E-04	1.879416
581B	14	0.00E+00	0.000E+00	0.000E+00	1.879416
581C	15	0.00E+00	0.000E+00	0.000E+00	1.8281592
581D	16	0.00E+00	0.000E+00	0.000E+00	1.879416
582A	17	3.00E-03	4.360E+03	1.596E-03	1.8281592
582B	18	2.00E-03	2.907E+03	1.064E-03	1.879416
PAA	19	3.00E-03	4.360E+03	1.596E-03	1.879416
PAB	20	1.40E-01	2.035E+05	7.449E-02	1.879416
PAC	21	2.00E-03	3.876E+04	1.064E-03	1.879416
PAD	22	1.60E+00	1.705E+07	8.513E-01	1.879416
PAE	23	3.00E-03	4.651E+04	1.596E-03	1.879416
PAF	24	0.00E+00	0.000E+00	0.000E+00	1.879416
PAG	25	5.20E-02	7.558E+04	2.767E-02	1.879416
PAH	26	0.00E+00	0.000E+00	0.000E+00	1.879416
PAI	27	0.00E+00	0.000E+00	0.000E+00	1.879416
WPAA	28	0.00E+00	0.000E+00	0.000E+00	1.879416

Initial Concentration Toxicity Screening Status Requires Modeling 38

Trichloroethene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-V	
Kd Vodose 1	1.88E+00	ml/g
Kd Vadose 2	3.55E-01	ml/g
Rd Vadose 1	2.16E+01	
Rd Vadose 2	4.22E+00	
Screening Level	2.50E-04	mg/l
Lambda	4.20E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	4.00E-03	5.814E+03	2.128E-03	1.92213
560B	2	0.00E+00	0.000E+00	0.000E+00	1.8965016
560C	3	0.00E+00	0.000E+00	0.000E+00	1.92213
560D	4	0.00E+00	0.000E+00	0.000E+00	1.879416
570A	5	0.00E+00	0.000E+00	0.000E+00	1.9306728
570B	6	0.00E+00	0.000E+00	0.000E+00	1.964844
570C	7	0.00E+00	0.000E+00	0.000E+00	1.879416
570D	8	0.00E+00	0.000E+00	0.000E+00	1.879416
570E	9	0.00E+00	0.000E+00	0.000E+00	1.964844
575A	10	0.00E+00	0.000E+00	0.000E+00	1.92213
575B	11	0.00E+00	0.000E+00	0.000E+00	1.964844
580A	12	0.00E+00	0.000E+00	0.000E+00	1.92213
581A	13	0.00E+00	0.000E+00	0.000E+00	1.879416
581B	14	0.00E+00	0.000E+00	0.000E+00	1.879416
581C	15	0.00E+00	0.000E+00	0.000E+00	1.8281592
581D	16	0.00E+00	0.000E+00	0.000E+00	1.879416
582A	17	2.00E-03	2.907E+03	1.064E-03	1.8281592
582B	18	0.00E+00	0.000E+00	0.000E+00	1.879416
PAA	19	0.00E+00	0.000E+00	0.000E+00	1.879416
PAB	20	5.20E-02	7.558E+04	2.767E-02	1.879416
PAC	21	0.00E+00	0.000E+00	0.000E+00	1.879416
PAD	22	8.90E+01	9.486E+08	4.736E+01	1.879416
PAE	23	2.90E-01	4.496E+06	1.543E-01	1.879416
PAF	24	0.00E+00	0.000E+00	0.000E+00	1.879416
PAG	25	3.40E-02	4.942E+04	1.809E-02	1.879416
PAH	26	1.80E-02	2.616E+04	9.577E-03	1.879416
PAI	27	0.00E+00	0.000E+00	0.000E+00	1.879416
WPAA	28	6.00E-03	8.721E+03	3.192E-03	1.879416

Initial Concentration Toxicity Screening Status Requires Modeling 40

2-methylnaphthalene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-S	
Kd Vodose 1	4.01E+01	ml/g
Kd Vadose 2	7.57E+00	ml/g
Rd Vadose 1	4.41E+02	
Rd Vadose 2	6.98E+01	
Screening Level	1.46E-01	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	41.0508
560B	2	3.50E-01	5.087E+05	8.720E-03	40.503456
560C	3	0.00E+00	0.000E+00	0.000E+00	41.0508
560D	4	0.00E+00	0.000E+00	0.000E+00	40.13856
570A	5	0.00E+00	0.000E+00	0.000E+00	41.233248
570B	6	0.00E+00	0.000E+00	0.000E+00	41.96304
570C	7	0.00E+00	0.000E+00	0.000E+00	40.13856
570D	8	0.00E+00	0.000E+00	0.000E+00	40.13856
570E	9	0.00E+00	0.000E+00	0.000E+00	41.96304
575A	10	0.00E+00	0.000E+00	0.000E+00	41.0508
575B	11	0.00E+00	0.000E+00	0.000E+00	41.96304
580A	12	0.00E+00	0.000E+00	0.000E+00	41.0508
581A	13	0.00E+00	0.000E+00	0.000E+00	40.13856
581B	14	2.50E-02	3.634E+04	6.228E-04	40.13856
581C	15	0.00E+00	0.000E+00	0.000E+00	39.043872
581D	16	0.00E+00	0.000E+00	0.000E+00	40.13856
582A	17	0.00E+00	0.000E+00	0.000E+00	39.043872
582B	18	0.00E+00	0.000E+00	0.000E+00	40.13856
PAA	19	0.00E+00	0.000E+00	0.000E+00	40.13856
PAB	20	1.30E+00	1.889E+06	3.239E-02	40.13856
PAC	21	0.00E+00	0.000E+00	0.000E+00	40.13856
PAD	22	3.20E-01	3.411E+06	7.972E-03	40.13856
PAE	23	4.90E-02	7.597E+05	1.221E-03	40.13856
PAF	24	0.00E+00	0.000E+00	0.000E+00	40.13856
PAG	25	5.80E-02	8.430E+04	1.445E-03	40.13856
PAH	26	5.10E-01	7.413E+05	1.271E-02	40.13856
PAI	27	0.00E+00	0.000E+00	0.000E+00	40.13856
WPAA	28	7.40E-01	1.076E+06	1.844E-02	40.13856

Initial Concentration Toxicity Screening Status

Diethylphthalate

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-S	
Kd Vodose 1	4.11E-01	ml/g
Kd Vadose 2	7.75E-02	ml/g
Rd Vadose 1	5.50E+00	
Rd Vadose 2	1.70E+00	
Screening Level	2.92E+00	mg/l
Lambda	3.09E-03	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	1.6733304
560B	2	0.00E+00	0.000E+00	0.000E+00	1.651019328
560C	3	0.00E+00	0.000E+00	0.000E+00	1.6733304
560D	4	0.00E+00	0.000E+00	0.000E+00	1.63614528
570A	5	0.00E+00	0.000E+00	0.000E+00	1.680767424
570B	6	0.00E+00	0.000E+00	0.000E+00	1.71051552
570C	7	0.00E+00	0.000E+00	0.000E+00	1.63614528
570D	8	0.00E+00	0.000E+00	0.000E+00	1.63614528
570E	9	0.00E+00	0.000E+00	0.000E+00	1.71051552
575A	10	1.40E-02	2.035E+04	3.408E-02	1.6733304
575B	11	0.00E+00	0.000E+00	0.000E+00	1.71051552
580A	12	0.00E+00	0.000E+00	0.000E+00	1.6733304
581A	13	0.00E+00	0.000E+00	0.000E+00	1.63614528
581B	14	0.00E+00	0.000E+00	0.000E+00	1.63614528
581C	15	0.00E+00	0.000E+00	0.000E+00	1.591523136
581D	16	0.00E+00	0.000E+00	0.000E+00	1.63614528
582A	17	0.00E+00	0.000E+00	0.000E+00	1.591523136
582B	18	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAA	19	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAB	20	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAC	21	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAD	22	1.00E-03	1.066E+04	2.434E-03	1.63614528
PAE	23	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAF	24	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAG	25	0.00E+00	0.000E+00	0.000E+00	1.63614528
PAH	26	5.20E-02	7.558E+04	1.266E-01	1.63614528
PAI	27	0.00E+00	0.000E+00	0.000E+00	1.63614528
WPAA	28	0.00E+00	0.000E+00	0.000E+00	1.63614528

Initial Concentration Toxicity Screening Status

Carbazole

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-S	
Kd Vodose 1	1.08E+01	ml/g
Kd Vadose 2	2.04E+00	ml/g
Rd Vadose 1	1.19E+02	
Rd Vadose 2	1.95E+01	
Screening Level	4.30E-04	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	11.0565
560B	2	0.00E+00	0.000E+00	0.000E+00	10.90908
560C	3	0.00E+00	0.000E+00	0.000E+00	11.0565
560D	4	0.00E+00	0.000E+00	0.000E+00	10.8108
570A	5	0.00E+00	0.000E+00	0.000E+00	11.10564
570B	6	0.00E+00	0.000E+00	0.000E+00	11.3022
570C	7	4.60E-02	6.686E+04	4.255E-03	10.8108
570D	8	4.60E-02	6.686E+04	4.255E-03	10.8108
570E	9	0.00E+00	0.000E+00	0.000E+00	11.3022
575A	10	7.00E-03	1.017E+04	6.475E-04	11.0565
575B	11	0.00E+00	0.000E+00	0.000E+00	11.3022
580A	12	7.00E-03	1.017E+04	6.475E-04	11.0565
581A	13	0.00E+00	0.000E+00	0.000E+00	10.8108
581B	14	0.00E+00	0.000E+00	0.000E+00	10.8108
581C	15	0.00E+00	0.000E+00	0.000E+00	10.51596
581D	16	0.00E+00	0.000E+00	0.000E+00	10.8108
582A	17	0.00E+00	0.000E+00	0.000E+00	10.51596
582B	18	0.00E+00	0.000E+00	0.000E+00	10.8108
PAA	19	0.00E+00	0.000E+00	0.000E+00	10.8108
PAB	20	6.50E-02	9.447E+04	6.013E-03	10.8108
PAC	21	4.80E-02	9.302E+05	4.440E-03	10.8108
PAD	22	0.00E+00	0.000E+00	0.000E+00	10.8108
PAE	23	7.30E-02	1.132E+06	6.753E-03	10.8108
PAF	24	2.50E-01	3.634E+05	2.313E-02	10.8108
PAG	25	7.40E-02	1.076E+05	6.845E-03	10.8108
PAH	26	1.40E-01	2.035E+05	1.295E-02	10.8108
PAI	27	0.00E+00	0.000E+00	0.000E+00	10.8108
WPAA	28	7.60E-02	1.105E+05	7.030E-03	10.8108

Initial Concentration Toxicity Screening Status Requires Modeling 75

Alpha-chlordane

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-P	
Kd Vodose 1	3.34E+00	ml/g
Kd Vadose 2	6.31E-01	ml/g
Rd Vadose 1	3.76E+01	
Rd Vadose 2	6.73E+00	
Screening Level	6.60E-06	mg/l
Lambda	1.00E-51	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	3.41901
560B	2	0.00E+00	0.000E+00	0.000E+00	3.3734232
560C	3	0.00E+00	0.000E+00	0.000E+00	3.41901
560D	4	0.00E+00	0.000E+00	0.000E+00	3.343032
570A	5	0.00E+00	0.000E+00	0.000E+00	3.4342056
570B	6	0.00E+00	0.000E+00	0.000E+00	3.494988
570C	7	0.00E+00	0.000E+00	0.000E+00	3.343032
570D	8	0.00E+00	0.000E+00	0.000E+00	3.343032
570E	9	0.00E+00	0.000E+00	0.000E+00	3.494988
575A	10	0.00E+00	0.000E+00	0.000E+00	3.41901
575B	11	0.00E+00	0.000E+00	0.000E+00	3.494988
580A	12	0.00E+00	0.000E+00	0.000E+00	3.41901
581A	13	0.00E+00	0.000E+00	0.000E+00	3.343032
581B	14	0.00E+00	0.000E+00	0.000E+00	3.343032
581C	15	0.00E+00	0.000E+00	0.000E+00	3.2518584
581D	16	0.00E+00	0.000E+00	0.000E+00	3.343032
582A	17	0.00E+00	0.000E+00	0.000E+00	3.2518584
582B	18	0.00E+00	0.000E+00	0.000E+00	3.343032
PAA	19	5.10E-03	7.413E+03	1.526E-03	3.343032
PAB	20	0.00E+00	0.000E+00	0.000E+00	3.343032
PAC	21	0.00E+00	0.000E+00	0.000E+00	3.343032
PAD	22	0.00E+00	0.000E+00	0.000E+00	3.343032
PAE	23	0.00E+00	0.000E+00	0.000E+00	3.343032
PAF	24	0.00E+00	0.000E+00	0.000E+00	3.343032
PAG	25	0.00E+00	0.000E+00	0.000E+00	3.343032
PAH	26	0.00E+00	0.000E+00	0.000E+00	3.343032
PAI	27	2.80E-03	4.070E+03	8.376E-04	3.343032
WPAA	28	0.00E+00	0.000E+00	0.000E+00	3.343032

Initial Concentration Toxicity Screening Status Requires Modeling 80

Heptachlor Epoxide

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-P	
Kd Vodose 1	2.49E+00	ml/g
Kd Vadose 2	4.71E-01	ml/g
Rd Vadose 1	2.83E+01	
Rd Vadose 2	5.28E+00	
Screening Level	2.00E-07	mg/l
Lambda	6.28E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	2.5515
560B	2	0.00E+00	0.000E+00	0.000E+00	2.51748
560C	3	0.00E+00	0.000E+00	0.000E+00	2.5515
560D	4	0.00E+00	0.000E+00	0.000E+00	2.4948
570A	5	0.00E+00	0.000E+00	0.000E+00	2.56284
570B	6	0.00E+00	0.000E+00	0.000E+00	2.6082
570C	7	0.00E+00	0.000E+00	0.000E+00	2.4948
570D	8	0.00E+00	0.000E+00	0.000E+00	2.4948
570E	9	0.00E+00	0.000E+00	0.000E+00	2.6082
575A	10	0.00E+00	0.000E+00	0.000E+00	2.5515
575B	11	0.00E+00	0.000E+00	0.000E+00	2.6082
580A	12	0.00E+00	0.000E+00	0.000E+00	2.5515
581A	13	0.00E+00	0.000E+00	0.000E+00	2.4948
581B	14	0.00E+00	0.000E+00	0.000E+00	2.4948
581C	15	0.00E+00	0.000E+00	0.000E+00	2.42676
581D	16	0.00E+00	0.000E+00	0.000E+00	2.4948
582A	17	0.00E+00	0.000E+00	0.000E+00	2.42676
582B	18	0.00E+00	0.000E+00	0.000E+00	2.4948
PAA	19	1.00E-03	1.453E+03	4.008E-04	2.4948
PAB	20	0.00E+00	0.000E+00	0.000E+00	2.4948
PAC	21	0.00E+00	0.000E+00	0.000E+00	2.4948
PAD	22	0.00E+00	0.000E+00	0.000E+00	2.4948
PAE	23	0.00E+00	0.000E+00	0.000E+00	2.4948
PAF	24	0.00E+00	0.000E+00	0.000E+00	2.4948
PAG	25	0.00E+00	0.000E+00	0.000E+00	2.4948
PAH	26	0.00E+00	0.000E+00	0.000E+00	2.4948
PAI	27	2.80E-03	4.070E+03	1.122E-03	2.4948
WPAA	28	0.00E+00	0.000E+00	0.000E+00	2.4948

Initial Concentration Toxicity Screening Status Requires Modeling 88

Endrin Aldehyde

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org-P	
Kd Vodose 1	7.76E+00	ml/g
Kd Vadose 2	1.46E+00	ml/g
Rd Vadose 1	8.60E+01	
Rd Vadose 2	1.43E+01	
Screening Level	1.10E-03	mg/l
Lambda	1.00E-51	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	7.938
560B	2	1.50E-02	2.180E+04	1.933E-03	7.83216
560C	3	0.00E+00	0.000E+00	0.000E+00	7.938
560D	4	0.00E+00	0.000E+00	0.000E+00	7.7616
570A	5	0.00E+00	0.000E+00	0.000E+00	7.97328
570B	6	0.00E+00	0.000E+00	0.000E+00	8.1144
570C	7	0.00E+00	0.000E+00	0.000E+00	7.7616
570D	8	0.00E+00	0.000E+00	0.000E+00	7.7616
570E	9	0.00E+00	0.000E+00	0.000E+00	8.1144
575A	10	0.00E+00	0.000E+00	0.000E+00	7.938
575B	11	0.00E+00	0.000E+00	0.000E+00	8.1144
580A	12	0.00E+00	0.000E+00	0.000E+00	7.938
581A	13	0.00E+00	0.000E+00	0.000E+00	7.7616
581B	14	0.00E+00	0.000E+00	0.000E+00	7.7616
581C	15	0.00E+00	0.000E+00	0.000E+00	7.54992
581D	16	0.00E+00	0.000E+00	0.000E+00	7.7616
582A	17	0.00E+00	0.000E+00	0.000E+00	7.54992
582B	18	0.00E+00	0.000E+00	0.000E+00	7.7616
PAA	19	0.00E+00	0.000E+00	0.000E+00	7.7616
PAB	20	0.00E+00	0.000E+00	0.000E+00	7.7616
PAC	21	0.00E+00	0.000E+00	0.000E+00	7.7616
PAD	22	0.00E+00	0.000E+00	0.000E+00	7.7616
PAE	23	0.00E+00	0.000E+00	0.000E+00	7.7616
PAF	24	0.00E+00	0.000E+00	0.000E+00	7.7616
PAG	25	0.00E+00	0.000E+00	0.000E+00	7.7616
PAH	26	0.00E+00	0.000E+00	0.000E+00	7.7616
PAI	27	0.00E+00	0.000E+00	0.000E+00	7.7616
WPAA	28	0.00E+00	0.000E+00	0.000E+00	7.7616

Initial Concentration Toxicity Screening Status Requires Modeling 89

Antimony

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	2.50E+02	ml/g
Kd Vadose 2	4.50E+01	ml/g
Rd Vadose 1	2.74E+03	
Rd Vadose 2	4.10E+02	
Screening Level	1.50E−03	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	3.200E+00	4.651E+06	1.280E−02	2.50E+02
560B	2	2.640E+01	3.837E+07	1.056E−01	2.50E+02
560C	3	7.600E−01	1.105E+06	3.040E−03	2.50E+02
560D	4	7.600E−01	1.105E+06	3.040E−03	2.50E+02
570A	5	7.600E−01	1.105E+06	3.040E−03	2.50E+02
570B	6	2.740E+01	3.982E+07	1.096E−01	2.50E+02
570C	7	2.640E+01	3.837E+07	1.056E−01	2.50E+02
570D	8	2.640E+01	3.837E+07	1.056E−01	2.50E+02
570E	9	7.600E−01	1.105E+06	3.040E−03	2.50E+02
575A	10	7.600E−01	1.105E+06	3.040E−03	2.50E+02
575B	11	7.600E−01	1.105E+06	3.040E−03	2.50E+02
580A	12	7.600E−01	1.105E+06	3.040E−03	2.50E+02
581A	13	4.100E+00	5.959E+06	1.640E−02	2.50E+02
581B	14	2.150E+01	3.125E+07	8.600E−02	2.50E+02
581C	15	7.600E−01	1.105E+06	3.040E−03	2.50E+02
581D	16	2.900E+00	4.215E+06	1.160E−02	2.50E+02
582A	17	7.600E−01	1.105E+06	3.040E−03	2.50E+02
582B	18	7.600E−01	1.105E+06	3.040E−03	2.50E+02
PAA	19	3.810E+01	5.538E+07	1.524E−01	2.50E+02
PAB	20	7.600E−01	1.105E+06	3.040E−03	2.50E+02
PAC	21	1.200E+00	2.326E+07	4.800E−03	2.50E+02
PAD	22	7.600E−01	8.101E+06	3.040E−03	2.50E+02
PAE	23	2.200E+01	3.411E+08	8.800E−02	2.50E+02
PAF	24	7.600E−01	1.105E+06	3.040E−03	2.50E+02
PAG	25	7.600E−01	1.105E+06	3.040E−03	2.50E+02
PAH	26	7.600E−01	1.105E+06	3.040E−03	2.50E+02
PAI	27	7.600E−01	1.105E+06	3.040E−03	2.50E+02
WPAA	28	3.250E+01	4.724E+07	1.300E−01	2.50E+02

Initial Concentration Toxicity Screening Status Requires Modeling 94

Arsenic

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	2.00E+02	ml/g
Kd Vadose 2	2.00E+02	ml/g
Rd Vadose 1	2.19E+03	
Rd Vadose 2	1.82E+03	
Screening Level	4.90E−06	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.210E+01	1.759E+07	6.050E−02	2.00E+02
560B	2	8.820E+00	1.282E+07	4.410E−02	2.00E+02
560C	3	5.660E+00	8.227E+06	2.830E−02	2.00E+02
560D	4	7.300E+00	1.061E+07	3.650E−02	2.00E+02
570A	5	2.600E+01	3.779E+07	1.300E−01	2.00E+02
570B	6	3.250E+01	4.724E+07	1.625E−01	2.00E+02
570C	7	6.230E+00	9.055E+06	3.115E−02	2.00E+02
570D	8	6.230E+00	9.055E+06	3.115E−02	2.00E+02
570E	9	3.250E+01	4.724E+07	1.625E−01	2.00E+02
575A	10	7.300E+00	1.061E+07	3.650E−02	2.00E+02
575B	11	3.700E+00	5.378E+06	1.850E−02	2.00E+02
580A	12	6.500E+00	9.447E+06	3.250E−02	2.00E+02
581A	13	9.840E+00	1.430E+07	4.920E−02	2.00E+02
581B	14	6.160E+00	8.953E+06	3.080E−02	2.00E+02
581C	15	3.300E+00	4.796E+06	1.650E−02	2.00E+02
581D	16	6.900E+00	1.003E+07	3.450E−02	2.00E+02
582A	17	8.590E+00	1.249E+07	4.295E−02	2.00E+02
582B	18	2.720E+01	3.953E+07	1.360E−01	2.00E+02
PAA	19	7.670E+00	1.115E+07	3.835E−02	2.00E+02
PAB	20	2.310E+01	3.357E+07	1.155E−01	2.00E+02
PAC	21	8.080E+00	1.566E+08	4.040E−02	2.00E+02
PAD	22	5.440E+00	5.798E+07	2.720E−02	2.00E+02
PAE	23	4.540E+00	7.039E+07	2.270E−02	2.00E+02
PAF	24	1.160E+01	1.686E+07	5.800E−02	2.00E+02
PAG	25	1.220E+01	1.773E+07	6.100E−02	2.00E+02
PAH	26	6.090E+00	8.852E+06	3.045E−02	2.00E+02
PAI	27	6.400E+00	9.302E+06	3.200E−02	2.00E+02
WPAA	28	6.880E+00	1.000E+07	3.440E−02	2.00E+02

Initial Concentration Toxicity Screening Status Requires Modeling 95

Barium

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	1.14E+03	ml/g
Kd Vadose 2	2.00E+01	ml/g
Rd Vadose 1	1.25E+04	
Rd Vadose 2	1.83E+02	
Screening Level	2.60E−01	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	9.630E+01	1.400E+08	8.447E−02	1.14E+03
560B	2	9.940E+01	1.445E+08	8.719E−02	1.14E+03
560C	3	8.620E+01	1.253E+08	7.561E−02	1.14E+03
560D	4	9.910E+01	1.440E+08	8.693E−02	1.14E+03
570A	5	1.050E+02	1.526E+08	9.211E−02	1.14E+03
570B	6	8.340E+01	1.212E+08	7.316E−02	1.14E+03
570C	7	9.900E+01	1.439E+08	8.684E−02	1.14E+03
570D	8	9.900E+01	1.439E+08	8.684E−02	1.14E+03
570E	9	1.090E+02	1.584E+08	9.561E−02	1.14E+03
575A	10	1.080E+02	1.570E+08	9.474E−02	1.14E+03
575B	11	1.090E+02	1.584E+08	9.561E−02	1.14E+03
580A	12	7.660E+01	1.113E+08	6.719E−02	1.14E+03
581A	13	1.030E+02	1.497E+08	9.035E−02	1.14E+03
581B	14	1.370E+02	1.991E+08	1.202E−01	1.14E+03
581C	15	7.010E+01	1.019E+08	6.149E−02	1.14E+03
581D	16	1.250E+02	1.817E+08	1.096E−01	1.14E+03
582A	17	7.480E+01	1.087E+08	6.561E−02	1.14E+03
582B	18	1.090E+02	1.584E+08	9.561E−02	1.14E+03
PAA	19	1.040E+02	1.512E+08	9.123E−02	1.14E+03
PAB	20	5.120E+02	7.442E+08	4.491E−01	1.14E+03
PAC	21	1.640E+02	3.178E+09	1.439E−01	1.14E+03
PAD	22	4.340E+02	4.626E+09	3.807E−01	1.14E+03
PAE	23	7.950E+01	1.233E+09	6.974E−02	1.14E+03
PAF	24	1.450E+02	2.108E+08	1.272E−01	1.14E+03
PAG	25	4.140E+02	6.017E+08	3.632E−01	1.14E+03
PAH	26	8.310E+01	1.208E+08	7.289E−02	1.14E+03
PAI	27	1.830E+02	2.660E+08	1.605E−01	1.14E+03
WPAA	28	6.380E+01	9.273E+07	5.596E−02	1.14E+03

Initial Concentration Toxicity Screening Status Requires Modeling 96

Cyanide

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	4.29E−02	ml/g
Kd Vadose 2	1.85E−02	ml/g
Rd Vadose 1	1.47E+00	
Rd Vadose 2	1.17E+00	
Screening Level	7.30E−02	mg/l
Lambda	9.50E−04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	5.30E−01	7.703E+05	1.235E+01	0.0127008
560B	2	3.12E−01	4.535E+05	7.273E+00	0.012531456
560C	3	1.20E+00	1.744E+06	2.797E+01	0.0127008
560D	4	1.10E−01	1.599E+05	2.564E+00	0.01241856
570A	5	4.50E−01	6.541E+05	1.049E+01	0.012757248
570B	6	1.80E−01	2.616E+05	4.196E+00	0.01298304
570C	7	5.00E−01	7.267E+05	1.166E+01	0.01241856
570D	8	5.00E−01	7.267E+05	1.166E+01	0.01241856
570E	9	4.40E−01	6.395E+05	1.026E+01	0.01298304
575A	10	3.70E−01	5.378E+05	8.625E+00	0.0127008
575B	11	4.40E−01	6.395E+05	1.026E+01	0.01298304
580A	12	2.70E−01	3.924E+05	6.294E+00	0.0127008
581A	13	9.10E−01	1.323E+06	2.121E+01	0.01241856
581B	14	8.80E−01	1.279E+06	2.051E+01	0.01241856
581C	15	2.70E−01	3.924E+05	6.294E+00	0.012079872
581D	16	6.50E−01	9.447E+05	1.515E+01	0.01241856
582A	17	4.30E−01	6.250E+05	1.002E+01	0.012079872
582B	18	3.00E−01	4.360E+05	6.993E+00	0.01241856
PAA	19	1.50E+00	2.180E+06	3.497E+01	0.01241856
PAB	20	6.30E−01	9.157E+05	1.469E+01	0.01241856
PAC	21	1.50E−01	2.907E+06	3.497E+00	0.01241856
PAD	22	8.60E+00	9.166E+07	2.005E+02	0.01241856
PAE	23	1.30E+00	2.015E+07	3.030E+01	0.01241856
PAF	24	2.70E−01	3.924E+05	6.294E+00	0.01241856
PAG	25	5.20E−01	7.558E+05	1.212E+01	0.01241856
PAH	26	6.90E−01	1.003E+06	1.608E+01	0.01241856
PAI	27	2.70E−01	3.924E+05	6.294E+00	0.01241856
WPAA	28	3.70E−01	5.378E+05	8.625E+00	0.01241856

Initial Concentration Toxicity Screening Status Requires Modeling 103

Magnesium

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	4.50E+00	ml/g
Kd Vadose 2	4.50E+00	ml/g
Rd Vadose 1	5.03E+01	
Rd Vadose 2	4.19E+01	
Screening Level	3.50E+01	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	2.81E+04	4.084E+10	6.244E+03	4.5
560B	2	4.86E+04	7.064E+10	1.080E+04	4.5
560C	3	2.99E+04	4.341E+10	6.637E+03	4.5
560D	4	2.52E+03	3.663E+09	5.600E+02	4.5
570A	5	2.32E+04	3.371E+10	5.154E+03	4.5
570B	6	2.24E+04	3.257E+10	4.980E+03	4.5
570C	7	2.23E+04	3.239E+10	4.951E+03	4.5
570D	8	2.23E+04	3.239E+10	4.951E+03	4.5
570E	9	2.05E+03	2.980E+09	4.556E+02	4.5
575A	10	2.98E+04	4.331E+10	6.622E+03	4.5
575B	11	2.05E+03	2.980E+09	4.556E+02	4.5
580A	12	8.85E+03	1.286E+10	1.967E+03	4.5
581A	13	3.54E+04	5.145E+10	7.867E+03	4.5
581B	14	3.40E+04	4.940E+10	7.553E+03	4.5
581C	15	1.20E+03	1.744E+09	2.667E+02	4.5
581D	16	1.76E+03	2.558E+09	3.911E+02	4.5
582A	17	1.77E+04	2.573E+10	3.933E+03	4.5
582B	18	1.66E+04	2.413E+10	3.689E+03	4.5
PAA	19	3.95E+04	5.741E+10	8.778E+03	4.5
PAB	20	2.45E+04	3.566E+10	5.452E+03	4.5
PAC	21	2.53E+04	4.903E+11	5.622E+03	4.5
PAD	22	3.65E+04	3.890E+11	8.111E+03	4.5
PAE	23	2.39E+04	3.705E+11	5.311E+03	4.5
PAF	24	4.46E+04	6.482E+10	9.911E+03	4.5
PAG	25	2.78E+04	4.046E+10	6.187E+03	4.5
PAH	26	2.65E+04	3.858E+10	5.898E+03	4.5
PAI	27	2.28E+04	3.314E+10	5.067E+03	4.5
WPAA	28	2.24E+04	3.256E+10	4.979E+03	4.5

Initial Concentration Toxicity Screening Status Requires Modeling 106

Manganese

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	1.80E+02	ml/g
Kd Vadose 2	5.00E+01	ml/g
Rd Vadose 1	1.97E+03	
Rd Vadose 2	4.56E+02	
Screening Level	1.80E−02	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	8.630E+02	1.254E+09	4.794E+00	1.80E+02
560B	2	8.300E+02	1.206E+09	4.611E+00	1.80E+02
560C	3	4.750E+02	6.904E+08	2.639E+00	1.80E+02
560D	4	7.890E+02	1.147E+09	4.383E+00	1.80E+02
570A	5	7.940E+02	1.154E+09	4.411E+00	1.80E+02
570B	6	5.600E+02	8.139E+08	3.111E+00	1.80E+02
570C	7	7.590E+02	1.103E+09	4.217E+00	1.80E+02
570D	8	7.590E+02	1.103E+09	4.217E+00	1.80E+02
570E	9	5.600E+02	8.139E+08	3.111E+00	1.80E+02
575A	10	1.350E+03	1.962E+09	7.500E+00	1.80E+02
575B	11	1.170E+03	1.701E+09	6.500E+00	1.80E+02
580A	12	4.430E+02	6.439E+08	2.461E+00	1.80E+02
581A	13	3.420E+03	4.971E+09	1.900E+01	1.80E+02
581B	14	1.740E+03	2.529E+09	9.667E+00	1.80E+02
581C	15	9.020E+02	1.311E+09	5.011E+00	1.80E+02
581D	16	2.040E+03	2.965E+09	1.133E+01	1.80E+02
582A	17	6.190E+02	8.997E+08	3.439E+00	1.80E+02
582B	18	4.630E+02	6.729E+08	2.572E+00	1.80E+02
PAA	19	7.060E+02	1.026E+09	3.922E+00	1.80E+02
PAB	20	9.080E+02	1.320E+09	5.044E+00	1.80E+02
PAC	21	1.160E+03	2.248E+10	6.444E+00	1.80E+02
PAD	22	6.970E+02	7.429E+09	3.872E+00	1.80E+02
PAE	23	5.260E+02	8.155E+09	2.922E+00	1.80E+02
PAF	24	6.920E+02	1.006E+09	3.844E+00	1.80E+02
PAG	25	8.970E+02	1.304E+09	4.983E+00	1.80E+02
PAH	26	1.070E+03	1.555E+09	5.944E+00	1.80E+02
PAI	27	1.720E+03	2.500E+09	9.556E+00	1.80E+02
WPAA	28	8.410E+02	1.222E+09	4.672E+00	1.80E+02

Initial Concentration Toxicity Screening Status Requires Modeling 107

Mercury

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	1.00E+01	ml/g
Kd Vadose 2	1.00E+01	ml/g
Rd Vadose 1	1.11E+02	
Rd Vadose 2	9.19E+01	
Screening Level	1.10E−03	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	3.00E−01	4.360E+05	3.000E−02	10
560B	2	3.00E−01	4.360E+05	3.000E−02	10
560C	3	3.00E−01	4.360E+05	3.000E−02	10
560D	4	3.00E−01	4.360E+05	3.000E−02	10
570A	5	3.00E−01	4.360E+05	3.000E−02	10
570B	6	3.00E−01	4.360E+05	3.000E−02	10
570C	7	8.00E−02	1.163E+05	8.000E−03	10
570D	8	8.00E−02	1.163E+05	8.000E−03	10
570E	9	3.00E−01	4.360E+05	3.000E−02	10
575A	10	3.00E−01	4.360E+05	3.000E−02	10
575B	11	3.00E−01	4.360E+05	3.000E−02	10
580A	12	3.00E−01	4.360E+05	3.000E−02	10
581A	13	5.70E−01	8.285E+05	5.700E−02	10
581B	14	1.20E−01	1.744E+05	1.200E−02	10
581C	15	3.00E−01	4.360E+05	3.000E−02	10
581D	16	3.00E−01	4.360E+05	3.000E−02	10
582A	17	3.00E−01	4.360E+05	3.000E−02	10
582B	18	3.00E−01	4.360E+05	3.000E−02	10
PAA	19	2.00E−01	2.907E+05	2.000E−02	10
PAB	20	3.20E−01	4.651E+05	3.200E−02	10
PAC	21	1.30E+00	2.519E+07	1.300E−01	10
PAD	22	6.50E−01	6.928E+06	6.500E−02	10
PAE	23	7.00E−02	1.085E+06	7.000E−03	10
PAF	24	3.00E−01	4.360E+05	3.000E−02	10
PAG	25	1.10E+00	1.599E+06	1.100E−01	10
PAH	26	5.30E−01	7.703E+05	5.300E−02	10
PAI	27	3.00E−01	4.360E+05	3.000E−02	10
WPAA	28	2.00E−02	2.907E+04	2.000E−03	10

Initial Concentration Toxicity Screening Status Requires Modeling 108

Molybdenum

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	9.00E+01	ml/g
Kd Vadose 2	1.00E+01	ml/g
Rd Vadose 1	9.87E+02	
Rd Vadose 2	9.19E+01	
Screening Level	1.80E−02	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.240E+01	1.802E+07	1.378E−01	9.00E+01
560B	2	1.110E+01	1.613E+07	1.233E−01	9.00E+01
560C	3	4.600E+00	6.686E+06	5.111E−02	9.00E+01
560D	4	5.300E+00	7.703E+06	5.889E−02	9.00E+01
570A	5	5.200E+00	7.558E+06	5.778E−02	9.00E+01
570B	6	4.170E+00	6.061E+06	4.633E−02	9.00E+01
570C	7	5.000E+00	7.267E+06	5.556E−02	9.00E+01
570D	8	5.000E+00	7.267E+06	5.556E−02	9.00E+01
570E	9	2.700E+00	3.924E+06	3.000E−02	9.00E+01
575A	10	2.700E+00	3.924E+06	3.000E−02	9.00E+01
575B	11	2.700E+00	3.924E+06	3.000E−02	9.00E+01
580A	12	2.700E+00	3.924E+06	3.000E−02	9.00E+01
581A	13	8.300E−01	1.206E+06	9.222E−03	9.00E+01
581B	14	7.900E+00	1.148E+07	8.778E−02	9.00E+01
581C	15	7.900E+00	1.148E+07	8.778E−02	9.00E+01
581D	16	8.500E+00	1.235E+07	9.444E−02	9.00E+01
582A	17	6.500E+00	9.447E+06	7.222E−02	9.00E+01
582B	18	2.300E+00	3.343E+06	2.556E−02	9.00E+01
PAA	19	3.560E+00	5.174E+06	3.956E−02	9.00E+01
PAB	20	1.240E+01	1.802E+07	1.378E−01	9.00E+01
PAC	21	3.440E+00	6.666E+07	3.822E−02	9.00E+01
PAD	22	1.280E+01	1.364E+08	1.422E−01	9.00E+01
PAE	23	4.600E+00	7.132E+07	5.111E−02	9.00E+01
PAF	24	2.700E+00	3.924E+06	3.000E−02	9.00E+01
PAG	25	4.700E+00	6.831E+06	5.222E−02	9.00E+01
PAH	26	4.070E+00	5.916E+06	4.522E−02	9.00E+01
PAI	27	2.700E+00	3.924E+06	3.000E−02	9.00E+01
WPAA	28	3.550E+00	5.160E+06	3.944E−02	9.00E+01

Initial Concentration Toxicity Screening Status Requires Modeling 109

Thallium

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	1.50E+03	ml/g
Kd Vadose 2	1.50E+03	ml/g
Rd Vadose 1	1.64E+04	
Rd Vadose 2	1.36E+04	
Screening Level	2.60E−04	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	6.700E−01	9.738E+05	4.467E−04	1.50E+03
560B	2	5.800E−01	8.430E+05	3.867E−04	1.50E+03
560C	3	5.800E−01	8.430E+05	3.867E−04	1.50E+03
560D	4	5.800E−01	8.430E+05	3.867E−04	1.50E+03
570A	5	2.200E−01	3.198E+05	1.467E−04	1.50E+03
570B	6	5.800E−01	8.430E+05	3.867E−04	1.50E+03
570C	7	4.900E−01	7.122E+05	3.267E−04	1.50E+03
570D	8	4.900E−01	7.122E+05	3.267E−04	1.50E+03
570E	9	5.800E−01	8.430E+05	3.867E−04	1.50E+03
575A	10	5.800E−01	8.430E+05	3.867E−04	1.50E+03
575B	11	5.800E−01	8.430E+05	3.867E−04	1.50E+03
580A	12	5.800E−01	8.430E+05	3.867E−04	1.50E+03
581A	13	7.500E−01	1.090E+06	5.000E−04	1.50E+03
581B	14	4.700E−01	6.831E+05	3.133E−04	1.50E+03
581C	15	5.800E−01	8.430E+05	3.867E−04	1.50E+03
581D	16	5.800E−01	8.430E+05	3.867E−04	1.50E+03
582A	17	3.200E−01	4.651E+05	2.133E−04	1.50E+03
582B	18	7.700E−01	1.119E+06	5.133E−04	1.50E+03
PAA	19	2.850E−01	4.142E+05	1.900E−04	1.50E+03
PAB	20	4.200E−01	6.104E+05	2.800E−04	1.50E+03
PAC	21	3.800E−01	7.364E+06	2.533E−04	1.50E+03
PAD	22	3.900E−01	4.157E+06	2.600E−04	1.50E+03
PAE	23	2.700E−01	4.186E+06	1.800E−04	1.50E+03
PAF	24	3.700E−01	5.378E+05	2.467E−04	1.50E+03
PAG	25	4.400E−01	6.395E+05	2.933E−04	1.50E+03
PAH	26	5.000E−01	7.267E+05	3.333E−04	1.50E+03
PAI	27	3.000E−01	4.360E+05	2.000E−04	1.50E+03
WPAA	28	2.700E−01	3.924E+05	1.800E−04	1.50E+03

Initial Concentration Toxicity Screening Status Requires Modeling 115

Boron

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	3.00E+00	ml/g
Kd Vadose 2	3.00E+00	ml/g
Rd Vadose 1	3.39E+01	
Rd Vadose 2	2.83E+01	
Screening Level	3.30E−01	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.43E+01	2.078E+07	4.767E+00	3.00E+00
560B	2	1.37E+01	1.991E+07	4.567E+00	3.00E+00
560C	3	1.37E+01	1.991E+07	4.567E+00	3.00E+00
560D	4	1.37E+01	1.991E+07	4.567E+00	3.00E+00
570A	5	1.37E+01	1.991E+07	4.567E+00	3.00E+00
570B	6	1.37E+01	1.991E+07	4.567E+00	3.00E+00
570C	7	1.37E+01	1.991E+07	4.567E+00	3.00E+00
570D	8	1.37E+01	1.991E+07	4.567E+00	3.00E+00
570E	9	1.37E+01	1.991E+07	4.567E+00	3.00E+00
575A	10	1.37E+01	1.991E+07	4.567E+00	3.00E+00
575B	11	1.37E+01	1.991E+07	4.567E+00	3.00E+00
580A	12	1.37E+01	1.991E+07	4.567E+00	3.00E+00
581A	13	1.43E+01	2.078E+07	4.767E+00	3.00E+00
581B	14	1.37E+01	1.991E+07	4.567E+00	3.00E+00
581C	15	1.37E+01	1.991E+07	4.567E+00	3.00E+00
581D	16	1.37E+01	1.991E+07	4.567E+00	3.00E+00
582A	17	1.43E+01	2.078E+07	4.767E+00	3.00E+00
582B	18	1.37E+01	1.991E+07	4.567E+00	3.00E+00
PAA	19	1.37E+01	1.991E+07	4.567E+00	3.00E+00
PAB	20	1.37E+01	1.991E+07	4.567E+00	3.00E+00
PAC	21	1.37E+01	2.655E+08	4.567E+00	3.00E+00
PAD	22	1.37E+01	1.460E+08	4.567E+00	3.00E+00
PAE	23	1.37E+01	2.124E+08	4.567E+00	3.00E+00
PAF	24	1.37E+01	1.991E+07	4.567E+00	3.00E+00
PAG	25	1.37E+01	1.991E+07	4.567E+00	3.00E+00
PAH	26	1.37E+01	1.991E+07	4.567E+00	3.00E+00
PAI	27	1.37E+01	1.991E+07	4.567E+00	3.00E+00
WPAA	28	1.37E+01	1.991E+07	4.567E+00	3.00E+00

Initial Concentration Toxicity Screening Status Requires Modeling 119

1,2-dichloroethane

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	1.56E-01	ml/g
Kd Vadose 2	2.95E-02	ml/g
Rd Vadose 1	2.71E+00	
Rd Vadose 2	1.27E+00	
Screening Level	2.00E-05	mg/l
Lambda	9.50E-04	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.1597806
560B	2	0.00E+00	0.000E+00	0.000E+00	0.157650192
560C	3	0.00E+00	0.000E+00	0.000E+00	0.1597806
560D	4	0.00E+00	0.000E+00	0.000E+00	0.15622992
570A	5	0.00E+00	0.000E+00	0.000E+00	0.160490736
570B	6	0.00E+00	0.000E+00	0.000E+00	0.16333128
570C	7	0.00E+00	0.000E+00	0.000E+00	0.15622992
570D	8	0.00E+00	0.000E+00	0.000E+00	0.15622992
570E	9	0.00E+00	0.000E+00	0.000E+00	0.16333128
575A	10	0.00E+00	0.000E+00	0.000E+00	0.1597806
575B	11	0.00E+00	0.000E+00	0.000E+00	0.16333128
580A	12	0.00E+00	0.000E+00	0.000E+00	0.1597806
581A	13	0.00E+00	0.000E+00	0.000E+00	0.15622992
581B	14	0.00E+00	0.000E+00	0.000E+00	0.15622992
581C	15	0.00E+00	0.000E+00	0.000E+00	0.151969104
581D	16	0.00E+00	0.000E+00	0.000E+00	0.15622992
582A	17	0.00E+00	0.000E+00	0.000E+00	0.151969104
582B	18	0.00E+00	0.000E+00	0.000E+00	0.15622992
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.15622992
PAB	20	2.00E-03	2.907E+03	1.279E-02	0.15622992
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.15622992
PAD	22	2.00E-03	2.132E+04	1.279E-02	0.15622992
PAE	23	6.00E-03	9.302E+04	3.838E-02	0.15622992
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.15622992
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.15622992
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.15622992
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.15622992
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.15622992

Initial Concentration Toxicity Screening Status Requires Modeling 120

2,4-dinitrotoluene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	5.27E-01	ml/g
Kd Vadose 2	9.94E-02	ml/g
Rd Vadose 1	6.77E+00	
Rd Vadose 2	1.90E+00	
Screening Level	1.30E-05	mg/l
Lambda	1.90E-03	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.53865
560B	2	0.00E+00	0.000E+00	0.000E+00	0.531468
560C	3	0.00E+00	0.000E+00	0.000E+00	0.53865
560D	4	0.00E+00	0.000E+00	0.000E+00	0.52668
570A	5	0.00E+00	0.000E+00	0.000E+00	0.541044
570B	6	0.00E+00	0.000E+00	0.000E+00	0.55062
570C	7	0.00E+00	0.000E+00	0.000E+00	0.52668
570D	8	0.00E+00	0.000E+00	0.000E+00	0.52668
570E	9	0.00E+00	0.000E+00	0.000E+00	0.55062
575A	10	0.00E+00	0.000E+00	0.000E+00	0.53865
575B	11	0.00E+00	0.000E+00	0.000E+00	0.55062
580A	12	0.00E+00	0.000E+00	0.000E+00	0.53865
581A	13	0.00E+00	0.000E+00	0.000E+00	0.52668
581B	14	0.00E+00	0.000E+00	0.000E+00	0.52668
581C	15	0.00E+00	0.000E+00	0.000E+00	0.512316
581D	16	0.00E+00	0.000E+00	0.000E+00	0.52668
582A	17	0.00E+00	0.000E+00	0.000E+00	0.512316
582B	18	0.00E+00	0.000E+00	0.000E+00	0.52668
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.52668
PAB	20	5.30E-02	7.703E+04	1.006E-01	0.52668
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.52668
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.52668
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.52668
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.52668
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.52668
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.52668
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.52668
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.52668

Initial Concentration Toxicity Screening Status Requires Modeling 122

2,6-dinitrotoluene

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	1.05E+00	ml/g
Kd Vadose 2	1.99E-01	ml/g
Rd Vadose 1	1.25E+01	
Rd Vadose 2	2.81E+00	
Screening Level	1.30E-05	mg/l
Lambda	1.90E-03	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	1.0773
560B	2	0.00E+00	0.000E+00	0.000E+00	1.062936
560C	3	0.00E+00	0.000E+00	0.000E+00	1.0773
560D	4	0.00E+00	0.000E+00	0.000E+00	1.05336
570A	5	0.00E+00	0.000E+00	0.000E+00	1.082088
570B	6	0.00E+00	0.000E+00	0.000E+00	1.10124
570C	7	0.00E+00	0.000E+00	0.000E+00	1.05336
570D	8	0.00E+00	0.000E+00	0.000E+00	1.05336
570E	9	0.00E+00	0.000E+00	0.000E+00	1.10124
575A	10	0.00E+00	0.000E+00	0.000E+00	1.0773
575B	11	0.00E+00	0.000E+00	0.000E+00	1.10124
580A	12	0.00E+00	0.000E+00	0.000E+00	1.0773
581A	13	0.00E+00	0.000E+00	0.000E+00	1.05336
581B	14	0.00E+00	0.000E+00	0.000E+00	1.05336
581C	15	0.00E+00	0.000E+00	0.000E+00	1.024632
581D	16	0.00E+00	0.000E+00	0.000E+00	1.05336
582A	17	0.00E+00	0.000E+00	0.000E+00	1.024632
582B	18	0.00E+00	0.000E+00	0.000E+00	1.05336
PAA	19	0.00E+00	0.000E+00	0.000E+00	1.05336
PAB	20	0.00E+00	0.000E+00	0.000E+00	1.05336
PAC	21	0.00E+00	0.000E+00	0.000E+00	1.05336
PAD	22	1.10E-02	1.172E+05	1.044E-02	1.05336
PAE	23	0.00E+00	0.000E+00	0.000E+00	1.05336
PAF	24	0.00E+00	0.000E+00	0.000E+00	1.05336
PAG	25	0.00E+00	0.000E+00	0.000E+00	1.05336
PAH	26	0.00E+00	0.000E+00	0.000E+00	1.05336
PAI	27	0.00E+00	0.000E+00	0.000E+00	1.05336
WPAA	28	0.00E+00	0.000E+00	0.000E+00	1.05336

Initial Concentration Toxicity Screening Status Requires Modeling 123

2-chlorophenol

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	7.82E-01	ml/g
Kd Vadose 2	1.47E-01	ml/g
Rd Vadose 1	9.56E+00	
Rd Vadose 2	2.34E+00	
Screening Level	1.80E-02	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.79947
560B	2	4.80E-02	6.977E+04	6.140E-02	0.7888104
560C	3	0.00E+00	0.000E+00	0.000E+00	0.79947
560D	4	0.00E+00	0.000E+00	0.000E+00	0.781704
570A	5	0.00E+00	0.000E+00	0.000E+00	0.8030232
570B	6	0.00E+00	0.000E+00	0.000E+00	0.817236
570C	7	0.00E+00	0.000E+00	0.000E+00	0.781704
570D	8	0.00E+00	0.000E+00	0.000E+00	0.781704
570E	9	0.00E+00	0.000E+00	0.000E+00	0.817236
575A	10	0.00E+00	0.000E+00	0.000E+00	0.79947
575B	11	0.00E+00	0.000E+00	0.000E+00	0.817236
580A	12	0.00E+00	0.000E+00	0.000E+00	0.79947
581A	13	0.00E+00	0.000E+00	0.000E+00	0.781704
581B	14	0.00E+00	0.000E+00	0.000E+00	0.781704
581C	15	0.00E+00	0.000E+00	0.000E+00	0.7603848
581D	16	0.00E+00	0.000E+00	0.000E+00	0.781704
582A	17	0.00E+00	0.000E+00	0.000E+00	0.7603848
582B	18	0.00E+00	0.000E+00	0.000E+00	0.781704
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.781704
PAB	20	0.00E+00	0.000E+00	0.000E+00	0.781704
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.781704
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.781704
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.781704
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.781704
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.781704
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.781704
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.781704
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.781704

Initial Concentration Toxicity Screening Status Requires Modeling 124

2-methylphenol

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	4.94E-01	ml/g
Kd Vadose 2	9.32E-02	ml/g
Rd Vadose 1	6.41E+00	
Rd Vadose 2	1.85E+00	
Screening Level	1.83E-01	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.505197
560B	2	0.00E+00	0.000E+00	0.000E+00	0.49846104
560C	3	0.00E+00	0.000E+00	0.000E+00	0.505197
560D	4	0.00E+00	0.000E+00	0.000E+00	0.4939704
570A	5	0.00E+00	0.000E+00	0.000E+00	0.50744232
570B	6	0.00E+00	0.000E+00	0.000E+00	0.5164236
570C	7	0.00E+00	0.000E+00	0.000E+00	0.4939704
570D	8	0.00E+00	0.000E+00	0.000E+00	0.4939704
570E	9	0.00E+00	0.000E+00	0.000E+00	0.5164236
575A	10	0.00E+00	0.000E+00	0.000E+00	0.505197
575B	11	0.00E+00	0.000E+00	0.000E+00	0.5164236
580A	12	0.00E+00	0.000E+00	0.000E+00	0.505197
581A	13	0.00E+00	0.000E+00	0.000E+00	0.4939704
581B	14	0.00E+00	0.000E+00	0.000E+00	0.4939704
581C	15	0.00E+00	0.000E+00	0.000E+00	0.48049848
581D	16	0.00E+00	0.000E+00	0.000E+00	0.4939704
582A	17	0.00E+00	0.000E+00	0.000E+00	0.48049848
582B	18	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAB	20	4.50E-02	6.541E+04	9.110E-02	0.4939704
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.4939704
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.4939704
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.4939704

Initial Concentration Toxicity Screening Status

4-chloro-3-methylphenol

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	6.99E+00	ml/g
Kd Vadose 2	1.32E+00	ml/g
Rd Vadose 1	7.75E+01	
Rd Vadose 2	1.30E+01	
Screening Level	1.83E-01	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	7.13853
560B	2	4.60E-02	6.686E+04	6.585E-03	7.0433496
560C	3	0.00E+00	0.000E+00	0.000E+00	7.13853
560D	4	0.00E+00	0.000E+00	0.000E+00	6.979896
570A	5	0.00E+00	0.000E+00	0.000E+00	7.1702568
570B	6	0.00E+00	0.000E+00	0.000E+00	7.297164
570C	7	0.00E+00	0.000E+00	0.000E+00	6.979896
570D	8	0.00E+00	0.000E+00	0.000E+00	6.979896
570E	9	0.00E+00	0.000E+00	0.000E+00	7.297164
575A	10	0.00E+00	0.000E+00	0.000E+00	7.13853
575B	11	0.00E+00	0.000E+00	0.000E+00	7.297164
580A	12	0.00E+00	0.000E+00	0.000E+00	7.13853
581A	13	0.00E+00	0.000E+00	0.000E+00	6.979896
581B	14	0.00E+00	0.000E+00	0.000E+00	6.979896
581C	15	0.00E+00	0.000E+00	0.000E+00	6.7895352
581D	16	0.00E+00	0.000E+00	0.000E+00	6.979896
582A	17	0.00E+00	0.000E+00	0.000E+00	6.7895352
582B	18	0.00E+00	0.000E+00	0.000E+00	6.979896
PAA	19	0.00E+00	0.000E+00	0.000E+00	6.979896
PAB	20	0.00E+00	0.000E+00	0.000E+00	6.979896
PAC	21	0.00E+00	0.000E+00	0.000E+00	6.979896
PAD	22	0.00E+00	0.000E+00	0.000E+00	6.979896
PAE	23	8.80E-02	1.364E+06	1.260E-02	6.979896
PAF	24	0.00E+00	0.000E+00	0.000E+00	6.979896
PAG	25	0.00E+00	0.000E+00	0.000E+00	6.979896
PAH	26	0.00E+00	0.000E+00	0.000E+00	6.979896
PAI	27	0.00E+00	0.000E+00	0.000E+00	6.979896
WPAA	28	0.00E+00	0.000E+00	0.000E+00	6.979896

Initial Concentration Toxicity Screening Status

4-methylphenol

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	4.40E-01	ml/g
Kd Vadose 2	8.30E-02	ml/g
Rd Vadose 1	5.82E+00	
Rd Vadose 2	1.76E+00	
Screening Level	1.83E-01	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.450198
560B	2	0.00E+00	0.000E+00	0.000E+00	0.44419536
560C	3	6.10E-02	8.866E+04	1.386E-01	0.450198
560D	4	0.00E+00	0.000E+00	0.000E+00	0.4401936
570A	5	0.00E+00	0.000E+00	0.000E+00	0.45219888
570B	6	0.00E+00	0.000E+00	0.000E+00	0.4602024
570C	7	0.00E+00	0.000E+00	0.000E+00	0.4401936
570D	8	0.00E+00	0.000E+00	0.000E+00	0.4401936
570E	9	0.00E+00	0.000E+00	0.000E+00	0.4602024
575A	10	1.90E-01	2.762E+05	4.316E-01	0.450198
575B	11	0.00E+00	0.000E+00	0.000E+00	0.4602024
580A	12	0.00E+00	0.000E+00	0.000E+00	0.450198
581A	13	0.00E+00	0.000E+00	0.000E+00	0.4401936
581B	14	0.00E+00	0.000E+00	0.000E+00	0.4401936
581C	15	0.00E+00	0.000E+00	0.000E+00	0.42818832
581D	16	0.00E+00	0.000E+00	0.000E+00	0.4401936
582A	17	1.70E+00	2.471E+06	3.862E+00	0.42818832
582B	18	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAB	20	5.00E-02	7.267E+04	1.136E-01	0.4401936
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.4401936
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.4401936
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.4401936

Initial Concentration Toxicity Screening Status Requires Modeling 128

4-nitroaniline

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	1.36E-01	ml/g
Kd Vadose 2	2.56E-02	ml/g
Rd Vadose 1	2.49E+00	
Rd Vadose 2	1.23E+00	
Screening Level	1.10E-02	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.138915
560B	2	3.30E-01	4.796E+05	2.430E+00	0.1370628
560C	3	0.00E+00	0.000E+00	0.000E+00	0.138915
560D	4	0.00E+00	0.000E+00	0.000E+00	0.135828
570A	5	0.00E+00	0.000E+00	0.000E+00	0.1395324
570B	6	0.00E+00	0.000E+00	0.000E+00	0.142002
570C	7	0.00E+00	0.000E+00	0.000E+00	0.135828
570D	8	0.00E+00	0.000E+00	0.000E+00	0.135828
570E	9	0.00E+00	0.000E+00	0.000E+00	0.142002
575A	10	0.00E+00	0.000E+00	0.000E+00	0.138915
575B	11	0.00E+00	0.000E+00	0.000E+00	0.142002
580A	12	0.00E+00	0.000E+00	0.000E+00	0.138915
581A	13	0.00E+00	0.000E+00	0.000E+00	0.135828
581B	14	0.00E+00	0.000E+00	0.000E+00	0.135828
581C	15	0.00E+00	0.000E+00	0.000E+00	0.1321236
581D	16	0.00E+00	0.000E+00	0.000E+00	0.135828
582A	17	0.00E+00	0.000E+00	0.000E+00	0.1321236
582B	18	0.00E+00	0.000E+00	0.000E+00	0.135828
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.135828
PAB	20	0.00E+00	0.000E+00	0.000E+00	0.135828
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.135828
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.135828
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.135828
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.135828
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.135828
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.135828
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.135828
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.135828

Initial Concentration Toxicity Screening Status Requires Modeling 129

Benzyl alcohol

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	6.99E−02	ml/g
Kd Vadose 2	1.32E−02	ml/g
Rd Vadose 1	1.76E+00	
Rd Vadose 2	1.12E+00	
Screening Level	1.10E+00	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.0713853
560B	2	6.90E−02	1.003E+05	9.878E−01	0.070433496
560C	3	0.00E+00	0.000E+00	0.000E+00	0.0713853
560D	4	0.00E+00	0.000E+00	0.000E+00	0.06979896
570A	5	0.00E+00	0.000E+00	0.000E+00	0.071702568
570B	6	0.00E+00	0.000E+00	0.000E+00	0.07297164
570C	7	0.00E+00	0.000E+00	0.000E+00	0.06979896
570D	8	0.00E+00	0.000E+00	0.000E+00	0.06979896
570E	9	0.00E+00	0.000E+00	0.000E+00	0.07297164
575A	10	0.00E+00	0.000E+00	0.000E+00	0.0713853
575B	11	0.00E+00	0.000E+00	0.000E+00	0.07297164
580A	12	0.00E+00	0.000E+00	0.000E+00	0.0713853
581A	13	0.00E+00	0.000E+00	0.000E+00	0.06979896
581B	14	0.00E+00	0.000E+00	0.000E+00	0.06979896
581C	15	0.00E+00	0.000E+00	0.000E+00	0.067895352
581D	16	0.00E+00	0.000E+00	0.000E+00	0.06979896
582A	17	0.00E+00	0.000E+00	0.000E+00	0.067895352
582B	18	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAB	20	2.90E−01	4.215E+05	4.151E+00	0.06979896
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.06979896
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.06979896
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.06979896

Initial Concentration Toxicity Screening Status Requires Modeling 130

Bis(2-chloroisopropyl)ethe

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	6.99E-01	ml/g
Kd Vadose 2	1.32E-01	ml/g
Rd Vadose 1	8.65E+00	
Rd Vadose 2	2.20E+00	
Screening Level	4.20E-05	mg/l
Lambda	1.00E-50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.71442
560B	2	0.00E+00	0.000E+00	0.000E+00	0.7048944
560C	3	0.00E+00	0.000E+00	0.000E+00	0.71442
560D	4	0.00E+00	0.000E+00	0.000E+00	0.698544
570A	5	4.40E-02	6.395E+04	6.299E-02	0.7175952
570B	6	0.00E+00	0.000E+00	0.000E+00	0.730296
570C	7	0.00E+00	0.000E+00	0.000E+00	0.698544
570D	8	0.00E+00	0.000E+00	0.000E+00	0.698544
570E	9	0.00E+00	0.000E+00	0.000E+00	0.730296
575A	10	0.00E+00	0.000E+00	0.000E+00	0.71442
575B	11	0.00E+00	0.000E+00	0.000E+00	0.730296
580A	12	0.00E+00	0.000E+00	0.000E+00	0.71442
581A	13	0.00E+00	0.000E+00	0.000E+00	0.698544
581B	14	0.00E+00	0.000E+00	0.000E+00	0.698544
581C	15	0.00E+00	0.000E+00	0.000E+00	0.6794928
581D	16	0.00E+00	0.000E+00	0.000E+00	0.698544
582A	17	0.00E+00	0.000E+00	0.000E+00	0.6794928
582B	18	0.00E+00	0.000E+00	0.000E+00	0.698544
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.698544
PAB	20	4.80E-02	6.977E+04	6.871E-02	0.698544
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.698544
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.698544
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.698544
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.698544
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.698544
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.698544
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.698544
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.698544

Initial Concentration Toxicity Screening Status Requires Modeling 131

Bromodichloromethane

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	4.21E−01	ml/g
Kd Vadose 2	7.94E−02	ml/g
Rd Vadose 1	5.61E+00	
Rd Vadose 2	1.72E+00	
Screening Level	1.40E−04	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.430353
560B	2	0.00E+00	0.000E+00	0.000E+00	0.42461496
560C	3	0.00E+00	0.000E+00	0.000E+00	0.430353
560D	4	0.00E+00	0.000E+00	0.000E+00	0.4207896
570A	5	0.00E+00	0.000E+00	0.000E+00	0.43226568
570B	6	0.00E+00	0.000E+00	0.000E+00	0.4399164
570C	7	0.00E+00	0.000E+00	0.000E+00	0.4207896
570D	8	0.00E+00	0.000E+00	0.000E+00	0.4207896
570E	9	0.00E+00	0.000E+00	0.000E+00	0.4399164
575A	10	6.00E−03	8.721E+03	1.426E−02	0.430353
575B	11	0.00E+00	0.000E+00	0.000E+00	0.4399164
580A	12	0.00E+00	0.000E+00	0.000E+00	0.430353
581A	13	0.00E+00	0.000E+00	0.000E+00	0.4207896
581B	14	0.00E+00	0.000E+00	0.000E+00	0.4207896
581C	15	0.00E+00	0.000E+00	0.000E+00	0.40931352
581D	16	0.00E+00	0.000E+00	0.000E+00	0.4207896
582A	17	0.00E+00	0.000E+00	0.000E+00	0.40931352
582B	18	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAB	20	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAE	23	7.00E−03	1.085E+05	1.664E−02	0.4207896
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.4207896
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.4207896
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.4207896

Initial Concentration Toxicity Screening Status Requires Modeling 132

Endosulfan II

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	2.31E+01	ml/g
Kd Vadose 2	4.36E+00	ml/g
Rd Vadose 1	2.54E+02	
Rd Vadose 2	4.07E+01	
Screening Level	2.19E−02	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	23.63823
560B	2	0.00E+00	0.000E+00	0.000E+00	23.3230536
560C	3	0.00E+00	0.000E+00	0.000E+00	23.63823
560D	4	0.00E+00	0.000E+00	0.000E+00	23.112936
570A	5	0.00E+00	0.000E+00	0.000E+00	23.7432888
570B	6	0.00E+00	0.000E+00	0.000E+00	24.163524
570C	7	0.00E+00	0.000E+00	0.000E+00	23.112936
570D	8	0.00E+00	0.000E+00	0.000E+00	23.112936
570E	9	0.00E+00	0.000E+00	0.000E+00	24.163524
575A	10	0.00E+00	0.000E+00	0.000E+00	23.63823
575B	11	0.00E+00	0.000E+00	0.000E+00	24.163524
580A	12	0.00E+00	0.000E+00	0.000E+00	23.63823
581A	13	0.00E+00	0.000E+00	0.000E+00	23.112936
581B	14	0.00E+00	0.000E+00	0.000E+00	23.112936
581C	15	0.00E+00	0.000E+00	0.000E+00	22.4825832
581D	16	0.00E+00	0.000E+00	0.000E+00	23.112936
582A	17	0.00E+00	0.000E+00	0.000E+00	22.4825832
582B	18	0.00E+00	0.000E+00	0.000E+00	23.112936
PAA	19	2.00E−03	2.907E+03	8.651E−05	23.112936
PAB	20	0.00E+00	0.000E+00	0.000E+00	23.112936
PAC	21	0.00E+00	0.000E+00	0.000E+00	23.112936
PAD	22	0.00E+00	0.000E+00	0.000E+00	23.112936
PAE	23	0.00E+00	0.000E+00	0.000E+00	23.112936
PAF	24	0.00E+00	0.000E+00	0.000E+00	23.112936
PAG	25	0.00E+00	0.000E+00	0.000E+00	23.112936
PAH	26	0.00E+00	0.000E+00	0.000E+00	23.112936
PAI	27	0.00E+00	0.000E+00	0.000E+00	23.112936
WPAA	28	0.00E+00	0.000E+00	0.000E+00	23.112936

Initial Concentration Toxicity Screening Status

Endosulfan Sulfate

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	2.53E+01	ml/g
Kd Vadose 2	4.78E+00	ml/g
Rd Vadose 1	2.78E+02	
Rd Vadose 2	4.45E+01	
Screening Level	2.19E−02	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	25.91757
560B	2	0.00E+00	0.000E+00	0.000E+00	25.5720024
560C	3	0.00E+00	0.000E+00	0.000E+00	25.91757
560D	4	0.00E+00	0.000E+00	0.000E+00	25.341624
570A	5	0.00E+00	0.000E+00	0.000E+00	26.0327592
570B	6	0.00E+00	0.000E+00	0.000E+00	26.493516
570C	7	0.00E+00	0.000E+00	0.000E+00	25.341624
570D	8	0.00E+00	0.000E+00	0.000E+00	25.341624
570E	9	0.00E+00	0.000E+00	0.000E+00	26.493516
575A	10	0.00E+00	0.000E+00	0.000E+00	25.91757
575B	11	0.00E+00	0.000E+00	0.000E+00	26.493516
580A	12	0.00E+00	0.000E+00	0.000E+00	25.91757
581A	13	0.00E+00	0.000E+00	0.000E+00	25.341624
581B	14	0.00E+00	0.000E+00	0.000E+00	25.341624
581C	15	0.00E+00	0.000E+00	0.000E+00	24.6504888
581D	16	0.00E+00	0.000E+00	0.000E+00	25.341624
582A	17	0.00E+00	0.000E+00	0.000E+00	24.6504888
582B	18	0.00E+00	0.000E+00	0.000E+00	25.341624
PAA	19	7.30E−04	1.061E+03	2.881E−05	25.341624
PAB	20	0.00E+00	0.000E+00	0.000E+00	25.341624
PAC	21	0.00E+00	0.000E+00	0.000E+00	25.341624
PAD	22	0.00E+00	0.000E+00	0.000E+00	25.341624
PAE	23	0.00E+00	0.000E+00	0.000E+00	25.341624
PAF	24	0.00E+00	0.000E+00	0.000E+00	25.341624
PAG	25	0.00E+00	0.000E+00	0.000E+00	25.341624
PAH	26	0.00E+00	0.000E+00	0.000E+00	25.341624
PAI	27	0.00E+00	0.000E+00	0.000E+00	25.341624
WPAA	28	0.00E+00	0.000E+00	0.000E+00	25.341624

Initial Concentration Toxicity Screening Status

N-nitroso-di-n-propylamine

CRU 5 RI

Initial Mass and Concentration

Compound Type	Org	
Kd Vodose 1	1.72E-01	ml/g
Kd Vadose 2	3.24E-02	ml/g
Rd Vadose 1	2.88E+00	
Rd Vadose 2	1.29E+00	
Screening Level	1.20E-06	mg/l
Lambda	1.90E-03	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	0.00E+00	0.000E+00	0.000E+00	0.17577
560B	2	3.90E-02	5.668E+04	2.269E-01	0.1734264
560C	3	0.00E+00	0.000E+00	0.000E+00	0.17577
560D	4	0.00E+00	0.000E+00	0.000E+00	0.171864
570A	5	0.00E+00	0.000E+00	0.000E+00	0.1765512
570B	6	0.00E+00	0.000E+00	0.000E+00	0.179676
570C	7	0.00E+00	0.000E+00	0.000E+00	0.171864
570D	8	0.00E+00	0.000E+00	0.000E+00	0.171864
570E	9	0.00E+00	0.000E+00	0.000E+00	0.179676
575A	10	0.00E+00	0.000E+00	0.000E+00	0.17577
575B	11	0.00E+00	0.000E+00	0.000E+00	0.179676
580A	12	0.00E+00	0.000E+00	0.000E+00	0.17577
581A	13	0.00E+00	0.000E+00	0.000E+00	0.171864
581B	14	0.00E+00	0.000E+00	0.000E+00	0.171864
581C	15	0.00E+00	0.000E+00	0.000E+00	0.1671768
581D	16	0.00E+00	0.000E+00	0.000E+00	0.171864
582A	17	0.00E+00	0.000E+00	0.000E+00	0.1671768
582B	18	0.00E+00	0.000E+00	0.000E+00	0.171864
PAA	19	0.00E+00	0.000E+00	0.000E+00	0.171864
PAB	20	0.00E+00	0.000E+00	0.000E+00	0.171864
PAC	21	0.00E+00	0.000E+00	0.000E+00	0.171864
PAD	22	0.00E+00	0.000E+00	0.000E+00	0.171864
PAE	23	0.00E+00	0.000E+00	0.000E+00	0.171864
PAF	24	0.00E+00	0.000E+00	0.000E+00	0.171864
PAG	25	0.00E+00	0.000E+00	0.000E+00	0.171864
PAH	26	0.00E+00	0.000E+00	0.000E+00	0.171864
PAI	27	0.00E+00	0.000E+00	0.000E+00	0.171864
WPAA	28	0.00E+00	0.000E+00	0.000E+00	0.171864

Initial Concentration Toxicity Screening Status Requires Modeling 137

Chromium (Hex)

CRU 5 RI

Initial Mass and Concentration

Compound Type	Inorg	
Kd Vodose 1	3.70E+01	ml/g
Kd Vadose 2	3.70E+00	ml/g
Rd Vadose 1	4.06E+02	
Rd Vadose 2	3.46E+01	
Screening Level	1.80E−02	mg/l
Lambda	1.00E−50	1/day

Waste Area	Waste Area Number	Constituent Concentration (mg/kg)	Constituent Mass per Block (mg)	Kd based Initial Concentration (mg/l)	Kd Layer 1 (ml/g)
560A	1	1.460E+00	2.122E+06	3.946E−02	3.70E+01
560B	2	3.430E+00	4.985E+06	9.270E−02	3.70E+01
560C	3	1.720E+00	2.500E+06	4.649E−02	3.70E+01
560D	4	1.350E+00	1.962E+06	3.649E−02	3.70E+01
570A	5	1.670E+00	2.427E+06	4.514E−02	3.70E+01
570B	6	1.820E+00	2.645E+06	4.919E−02	3.70E+01
570C	7	2.090E+00	3.038E+06	5.649E−02	3.70E+01
570D	8	2.090E+00	3.038E+06	5.649E−02	3.70E+01
570E	9	1.130E+00	1.642E+06	3.054E−02	3.70E+01
575A	10	1.400E+00	2.035E+06	3.784E−02	3.70E+01
575B	11	1.130E+00	1.642E+06	3.054E−02	3.70E+01
580A	12	1.130E+00	1.642E+06	3.054E−02	3.70E+01
581A	13	1.460E+00	2.122E+06	3.946E−02	3.70E+01
581B	14	2.100E+00	3.052E+06	5.676E−02	3.70E+01
581C	15	9.800E−01	1.424E+06	2.649E−02	3.70E+01
581D	16	1.470E+00	2.137E+06	3.973E−02	3.70E+01
582A	17	1.380E+00	2.006E+06	3.730E−02	3.70E+01
582B	18	1.340E+00	1.948E+06	3.622E−02	3.70E+01
PAA	19	2.130E+00	3.096E+06	5.757E−02	3.70E+01
PAB	20	3.750E+00	5.450E+06	1.014E−01	3.70E+01
PAC	21	3.810E+00	7.384E+07	1.030E−01	3.70E+01
PAD	22	4.690E+00	4.999E+07	1.268E−01	3.70E+01
PAE	23	2.420E+00	3.752E+07	6.541E−02	3.70E+01
PAF	24	2.430E+00	3.532E+06	6.568E−02	3.70E+01
PAG	25	2.390E+00	3.474E+06	6.459E−02	3.70E+01
PAH	26	3.770E+00	5.480E+06	1.019E−01	3.70E+01
PAI	27	1.970E+00	2.863E+06	5.324E−02	3.70E+01
WPAA	28	1.410E+00	2.049E+06	3.811E−02	3.70E+01

Initial Concentration Toxicity Screening Status Requires Modeling 140

1919 - 6161

Attachment F.3.IV

Selection of Predominant Carcinogenic and Noncarcinogenic Constituents of Concern COCs Based on Relative Contributions to Total Risk Level and Hazard Index Over OU1, OU2, and OU4 Groundwater Pathway

TABLE F.3-IV-7
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
PERCHED GROUNDWATER PATHWAYS – FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY RESIDENT FARMER
OU4 FEMP

	OU4 ICLRs								OU4 HQs							
Constituent of Concern	Ingestion of Drinking Water	Ingestion of Vegetables and Fruits	Ingestion of Meat	Ingestion of Milk	Dermal Exposure While Bathing	Inhalation of VOCs from Home Water Use	Sum of Risks Across Pathways	% Contribution to Total Risk	Ingestion of Drinking Water	Ingestion of Vegetables and Fruits	Ingestion of Homegrown Meats	Ingestion of Milk Products	Dermal Exposure While Bathing	Inhalation of VOCs from Home Water Use	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides																
Actinium-227+7D	4.6E-04	NA	NA	NA	NA	NA	4.6E-04	0.0522	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-210+2D	9.0E-01	NA	NA	NA	NA	NA	9.0E-01	97.8261	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-238	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Proactinium-231	2.7E-04	NA	NA	NA	NA	NA	2.7E-04	0.0293	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	1.7E-03	NA	NA	NA	NA	NA	1.7E-03	0.1848	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-228+1D	1.5E-04	NA	NA	NA	NA	NA	1.5E-04	0.0163	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-228+7D	7.4E-05	NA	NA	NA	NA	NA	7.4E-05	0.0080	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	7.9E-06	NA	NA	NA	NA	NA	7.9E-06	0.0009	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235+1D	3.5E-07	NA	NA	NA	NA	NA	3.5E-07	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+2D	1.3E-05	NA	NA	NA	NA	NA	1.3E-05	0.0014	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds																
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs																
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs																
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics																
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	3.6E-02	1.9E-02	2.6E-03	1.1E-03	6.1E-05	0.0E+00	5.9E-02	0.1184
Arsenic	1.3E-02	4.3E-03	6.1E-04	7.4E-05	6.3E-06	0.0E+00	1.8E-02	1.9152	2.4E+01	8.2E+00	1.2E+00	1.4E-01	1.2E-02	0.0E+00	3.4E+01	67.3060
Barium	NA	NA	NA	NA	NA	NA	NA	NA	5.1E-06	2.2E-06	4.6E-06	4.3E-07	2.6E-06	0.0E+00	7.6E-06	0.0000
Beryllium	8.0E-07	2.5E-07	1.1E-08	4.2E-11	4.0E-09	0.0E+00	1.1E-06	NA	3.7E-05	1.1E-05	5.3E-07	1.9E-09	1.9E-07	0.0E+00	4.9E-05	0.0001
Boron	NA	NA	NA	NA	NA	NA	NA	NA	6.1E-04	6.1E-03	6.5E-04	4.9E-03	3.1E-06	0.0E+00	1.2E-02	0.0245
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	2.0E+00	2.3E+00	2.1E-01	1.5E+00	9.7E-03	0.0E+00	5.9E+00	11.8315
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA	9.8E-06	3.1E-06	7.2E-07	6.1E-07	4.9E-08	0.0E+00	1.4E-05	0.0000
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	1.7E-01	5.6E-02	5.9E-02	2.4E-02	6.4E-04	0.0E+00	3.1E-01	0.6157
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	1.7E-05	1.1E-05	6.3E-07	2.2E-06	1.4E-07	0.0E+00	3.0E-05	0.0001
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	1.5E-03	2.4E-03	1.2E-01	6.5E-04	1.9E-05	0.0E+00	1.2E-01	0.2455
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	2.1E-03	1.4E-03	1.2E-03	1.2E-03	1.4E-06	0.0E+00	5.7E-03	0.0114
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	2.5E-02	1.4E-02	4.7E-03	3.1E-03	1.3E-04	0.0E+00	4.7E-02	0.0946
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	3.6E-01	1.5E-01	1.0E-01	1.1E-01	1.1E-04	0.0E+00	7.3E-01	1.4522
Silver	NA	NA	NA	NA	NA	NA	NA	NA	2.1E-03	1.9E-03	9.1E-04	2.4E-02	1.1E-05	0.0E+00	2.9E-02	0.0584
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	3.2E+00	9.6E-01	1.6E+00	3.2E-01	8.0E-04	0.0E+00	6.0E+00	12.0676
Uranium	NA	NA	NA	NA	NA	NA	NA	NA	2.6E-01	8.3E-02	7.1E-04	8.8E-03	1.3E-03	0.0E+00	3.5E-01	0.7070
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	1.7E+00	5.3E-01	5.4E-02	1.8E-03	8.4E-03	0.0E+00	2.3E+00	4.5638
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	5.7E-05	2.6E-04	2.9E-03	1.1E-03	7.1E-06	0.0E+00	4.3E-03	0.0086
Total ICLR for Pathway [3]:	9.2E-01	4.3E-03	6.1E-04	7.4E-05	6.3E-06	0.0E+00			Total HI for Pathway[3]:	3.2E+01	1.2E+01	3.3E+00	2.1E+00	3.3E-02	0.0E+00	
Total ICLR for OU4:						9.2E-01			Total HI for OU4:						5.0E+01	

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum at risk levels/hazard quotients over all constituents of potential concern (including those less than a risk le
NA – Not applicable. Constituent not a CPC for media or pathway not applicable
ND – No data for toxicity assessment for exposure pathway.

TABLE F.3-IV-1
SELECTION OF PREDOMINANT CARCINOGENIC AND NONCARCINOGENIC CONSTITUENTS OF CONCERN(COCs)
FOR FATE AND TRANSPORT MODELING[1]
BASED ON RELATIVE CONTRIBUTIONS TO TOTAL RISK LEVEL AND HAZARD INDEX OVER OU1, OU2, AND OU4 -COMBINED
GROUNDWATER PATHWEAYS-GREAT MIAMI AQUIFER(GMA)-FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER

	ICLRs for OU1, OU2, and OU4 GMA					HQs for OU1, OU2, and OU4 GMA				
	Sum of ICLRs Across Pathways[3]			Sum of ICLRs Across Operable Units	% Contribution to Total ICLR for all OUs	Sum of HQs Across Pathways[3]			Sum of HQs Across Operable Units	% Contribution to Total HI for all OUs
Constituents of Concern[2]	OU1 GMA	OU2 GMA	OU4 GMA			OU1 GMA	OU2 GMA	OU4 GMA		
Radionuclides										
Actinium-227+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead-210+2D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	3.3E-07	NA	3.3E-07	0.001	NA	NA	NA	NA	NA
Plutonium-238	1.8E-06	NA	NA	1.8E-06	0.003	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Proactinium-231	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	9.5E-05	NA	NA	9.5E-05	0.149	NA	NA	NA	NA	NA
Radium-228+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	2.2E-06	1.2E-07	NA	2.3E-06	0.004	NA	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	8.6E-07	NA	NA	8.6E-07	0.001	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	2.4E-03	3.7E-04	2.8E-05	2.8E-03	4.404	NA	NA	NA	NA	NA
Uranium-235+1D	NA	3.2E-06	2.4E-06	5.6E-06	0.009	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	5.4E-04	2.0E-05	NA	5.6E-04	0.887	NA	NA	NA	NA	NA
Uranium-238+2D	2.0E-02	8.3E-04	4.5E-05	2.1E-02	32.852	NA	NA	NA	NA	NA
Volatile Organic Compounds										
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs										
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs										
Tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics										
Antimony	NA	NA	NA	NA	NA	2.2E+01	NA	NA	2.2E+01	4.091
Arsenic	4.0E-02	NA	NA	4.0E-02	62.412	7.5E+01	NA	NA	7.5E+01	14.090
Barium	NA	NA	NA	NA	NA	5.9E-01	NA	NA	5.9E-01	0.110
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE F.3-IV-1
SELECTION OF PREDOMINANT CARCINOGENIC AND NONCARCINOGENIC CONSTITUENTS OF CONCERN(COCs)
FOR FATE AND TRANSPORT MODELING[1]
BASED ON RELATIVE CONTRIBUTIONS TO TOTAL RISK LEVEL AND HAZARD INDEX OVER OU1, OU2, AND OU4-COMBINED
GROUNDWATER PATHWEAYS-GREAT MIAMI AQUIFER(GMA)-FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER

	ICLRs for OU1, OU2, and OU4 GMA					HQs for OU1, OU2, and OU4 GMA				
	Sum of ICLRs Across Pathways[3]			Sum of ICLRs Across Operable Units	% Contribution to Total ICLR for all OUs	Sum of HQs Across Pathways[3]			Sum of HQs Across Operable Units	% Contribution to Total HI for all OUs
Constituents of Concern[2]	OU1 GMA	OU2 GMA	OU4 GMA			OU1 GMA	OU2 GMA	OU4 GMA		
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	8.1E-01	NA	NA	8.1E-01	0.153
Mercury	NA	NA	NA	NA	NA	2.7E-01	NA	NA	2.7E-01	0.050
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	4.0E+02	2.4E+00	6.5E-01	4.1E+02	76.362
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Total ICLR for each OU [4]:

OU1	OU2	OU4
6.2E-02	1.3E-03	7.6E-05

Total ICLR over all OUs [5]: 6.3E-02

Total HI for each OU [4]:

OU1	OU2	OU4
5.1E+02	2.2E+01	8.6E-01

Total HI over all OUs [5]: 5.3E+02

Notes:

[1] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway in at least one operable unit.

[2] Groundwater exposure pathways evaluated include ingestion of drinking water, ingestion of fruits and vegetables, ingestion of meat, ingestion of milk products and dermal contact while bathing.

[3] Total risk levels/hazard indices presented for each OU were obtained from respective baseline human health risk assessments and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).

[4] Represents the sum of all risk levels/hazard indices over all COCs, exposure pathways and operable units.

NA-Not applicable.

TABLE F.3-IV-2
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
(GMA) GROUNDWATER PATHWAYS – FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER
OU1 FEMP

Constituent of Concern [2]	OU1 Cancer Risk Levels: Ingestion of Drinking Water	Ingestion of Vegetables and Fruits	Ingestion of Meat	Ingestion of Milk Products	Inhalation of VOCs	Dermal Contact While Bathing	Sum of Risks Across Pathways	% Contribution to Total Risk	OU1 Hazard Quotients: Ingestion of Drinking Water	Ingestion of Vegetables and Fruits	Ingestion of Meat	Ingestion of Milk Products	Inhalation of VOCs	Dermal Contact While Bathing	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides																
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-238	1.4E-06	4.3E-07	7.9E-12	NA	NA	NA	1.8E-06	0.0029	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+6D	6.6E-05	2.3E-05	4.3E-07	3.2E-06	NA	NA	9.5E-05	0.1523	NA	NA	NA	NA	NA	NA	NA	NA
Radium-228+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	1.1E-06	3.3E-07	1.3E-07	6.3E-07	NA	NA	2.2E-06	0.0035	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	6.6E-07	2.0E-07	5.2E-11	1.6E-10	NA	NA	8.6E-07	0.0014	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	1.6E-03	5.4E-04	4.0E-06	4.9E-05	NA	NA	2.4E-03	3.8520	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	4.1E-04	1.2E-04	9.1E-07	1.1E-05	NA	NA	5.4E-04	0.8723	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+2D	1.5E-02	4.5E-03	3.3E-05	4.1E-04	NA	NA	2.0E-02	32.1019	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds																
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs																
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs																
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics																
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	1.2E+01	7.9E+00	1.2E+00	4.7E-01	ND	2.3E-01	2.2E+01	4.2687
Arsenic	2.8E-02	9.9E-03	1.4E-03	1.7E-04	ND	8.40E-05	4.0E-02	63.7	5.5E+01	1.9E+01	2.6E+00	3.2E-01	ND	1.6E-01	7.5E+01	14.7014
Barium	NA	NA	NA	NA	NA	NA	NA	NA	2.5E-01	2.4E-01	9.2E-03	6.6E-02	ND	6.0E-04	5.9E-01	0.1147
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	4.1E-01	3.0E-01	1.4E-02	5.1E-02	ND	3.9E-02	8.1E-01	0.1594
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	3.3E-02	1.3E-02	2.2E-01	1.6E-03	ND	6.3E-04	2.7E-01	0.0525
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	NA	NA	NA	2.9E+02	6.6E+01	6.5E-01	8.0E+00	ND	1.7E+01	4.0E+02	79.0386
Total ICLR for Pathway [3]:	4.5E-02	1.5E-02	1.4E-03	6.4E-04	1.30E-13	8.40E-05			Total HI for Pathway [3]:	3.6E+02	1.2E+02	4.7E+00	9.0E+00	0.0E+00	1.7E+01	
Total ICLR for OU1:						6.2E-02			Total HI for OU1:						5.1E+02	

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA – Not applicable. Constituent not a CPC for media or exposure pathway not applicable.
ND – No data for toxicity assessment for exposure pathway.

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TABLE F.3-IV-3
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
(GMA) GROUNDWATER PATHWAYS – FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER
OU2 FEMP

	OU2 ICLRs						OU2 HQs				
	Groundwater Affected										
Constituent of Concern [2]	Ingestion of Beef	Ingestion of Milk	Ingestion of Homegrown Produce	Ingestion of Groundwater	Sum of Risks Across Pathways	%Contribution to Total Risk	Ingestion of Groundwater	Ingestion of Homegrown Produce	Dermal Contact with Groundwater	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides											
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	NA	NA	3.3E-07	3.3E-07	0.02579	NA	NA	NA	NA	NA
Plutonium-238	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+5D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-228+6D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-228+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium-90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	NA	NA	NA	1.2E-07	1.2E-07	0.00938	NA	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	4.9E-07	5.9E-06	5.5E-05	3.7E-04	3.7E-04	28.91755	NA	NA	NA	NA	NA
Uranium-235	NA	3.2E-07	2.9E-06	NA	3.2E-06	0.25166	NA	NA	NA	NA	NA
Uranium-235/238(U-235+1D)	NA	NA	NA	2.0E-05	2.0E-05	1.56311	NA	NA	NA	NA	NA
Uranium-238+2D	9.5E-07	1.1E-05	1.1E-04	7.1E-04	8.3E-04	65.02149	NA	NA	NA	NA	NA
Semivolatile Organic Compounds											
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds											
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs											
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs											
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics											
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium, Total	NA	NA	NA	NA	NA	NA	1.7E+01	2.5E+00	2.4E+00	2.4E+00	10.9091

TABLE F.3-IV-3
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
(GMA) GROUNDWATER PATHWAYS -- FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER
OU2 FEMP

Constituent of Concern [2]	OU2 ICLRs						OU2 HQs				
	Groundwater Affected										
	Ingestion of Beef	Ingestion of Milk	Ingestion of Homegrown Produce	Ingestion of Groundwater	Sum of Risks Across Pathways	%Contribution to Total Risk	Ingestion of Groundwater	Ingestion of Homegrown Produce	Dermal Contact with Groundwater	Sum of HQs Across Pathways	% Contribution to Hazard Index
Total ICLR for Pathway[3]:	1.5E-06	1.8E-05	1.6E-04	1.1E-03			1.7E+01	2.5E+00	2.5E+00		
Total ICLR for OU2:				1.3E-03					2.2E+01		
Total HI for Pathway[3]:											
Total HI for OU2:											

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard index(ices) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA -- Not applicable. Constituent not a CPC for media or exposure pathway not applicable.
ND -- No data for toxicity assessment for exposure pathway.

TABLE F.3-IV-4
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
GROUNDWATER PATHWAYS - FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY RESIDENT FARMER
OU4 FEMP

	OU4 ICLRs								OU4 HQs							
Constituent of Concern	Ingestion of Drinking Water	Ingestion of Vegetables and Fruits	Ingestion of Meat	Ingestion of Milk	Dermal Exposure While Bathing	Inhalation of VOCs from Home Water Use	Sum of Risks Across Pathways	% Contribution to Total Risk	Ingestion of Drinking Water	Ingestion of Vegetables and Fruits	Ingestion of Homegrown Meats	Ingestion of Milk Products	Dermal Exposure While Bathing	Inhalation of VOCs from Home Water Use	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides																
Cesium-137+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Neptunium-237+1D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-238	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Technetium-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-234	2.0E-05	7.6E-06	5.4E-08	6.6E-07	NA	NA	2.6E-05	37.3	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235+1D	1.7E-06	6.6E-07	4.6E-09	5.7E-08	NA	NA	2.4E-06	3.19	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+2D	3.2E-05	1.2E-05	8.4E-08	1.0E-06	NA	NA	4.5E-05	59.3	NA	NA	NA	NA	NA	NA	NA	NA
Semivolatile Organic Compounds																
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides/PCBs							NA									
PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs							NA									
Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics							NA									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium	NA	NA	NA	NA	NA	NA	NA	NA	6.3E-01	2.0E-01	1.7E-03	2.1E-02	3.1E-03	0.0E+00	8.5E-01	99.4
Total ICLR for Pathway [3]:	5.4E-05	2.0E-05	1.4E-07	1.7E-06	0.0E+00	0.0E+00			Total HI for Pathway [3]:	6.3E-01	2.0E-01	1.7E-03	2.1E-02	3.1E-03	0.0E+00	
Total ICLR for OU4:						7.6E-05			Total HI for OU4:						8.6E-01	

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a ris
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.

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TABLE F.3-IV-5
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
PERCHED GROUNDWATER PATHWAYS – FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER
OU1 FEMP

	OU1 ICLRs					OU1 HQs				
Constituent of Concern [2]	Ingestion of Drinking Water	Inhalation of VOCs	Dermal Contact while Bathing	Sum of Risks Across Pathways	% Contribution to Total Risk	Ingestion of Drinking Water	Inhalation of VOCs	Dermal Contact while Bathing	Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides										
Cesium-137+1D	1.2E-08	NA	NA	1.2E-08	0.00007	NA	NA	NA	NA	NA
Neptunium-237+1D	8.1E-05	NA	NA	8.1E-05	0.00485	NA	NA	NA	NA	NA
Plutonium-238	5.3E-06	NA	NA	5.3E-06	0.00032	NA	NA	NA	NA	NA
Plutonium-239/240	5.6E-07	NA	NA	5.6E-07	0.00003	NA	NA	NA	NA	NA
Radium-226+5D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Radium-226+8D	2.8E-03	NA	NA	2.8E-03	0.16766	NA	NA	NA	NA	NA
Radium-228+1D	NA	NA	NA	0.0E+00	NA	NA	NA	NA	NA	NA
Strontium-90	7.1E-05	NA	NA	7.1E-05	0.00425	NA	NA	NA	NA	NA
Technetium-99	1.7E-04	NA	NA	1.7E-04	0.01018	NA	NA	NA	NA	NA
Thorium-228+7D	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-230	1.9E-07	NA	NA	1.9E-07	0.00001	NA	NA	NA	NA	NA
Thorium-232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thorium-232+10D	4.2E-07	NA	NA	4.2E-07	0.00003	NA	NA	NA	NA	NA
Uranium-234	1.1E-01	NA	NA	1.1E-01	6.58883	NA	NA	NA	NA	NA
Uranium-235/236 (U-235+1D)	2.1E-02	NA	NA	2.1E-02	1.25749	NA	NA	NA	NA	NA
Uranium-238+2D	4.4E-01	NA	NA	4.4E-01	26.34731	NA	NA	NA	NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	1.2E-03	NA	NA	1.2E-03	0.07188	NA	NA	NA	NA	NA
Benzo(a)pyrene	8.0E-03	NA	NA	8.0E-03	0.47904	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	9.8E-04	NA	NA	9.8E-04	0.05868	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	4.2E-04	NA	NA	4.2E-04	0.02515	NA	NA	NA	NA	NA
Chrysene	3.5E-05	NA	NA	3.5E-05	0.00210	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	2.2E-03	NA	NA	2.2E-03	0.13174	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.2E-03	NA	NA	2.2E-03	0.13174	NA	NA	NA	NA	NA
Pentachlorophenol	6.6E-04	NA	1.4E-02	1.5E-02	0.87784	1.8E-01	ND	4.0E+00	4.2E+00	0.0708
Volatile Organic Compounds										
Tetrachloroethene	2.0E-04	2.9E-05	1.6E-04	3.9E-04	0.02329	3.8E-01	ND	3.1E-01	6.9E-01	0.0117
Vinyl Chloride	5.1E-02	3.0E-02	3.1E-03	8.4E-02	5.03593	NA	NA	NA	NA	NA
Pesticides/PCBs										
PCBs	3.1E-02	NA	8.3E-01	8.6E-01	51.55689	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCDDs/PCDFs										
Heptachlorodibenzo-p-dioxin	3.9E-05	NA	4.9E-03	4.9E-03	0.29575	NA	NA	NA	NA	NA
Heptachlorodibenzofuran	8.2E-05	NA	1.0E-02	1.0E-02	0.60371	NA	NA	NA	NA	NA
Hexachlorodibenzo-p-dioxin	3.1E-04	NA	3.8E-02	3.8E-02	2.29401	NA	NA	NA	NA	NA
Hexachlorodibenzofuran	4.9E-04	NA	6.1E-02	6.1E-02	3.68204	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	7.4E-08	NA	9.4E-04	9.5E-04	0.05673	NA	NA	NA	NA	NA
Octachlorodibenzofuran	4.5E-06	NA	5.7E-04	5.7E-04	0.03440	NA	NA	NA	NA	NA
Pentachlorodibenzofuran	4.3E-04	NA	5.3E-02	5.3E-02	3.19940	NA	NA	NA	NA	NA
Tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachlorodibenzofuran	2.2E-03	NA	2.4E-04	2.4E-03	0.14811	NA	NA	NA	NA	NA
Inorganics										
Antimony	NA	NA	NA	NA	NA	6.5E+01	ND	1.3E+00	6.6E+01	1.1237
Arsenic	3.0E-02	NA	9.2E-05	3.0E-02	1.80192	5.8E+01	ND	1.7E-01	5.8E+01	0.9859
Barium	NA	NA	NA	NA	NA	7.7E-01	ND	2.4E-03	7.7E-01	0.0131
Beryllium	2.4E-03	NA	6.9E-04	3.1E-03	0.18503	1.1E-01	ND	3.2E-02	1.4E-01	0.0024
Boron	NA	NA	NA	NA	NA	8.9E-01	ND	5.1E-02	9.4E-01	0.0159
Cadmium	NA	NA	NA	NA	NA	3.2E+00	ND	1.9E-01	3.4E+00	0.0575
Chromium, hexavalent	NA	NA	NA	NA	NA	7.1E-01	ND	8.1E-02	7.9E-01	0.0134
Cobalt	NA	NA	NA	NA	NA	1.5E-01	ND	3.9E-04	1.5E-01	0.0025
Copper	NA	NA	NA	NA	NA	6.5E-01	ND	ND	6.5E-01	0.0110
Cyanide	NA	NA	NA	NA	NA	4.9E+00	ND	ND	4.9E+00	0.0831
Lead	NA	NA	NA	NA	NA	ND	ND	ND	NA	NA
Manganese	NA	NA	NA	NA	NA	4.7E-01	ND	4.5E-02	5.2E-01	0.0087
Mercury	NA	NA	NA	NA	NA	2.0E+00	ND	3.8E-02	2.0E+00	0.0345
Molybdenum	NA	NA	NA	NA	NA	6.3E+02	ND	4.8E+00	6.3E+02	10.7593

TABLE F.3-IV-5
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
PERCHED GROUNDWATER PATHWAYS - FUTURE LAND USE, FUTURE SOURCE TERM
RME ON-PROPERTY FARMER
OU1 FEMP

	OU1 ICLRs					OU1 HQs				
Constituent of Concern [2]	Ingestion of Drinking Water	Inhalation of VOCs	Dermal Contact while Bathing	Sum of Risks Across Pathways	% Contribution to Total Risk	Ingestion of Drinking Water	Inhalation of VOCs	Dermal Contact while Bathing	Sum of HQs Across Pathways	% Contribution to Hazard Index
Nickel	NA	NA	NA	NA	NA	2.8E+00	ND	8.4E-03	2.8E+00	0.0493
Silver	NA	NA	NA	NA	NA	3.7E-01	ND	ND	3.7E-01	0.0063
Thallium	NA	NA	NA	NA	NA	3.0E+02	ND	8.5E-01	3.0E+02	5.0992
Uranium, Total	NA	NA	NA	NA	NA	4.8E+03	ND	2.8E+02	4.8E+03	82.3729
Vanadium	NA	NA	NA	NA	NA	5.6E+00	ND	3.2E-01	5.9E+00	0.1003
Total ICLR for Pathway [3]:	7.5E-01	3.0E-02	8.9E-01	Total HI for Pathway[3]:		5.6E+03	0.0E+00	2.7E+02		
Total ICLR for OU1:			1.7E+00	Total HI for OU1:				5.9E+03		

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.
ND - No data for toxicity assessment for exposure pathway.

TABLE F.3-IV-6
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
PERCHED GROUNDWATER USER - FUTURE, SOLID WASTE LANDFILL[4]
OU2 FEMP

	OU2 ICLRs					OU2 HIs				
Constituent of Concern [2]	Ingestion of Groundwater			Sum of Risks Across Pathways	% Contribution to Total Risk				Sum of HQs Across Pathways	% Contribution to Hazard Index
Radionuclides										
Cesium-137+1D	NA			NA	NA				NA	NA
Neptunium-237+1D	NA			NA	NA				NA	NA
Plutonium-238	NA			NA	NA				NA	NA
Plutonium-239/240	NA			NA	NA				NA	NA
Radium-226+5D	NA			NA	NA				NA	NA
Radium-226+8D	NA			NA	NA				NA	NA
Radium-226+1D	NA			NA	NA				NA	NA
Strontium-90	NA			NA	NA				NA	NA
Technetium-99	1.6E-06			1.6E-06	0.0340				NA	NA
Thorium-228+7D	NA			NA	NA				NA	NA
Thorium-230	NA			NA	NA				NA	NA
Thorium-232	NA			NA	NA				NA	NA
Thorium-232+10D	NA			NA	NA				NA	NA
Uranium-234	NA			NA	NA				NA	NA
Uranium-235/238 (U-235+1D)	NA			NA	NA				NA	NA
Uranium-238+2D	NA			NA	NA				NA	NA
Semivolatile Organic Compounds										
Benzo(a)anthracene	NA			NA	NA				NA	NA
Benzo(a)pyrene	NA			NA	NA				NA	NA
Benzo(b)fluoranthene	NA			NA	NA				NA	NA
Benzo(k)fluoranthene	NA			NA	NA				NA	NA
Carbazole	5.3E-03			5.3E-03	100.0000				NA	NA
Chrysene	NA			NA	NA				NA	NA
Dibenzo(a,h)anthracene	NA			NA	NA				NA	NA
Indeno(1,2,3-cd)pyrene	NA			NA	NA				NA	NA
Pentachlorophenol	NA			NA	NA				NA	NA
Volatile Organic Compounds										
Tetrachloroethene	NA			NA	NA				NA	NA
Vinyl Chloride	NA			NA	NA				NA	NA
Pesticides/PCBs										
PCBs	NA			NA	NA				NA	NA
Aroclor 1248	NA			NA	NA				NA	NA
Aroclor 1254	NA			NA	NA				NA	NA
Aroclor 1260	NA			NA	NA				NA	NA
PCDDs/PCDFs										
Heptachlorodibenzo-p-dioxin	NA			NA	NA				NA	NA
Heptachlorodibenzofuran	NA			NA	NA				NA	NA
Hexachlorodibenzo-p-dioxin	NA			NA	NA				NA	NA
Hexachlorodibenzofuran	NA			NA	NA				NA	NA
Octachlorodibenzo-p-dioxin	NA			NA	NA				NA	NA
Octachlorodibenzofuran	NA			NA	NA				NA	NA
Pentachlorodibenzofuran	NA			NA	NA				NA	NA
Tetrachlorodibenzo-p-dioxin	NA			NA	NA				NA	NA
Tetrachlorodibenzofuran	NA			NA	NA				NA	NA
Inorganics										
Antimony	NA			NA	NA				NA	NA
Arsenic	NA			NA	NA				NA	NA
Barium	NA			NA	NA				NA	NA
Beryllium	NA			NA	NA				NA	NA
Boron	NA			NA	NA				NA	NA
Cadmium	NA			NA	NA				NA	NA
Chromium, hexavalent	NA			NA	NA				NA	NA
Cobalt	NA			NA	NA				NA	NA
Copper	NA			NA	NA				NA	NA
Cyanide	NA			NA	NA				NA	NA
Lead	NA			NA	NA				NA	NA
Manganese	NA			NA	NA				NA	NA
Mercury	NA			NA	NA				NA	NA

TABLE F.3-IV-6
SUMMARY OF CARCINOGENIC COCs ASSOCIATED WITH RISK LEVELS EXCEEDING 1E-07 [1]
AND TOXICANTS ASSOCIATED WITH HAZARD QUOTIENTS EXCEEDING 1E-01
PERCHED GROUNDWATER USER - FUTURE, SOLID WASTE LANDFILL[4]
OU2 FEMP

	OU2 ICLRs					OU2 His				
Constituent of Concern [2]	Ingestion of Groundwater			Sum of Risks Across Pathways	% Contribution to Total Risk				Sum of HQs Across Pathways	% Contribution to Hazard Index
Molybdenum	NA			NA	NA				NA	NA
Nickel	NA			NA	NA				NA	NA
Silver	NA			NA	NA				NA	NA
Thallium	NA			NA	NA				NA	NA
Uranium, Total	NA			NA	NA				NA	NA
Vanadium	NA			NA	NA				NA	NA
Total ICLR for Pathway [3]:	5.3E-03									
Total ICLR for OU2:	5.3E-03									

Notes:
[1] As a conservative measure, risk levels for carcinogenic chemicals include those determined for PAHs using the slope factor for benzo(a)pyrene.
[2] Constituents of concern presented include those associated with a risk level(s) and/or a hazard quotient(s) that exceed a 1E-07 and 1E-01, respectively, for at least one exposure pathway.
[3] Total risk levels/hazard indices presented were obtained from the baseline human health risk assessment and represent the sum of all risk levels/hazard quotients over all constituents of potential concern (including those less than a risk level of 1E-07 for carcinogens, and those less than a hazard quotient of 1E-01 for toxicants).
[4] This receptor represents one of two users of perched water, the other being the child who is a perched water user, but the risk is lowere for the child.
NA - Not applicable. Constituent not a CPC for media or exposure pathway not applicable.