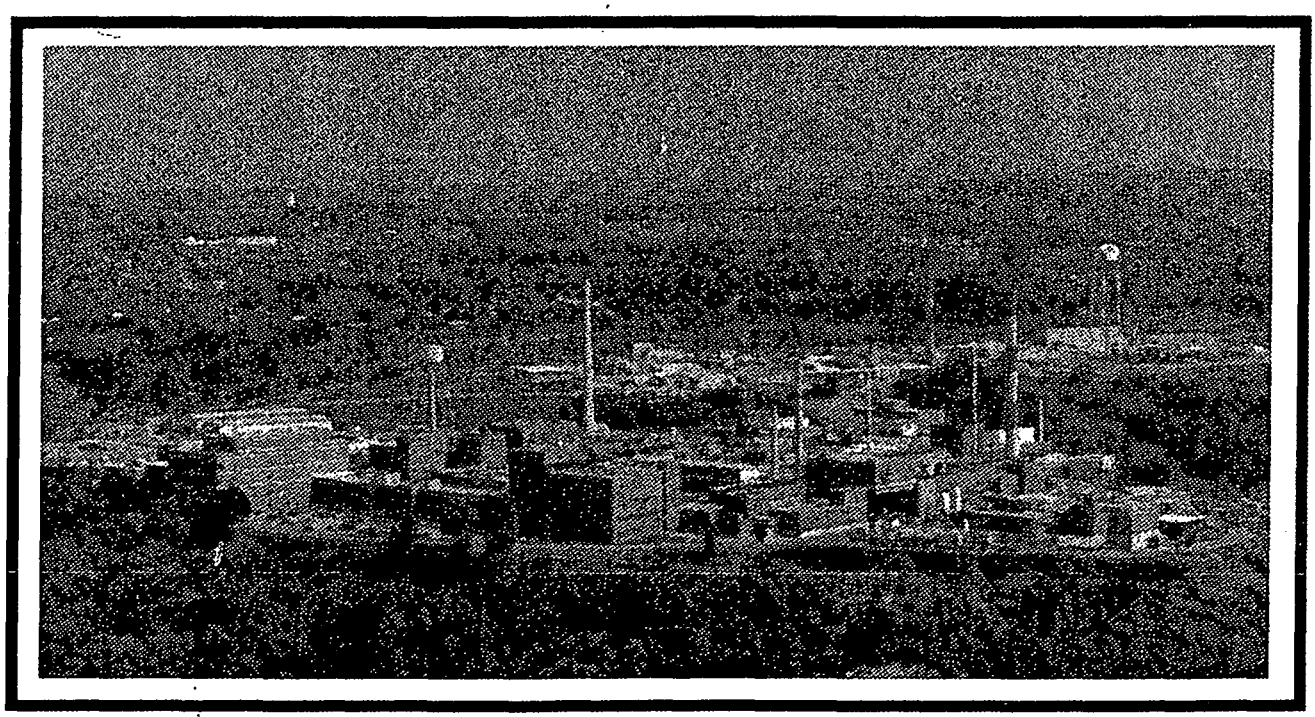
EG&G MOUND-30-03-04-02--9611130040

MOUND

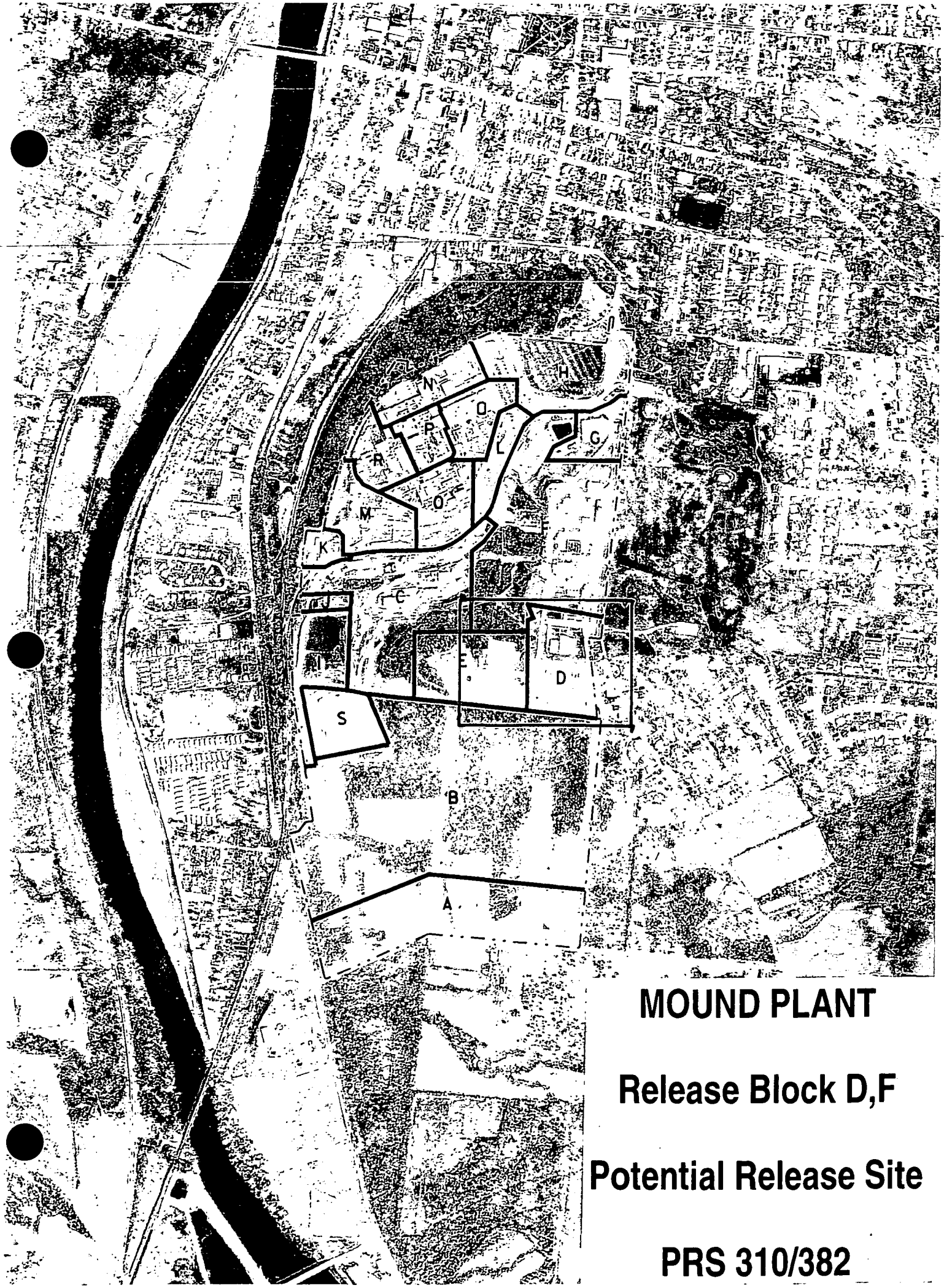
Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 310/382



PRS 310/382

REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comments.	May 8, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Oct. 10, 1996

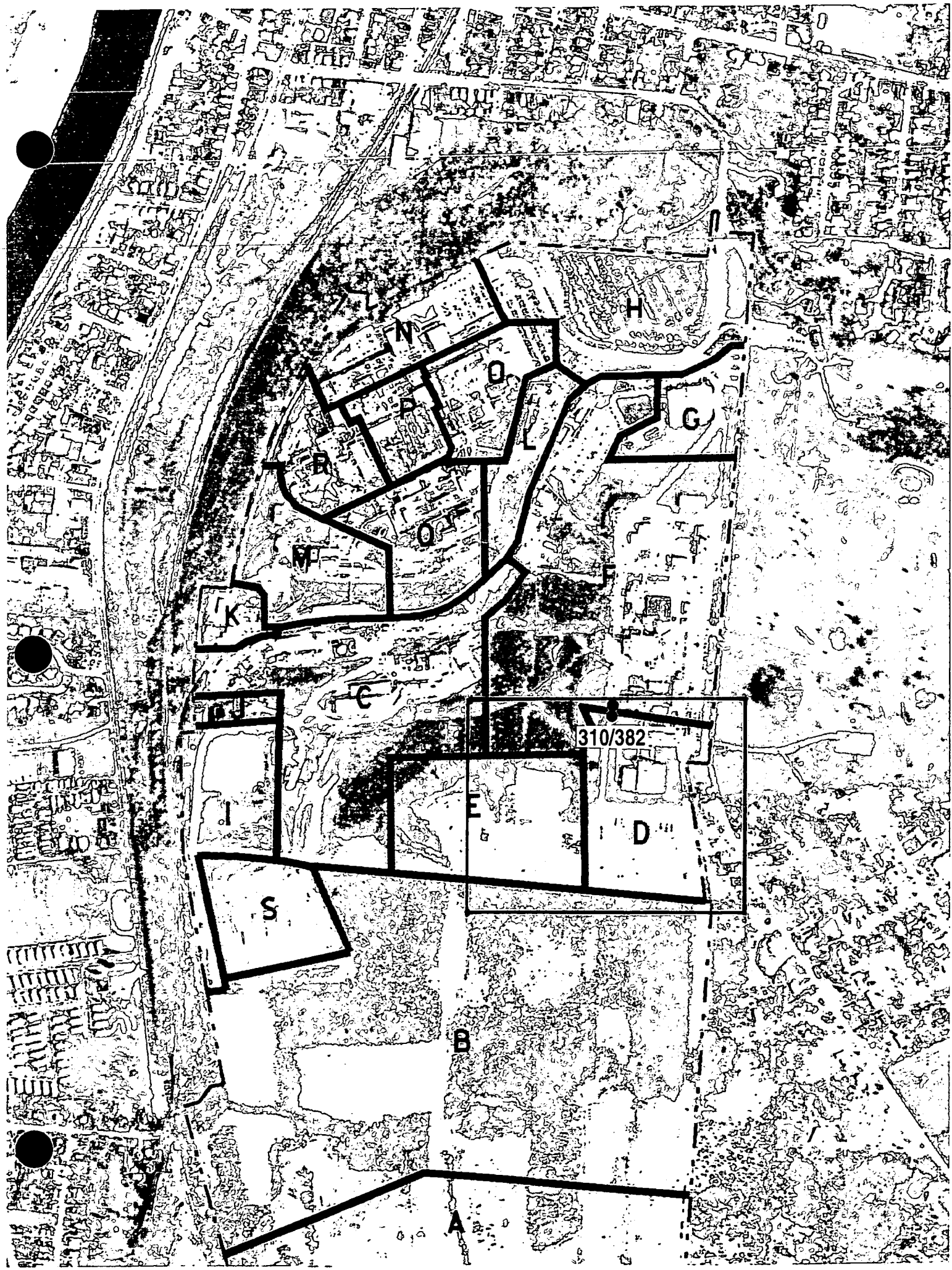


MOUND PLANT

Release Block D,F

Potential Release Site

PRS 310/382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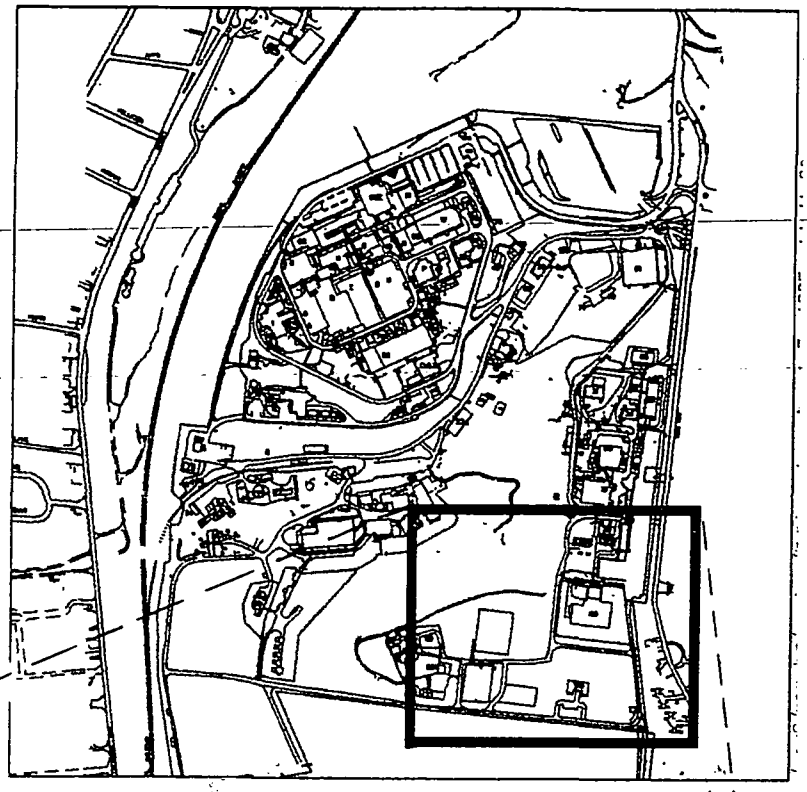
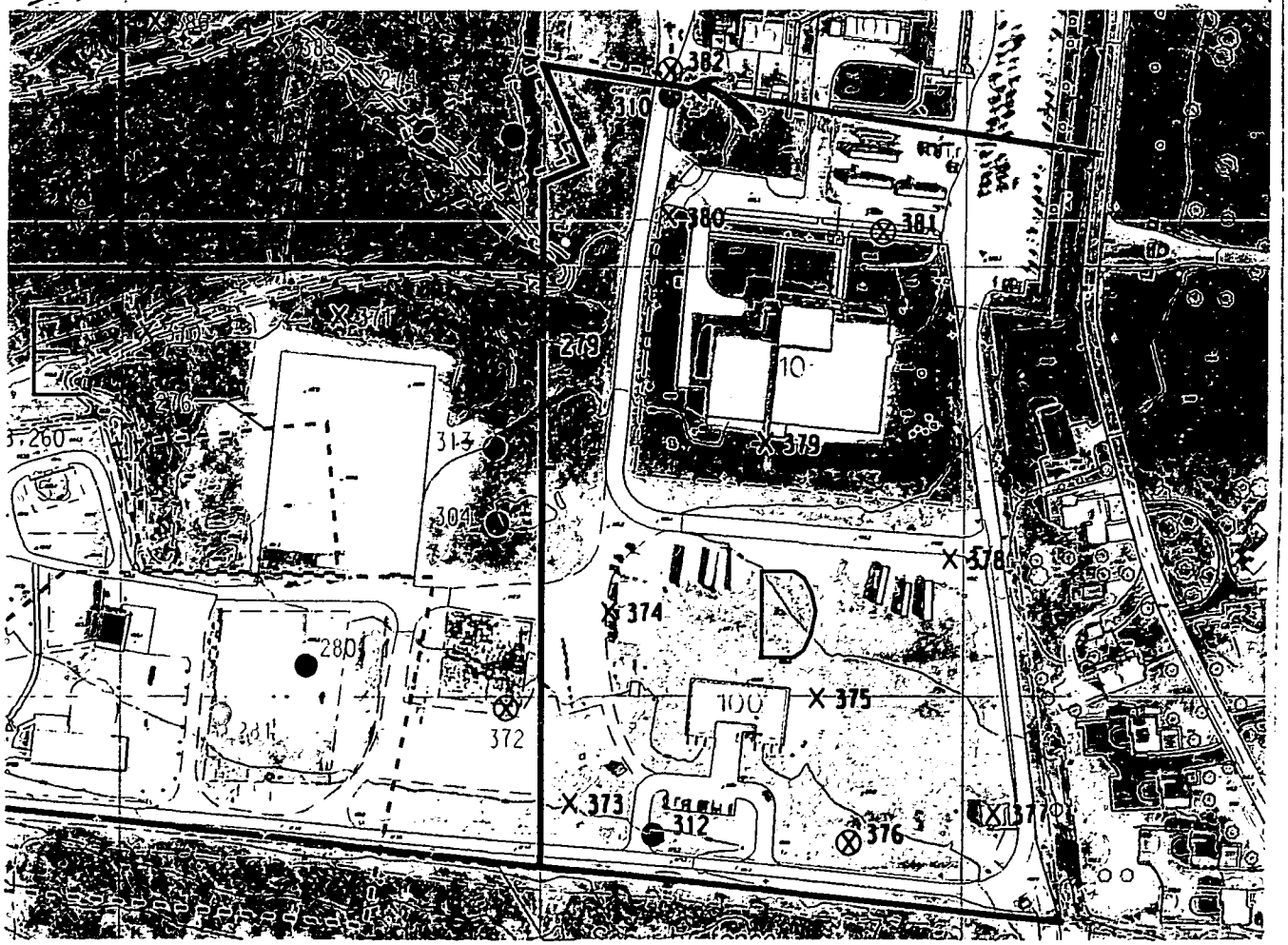
MOUND PLANT

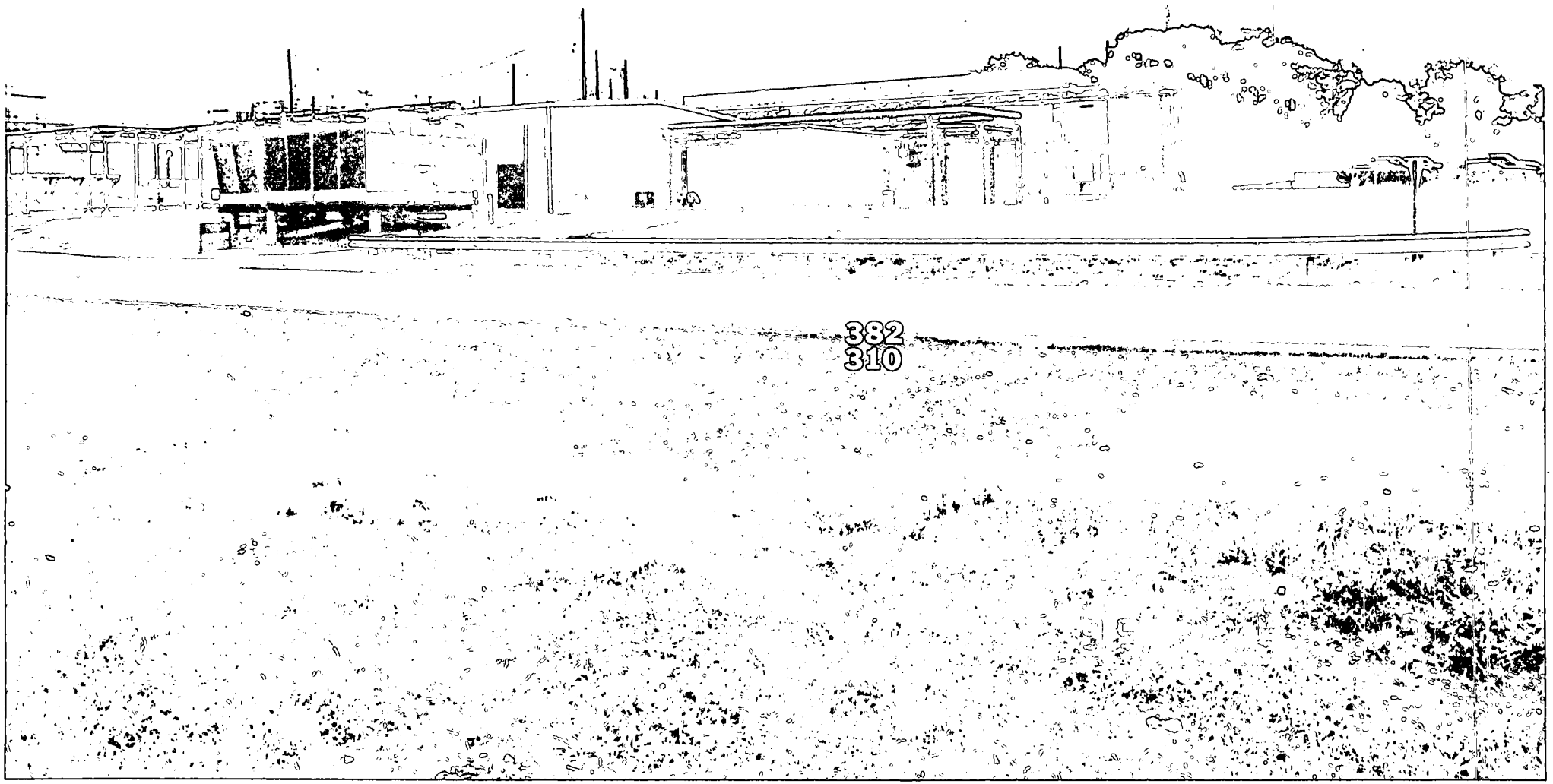
Release Block D,F

Potential Release Site

PRS 310/382






382
310

PRS 310/382

PRS HISTORY:

PRS 310 and PRS 382 are two co-located soils locations. PRS 310/382 is located just off the Mound Plant road, approximately 100 feet southeast of Building 95. PRS 310 was created due to a cesium detection.[2] PRS 382 was created from relative soil gas information (Petrex).[3]

No hazardous or radioactive events or processes are known to have occurred in this area. Based on historical activities from nearby buildings, only isolated activity from thorium and/or plutonium could be expected.

CONTAMINATION:

In 1983, 270 pCi/g of cesium-137 was reported in a surface sample at PRS 310/382.[2] Neighboring sample locations did not indicate the presence of radiological contamination.[2] The site was cleaned up immediately after the cesium-137 results became available.[2]

In March 1995, elevated levels of halogenated hydrocarbons (Petrex soil gas) were reported at PRS 310/382.[3] No radiological contamination was detected during radiological field sampling (fidler) or radiological laboratory analysis (Mound soil screening).[3]

In the summer of 1995, PRS 310/382 and its surrounding soil were sampled as part of the Other Soils Characterization. PRS 310/382 and four soil locations located 10 feet north, south, east and west of PRS 310/382 were sampled for organics (organic vapor analyzer) metals (x-ray fluoroscope) and radionuclides (field detection via fidler and lab analysis via Mound soil screening). Sample depth was 0 to 3 feet (refusal at 3 feet). Results showed:

1) No radioactivity in soil was found above field action levels. Field action levels for radionuclides were set at or below Mound's "as low as reasonably achievable" (ALARA) levels.[4, 5]
2) No metal contaminants in soil were found above field action levels. Field action levels for metals were set below soil guideline values.[4, 6]

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, Final, December 1994. (pages 5-6.1).
2) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey Report, June 1993 (pages 7-8).
3) OU5, Operational Area Phase I Investigation, Non-AOC Report, Vol. II, Appendices A-G, June 95, Final (pages 9-14).
6) Risk Based Soil Guideline Values, December 1995, Final, Revision 0. (pages 21-24)

OTHER REFERENCES:

4) Draft, Other Soils Characterization Report, January 1996 (pages 15-16).
5) Other Soils Field Sampling Data (pages 17-20).

PREPARED BY:

Richard Neff, DOE Technical Support Staff
Joseph C. Geneczko, Member of EG&G Technical Staff
George Liebson, Member of EG&G Technical Staff

PRS 310/382
(SUPPLEMENTAL DATA)

CONTAMINATION:

In February 1996, PRS 382 was sampled as part of the Soil Gas Confirmation Investigation.[7] This investigation was a second phase to the original OU-5 Operational Area Phase I Investigation (also known as the 1994 PETREX Soil Gas Investigation).

PRS 382 was sampled to a depth of 3 feet (sample #000012). The soil sample was analyzed by laboratories outside of Mound for volatiles, semivolatiles, PCBs, pesticides, metals, radionuclides and explosives.

Results showed:

A) All radionuclides were detected at concentrations below either federal regulations[8] or the 10^{-6} Risk-Based Soil Guideline Values for Construction Workers[6] with the exception of the following:

Contaminant	Maximum Concentration Detected	Guideline Criteria
Cobalt-60	0.13 pCi/g[7] (in soil)	0.10 pCi/g[6] (in soil)

NOTE: mg/kg = milligram per kilogram

B) All volatiles, semivolatiles and metals concentrations were below the 10^{-6} Risk-Based Soil Guidelines Values.[6, 7]

C) No pesticides, explosives or PCBs, were detected.[7]

D) The contamination level in the soil does not adversely affect the quality of groundwater at potential drinking water sources.[9]

SUPPLEMENTAL REFERENCES:

7) Soil Gas Confirmation Sampling Results 3/6/96. (pages 26-31)
8) Code of Federal Regulations, 40 CFR 192.12 and 40 CFR 192.41.
9) Soil Screening Level Calculations, March 25, 1996. (pages 32-39)

MOUND PLANT
PRS 382
SOIL CONTAMINATION - BUILDING 95

RECOMMENDATION:

Potential Release Site (PRS) 382 was created due to a cesium detection. The cesium at PRS 382 has subsequently been removed and sampling conducted in 1995 indicated that no cesium was present. Historically, no other radionuclides have been a concern at this location. All Plutonium levels were at or below the 10^{-5} Risk Based Guideline Values. All Thorium levels were at or below the 10^{-5} Risk Based Guideline Values and below the regulatory standard of 5pCi/g. All volatiles, semi-volatiles, and metals concentrations are below their respective 10^{-6} Risk Based Guideline Values. No pesticides, explosives, or polychlorinated biphenyls (PCBs) were detected. Additionally, calculations show that all organic compounds detected in soil in Release Block D do not adversely affect the quality of groundwater at potential drinking water sources. Therefore, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 5/8/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 5/8/96 (date)

OHIO EPA: Brian K. Nickel, Project Manager — 5/8/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 5/15/96 to 6/15/96.

☒ No comments were received during the comment period.

☐ Comment responses can be found on page_____ of this package.

REFERENCE MATERIAL

FOR

PRS310/382

Document Control No. _____

Environmental Restoration Program

OPERABLE UNIT 9 SITE SCOPING REPORT: VOLUME 12 – SITE SUMMARY REPORT

MOUND PLANT
MIAMISBURG, OHIO

December 1994

Final

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

	Description of History and Nature of Waste Handling					Hazardous Conditions and Incidents			Environmental Data		
No.	Site Name	Location	Status	Potential Hazardous Substances	Ref	Releases	Media	Ref	Analytes[a]	Results	Ref
300	Area 19, Underground Waste Transfer Line	G-6 G-7 G-8 G-9	Historical	Plutonium-238, Nitric acid	1, 4, 5, 18	Plutonium-238	S	1, 6, 18	14	Tables B.1, B.6, B.7, and B.8	6, 8
301	Building 38 In-Line Incinerator	G-9	Historical	Plutonium-238	2, 4	None Suspected D&D 1986			No Data - pending verification		
302	Area D, Acid Leach Field	H-8 H-9 G-8 G-9	Historical	Plutonium-238, Thorium	1, 4, 5, 18	Plutonium-238	S	6	4, 6 14	Tables B.6, B.7, and B.8 Table B.1 (Table IV.10 in Ref. 6)	8 6
303	Warehouse 14 (AKA Pad 14)	G- 9	Grounds	Thorium sludge constituents Plutonium-238	4	None Suspected			14	Table B.9 RSS[c] Locations C0127 and C0128 (Appendix E in Ref. 6)	6
304	Excavated Materials Disposal Area (AKA Rader's Hill)	I-8	Grounds	Thorium	4	Thorium < 2 pci/gm	S	6	14	Table B.1	6
305	SM Stack	G-9	In service	Plutonium-238	4	None suspected beyond routine emissions	A	4, 18	No Data		
306	SM/PP Hill Seep 0609	L-9	NA	None suspected	5, 18	None suspected			No Data		
307	Site Survey Project Potential Hot Spot Location C0007	E-9	Grounds	Thorium	6	Isolated activity from unknown source			14	Table B.9 (Appendix E in Ref. 6)	6
308	Site Survey Project Potential Hot Spot Location C0028	F-10	Grounds	Thorium	6						
309	Site Survey Project Potential Hot Spot Location S0307	F-9	Grounds	Thorium	6						
310	Site Survey Project Potential Hot Spot Location S0647	H-9	Grounds	Cesium-137	6				15	Table B.9 (Appendix E in Ref. 6)	6

Page 6

1 - Soil Gas Survey - Freon 11, Freon 113, Trans-1,2-Dichloroethylene, Cis-1,2-Dichloroethylene, 1,1,1-Trichloroethane, Perchloroethylene, Trichloroethylene, Toluene
2 - Gamma Spectroscopy - Thorium-228, -230, Cobalt-60, Cesium-137, Radium-224, -226, -228, Americium-241, Actinium-227, Bismuth-207, Bismuth-210m, Potassium-40
3 - Target Analyte List
4 - Target Compound List (VOC)
5 - Target Compound List (SVOC)
6 - Target Compound List (Pesticides/Polychlorinated Biphenyl)
7 - Dioxins/Furans
8 - Extractable Petroleum Hydrocarbons (EPH)/Total Petroleum Hydrocarbons (TPH)
9 - Lithium
10 - Nitrate/Nitrite
11 - Chloride
12 - Explosives
13 - Plutonium-238
14 - Plutonium-238, Thorium-232
15 - Cobalt-60, Cesium-137, Radium-226, Americium-241
16 - Tritium

Reference List

1. DOE 1986 "Phase I: Installation Assessment Mound [DRAFT]."
2. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
3. DOE 1992c "Mound Plant Underground Storage Tank Program Plan & Regulatory Status Review (Final)."
4. DOE 1993a "Site Scoping Report: Vol. 7 - Waste Management (FINAL)."
5. EPA 1988a "Preliminary Review/Visual Site Inspection for RCRA Facility Assessment of Mound Plant"
6. DOE 1993d "Operable Unit 9, Site Scping Report: Vol. 3 - Radiological Site Survey (FINAL)."
7. DOE 1993c "Operable Unit 3, Misc. Sites Limited Field Investigation Report."
8. DOE 1992d "Reconnaissance Sampling Report Decontamination & Decommissioning Areas, OU6, (FINAL)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scpoing Report: Vol. 9 - Spills and Response Actions (FINAL)."
11. Styron and Meyer 1981 "Potable Water Standards Project: Final Report."
12. DOE 1993b "Reconnaissance Sampling Report - Soil Gas Survey & Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (FINAL)."
13. DOE 1993d "Operable Unit 9, Site Scoping Report: Vol. 3 - Radiological Site Survey (FINAL)."
14. DOE 1991b "Main Hill Seeps, Operable Unit 2, On-Scene Coordinator Report for CERCLA Section 104 Remedial Action, West Powerhouse PCB Site."
15. Halford 1990 "Results of South Pond Sampling."
16. DOE 1993e "Operable Unit 4, Special Canal Sampling Report, Miami Erie Canal."
17. DOE 1990 "Preliminary Results of Reconnaissance Magnetic Survey of Mound Plant Areas 2, 6, 7, and C."
18. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (FINAL)."
19. Rogers 1975 "Mound Laboratory Environmental Plutonium Study, 1974."
20. DOE 1992h "Ground Water and Seep Water Quality Data Report Through First Quarter, FY92."
21. Dames and Moore 1976a, b "Potable Water Standards Project Mound Laboratory" and "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory."
22. DOE 1992l "Closure Report, Building 34 - Aviation Fuel Storage Tank."
23. DOE 1992j "Closure Report, Building 51 - Waste Storage Tank."
24. DOE 1994 "Operable Unit 1, Remedial Investigation Report."
25. EG&G 1994 "Active Underground Storage Tank Plan."

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9, SITE SCOPING REPORT:
VOLUME 3 - RADIOLOGICAL SITE SURVEY

MOUND PLANT
MIAMISBURG, OHIO

June 1993

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
			2444	08-83	126	0.62	b					
			2446	08-83	162	0.66[c]	30.42[c]		LDL	LDL	1	LDL
			2447	08-83	180	3.09	14.58		LDL	LDL	0.9	LDL
			2448	08-83	198	2.60	10.32		LDL	LDL	0.7	LDL
			2449	08-83	216	2.42	b					
			2450	08-83	234	1.70	5.07					
S0640	3225	2895	2925	10-83	0	1.56	b	1.53				
S0641	3250	2770	2926	10-83	0	0.12	b	2.17				
S0642	3240	2795	6793	08-84	0	0.44	b					
S0643	3275	2645	2927	10-83	0	0.82	b					
S0644	3275	2970	6558	08-84	0	NR	NR		LDL[e]	29[e]	1.2[e]	LDL[e]
S0645	3290	2990	9789	06-85	0	NR	NR			28[e]		
S0646	3290	2995	9788	06-85	0	NR	NR			0.5[e]		
C0161	3300	2240	8266	10-84	72	0.04	b					
			8267	10-84	108	0.01	b					
S0647	3340	2610	2778	10-83	0	NR	NR		LDL	270	1.3	LDL
(A hand-written note was included below this sample result stating that this sample was not included in the original Site Survey Project report because the location was cleaned up immediately.												
S0648	3350	2340	5818	07-84	0	0.32	b					
S0649	3350	2390	2833	10-83	0	1.11	2.08					
S0650	2400	2565	2832	10-83	0	1.29	b					
S0651	3450	2290	5817	07-84	0	1.48	b					
S0652	3550	2265	2829	10-83	0	8.56[c]	2.37[c]	4.02				

GAMMA SPECTROSCOPY

Document Control No._____

Environmental Restoration Program

OPERABLE UNIT 5
OPERATIONAL AREA PHASE I INVESTIGATION
NON-AOC FIELD REPORT

MOUND PLANT
MIAMISBURG, OHIO

VOLUME II - APPENDICES A-G

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

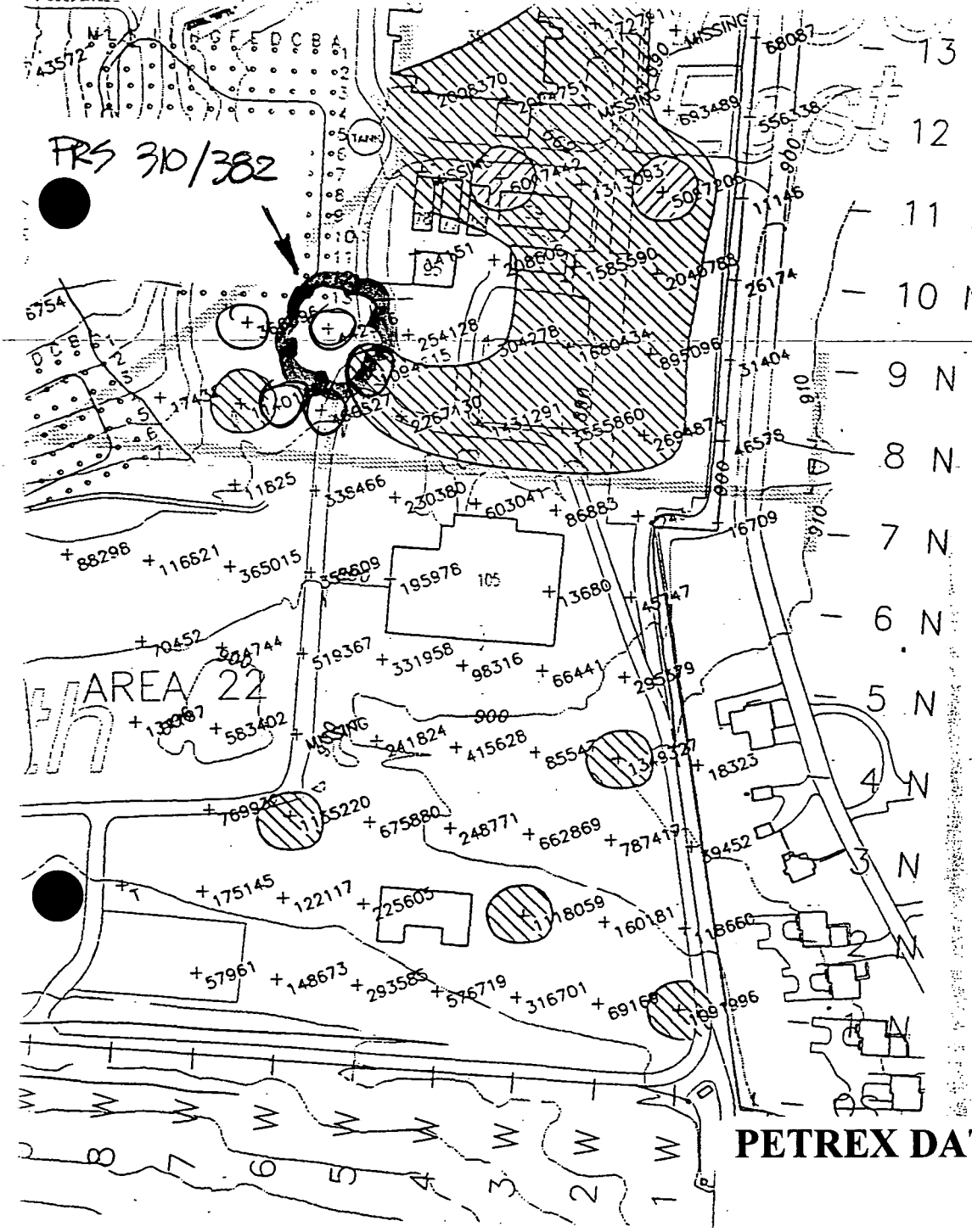
MOUND SOIL SCREEN DATA

APPENDIX D

RADIOLOGICAL DATA (FIDLER SURVEY MOUND SOIL SCREENING FACILITY DATA) FOR NON-AOC POINTS

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
08N05	130	90	6.5	4.0	NC	WIPE	c	WIPE	c
08N06	122.2	70	5.59	4.0	NC	2	a	0.2	a
08N07	122.2	110	5.59	8.5	NC	7	a	0.6	a
08N08	122.2	115	5.59	7.5	NC	23	a	0.9	a
08N11	213.2	160	13.13	10.0	NC	17	a	1.1	a
08N12	213.2	160	13.13	10.5	NC	16	a	0.9	a
08N13	213.2	120	13.13	9.0	NC	22	a	0.7	a
08N14	213.2	120	13.13	6.5	NC	10	a	0.9	a
08N15	213.2	115	13.13	8.0	NC	4	a	0.4	a
08N16	130	120	6.5	6.0	NC	0	a	0	a
08N17	130	50	6.5	6.0	NC	5	a	0.7	a
08N18	130	50	6.5	3.0	NC	11	a	0	a
08N19	130	50	6.5	4.0	NC	0	a	0	a
08N20	130	65	6.5	5.5	NC	WIPE	c	WIPE	c
08N21	157.3	60	8.45	3.0	NC	WIPE	c	WIPE	c
08N22	117.0	60	8.71	4.5	NC	22	a	0.8	a
08N23	117.0	80	8.71	7.0	NC	WIPE	c	WIPE	c
08N24	157.3	110	8.45	7.0	NC	0	a	0.6	a
						10	a	0.5	a
08N25	157.3	55	8.45	3.5	NC	24	a	0.8	a
						12	a	0.9	a

NC - No sample collected because location not an original grid point
NA - Reading not taken; contamination criteria not exceeded.
NS - Sample collected but not analyzed.
a - Mound Soil Screening Facility detection level not exceeded.
c - Results of the wipe sample were less than 20 disintegrations per minute.
CPM - Counts per minute
KCPM - Counts per minute x 1000
pCi/g - Picocuires per gram



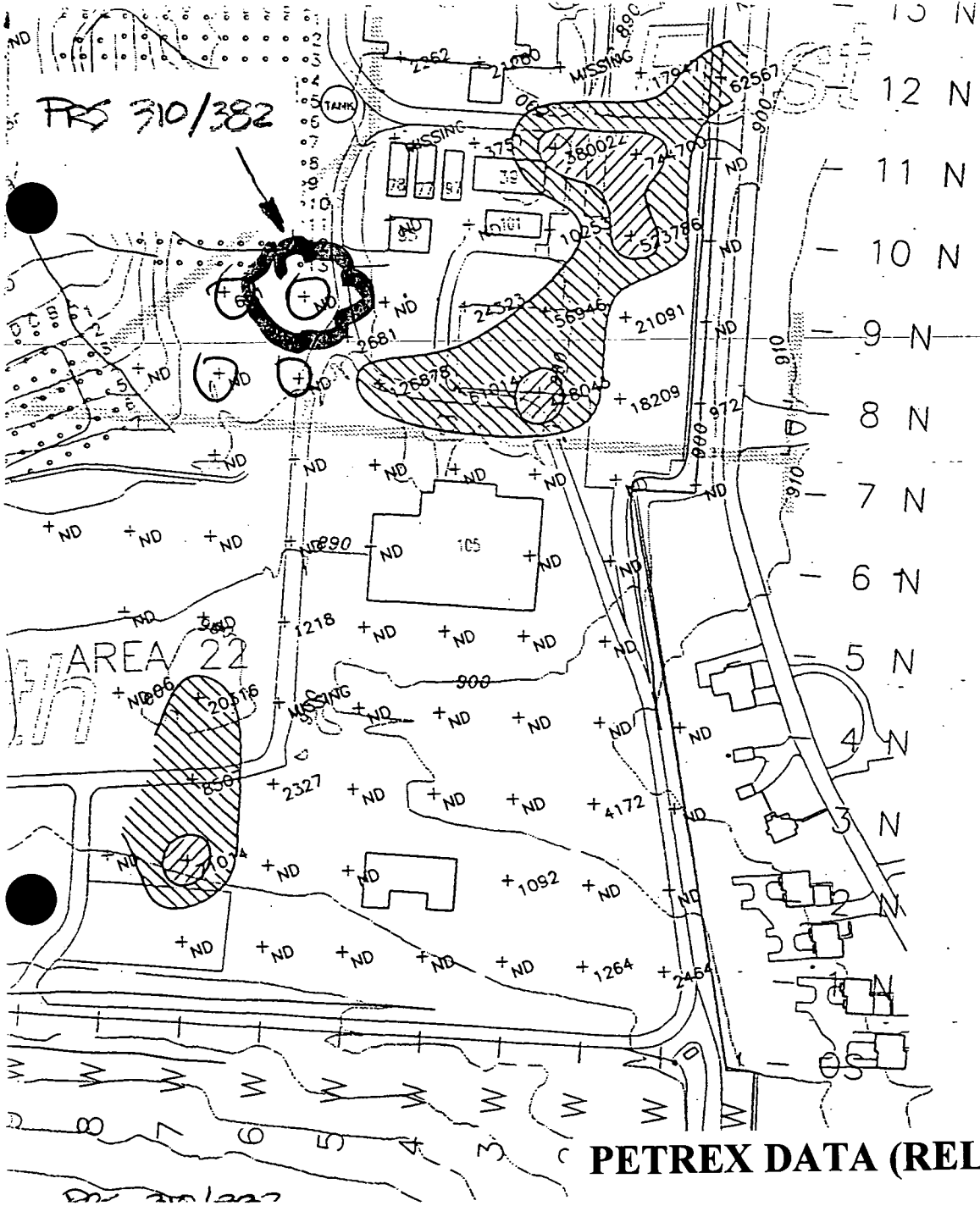
PETREX DATA (RELATIVE)

LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 4,200,000	≥ 20,000,000	≥ 5,000,000	≥ 10,000,000	≥ 5,800,000
850,000–4,199,999	2,600,000–19,999,999	850,000–4,999,999	1,500,000–9,999,999	1,400,000–5,799,999

Relative Response

Total Aromatic Hydrocarbons

Plate 2



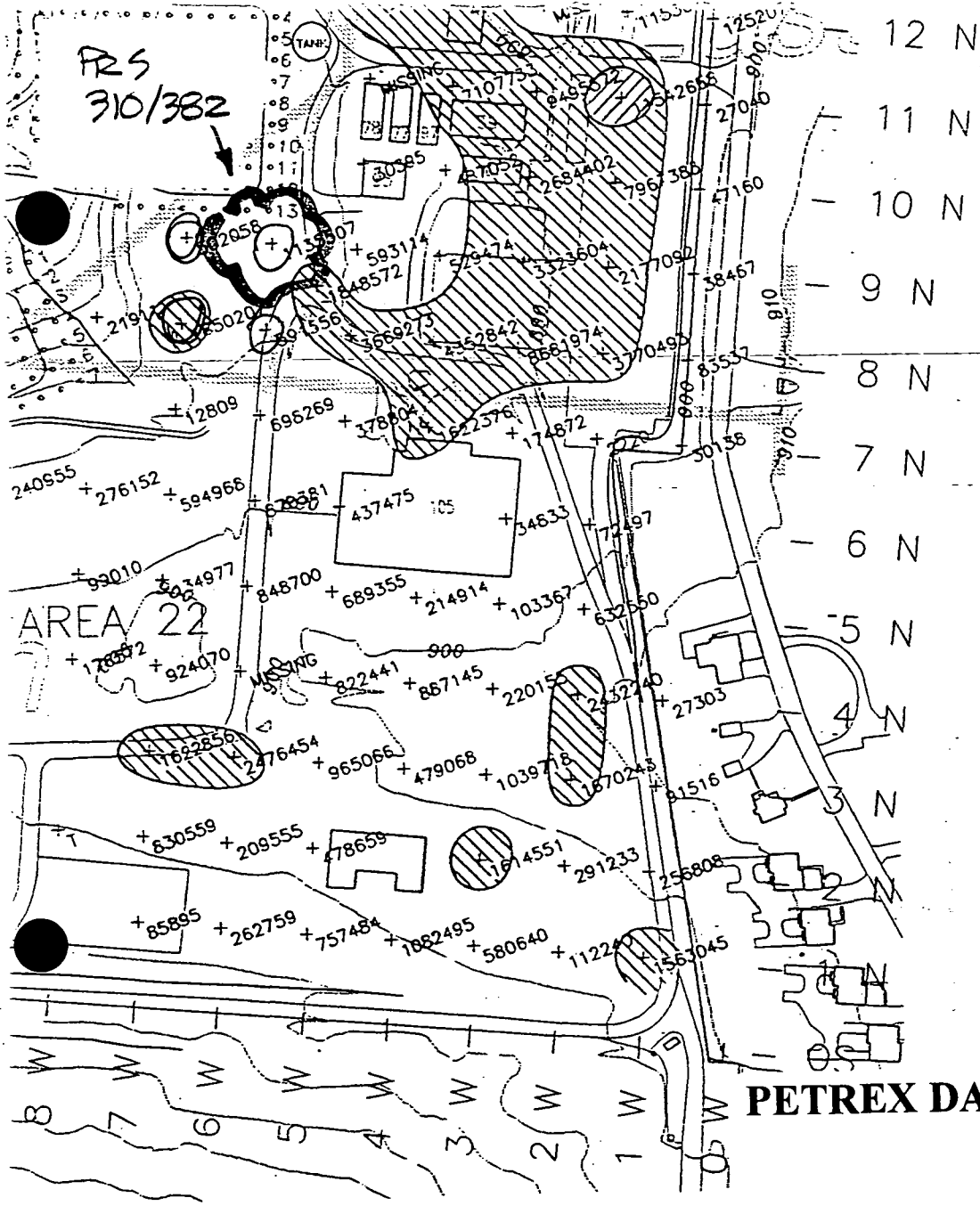
PETREX DATA (RELATIVE)

LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 70,000	≥ 1,000,000	≥ 300,000	≥ 800,000	≥ 1,400,000
7,000–69,999	100,000–999,999	30,000–299,999	80,000–799,999	180,000–1,399,999

Relative Response

Total Semivolatile Hydrocarbons

Plate 3



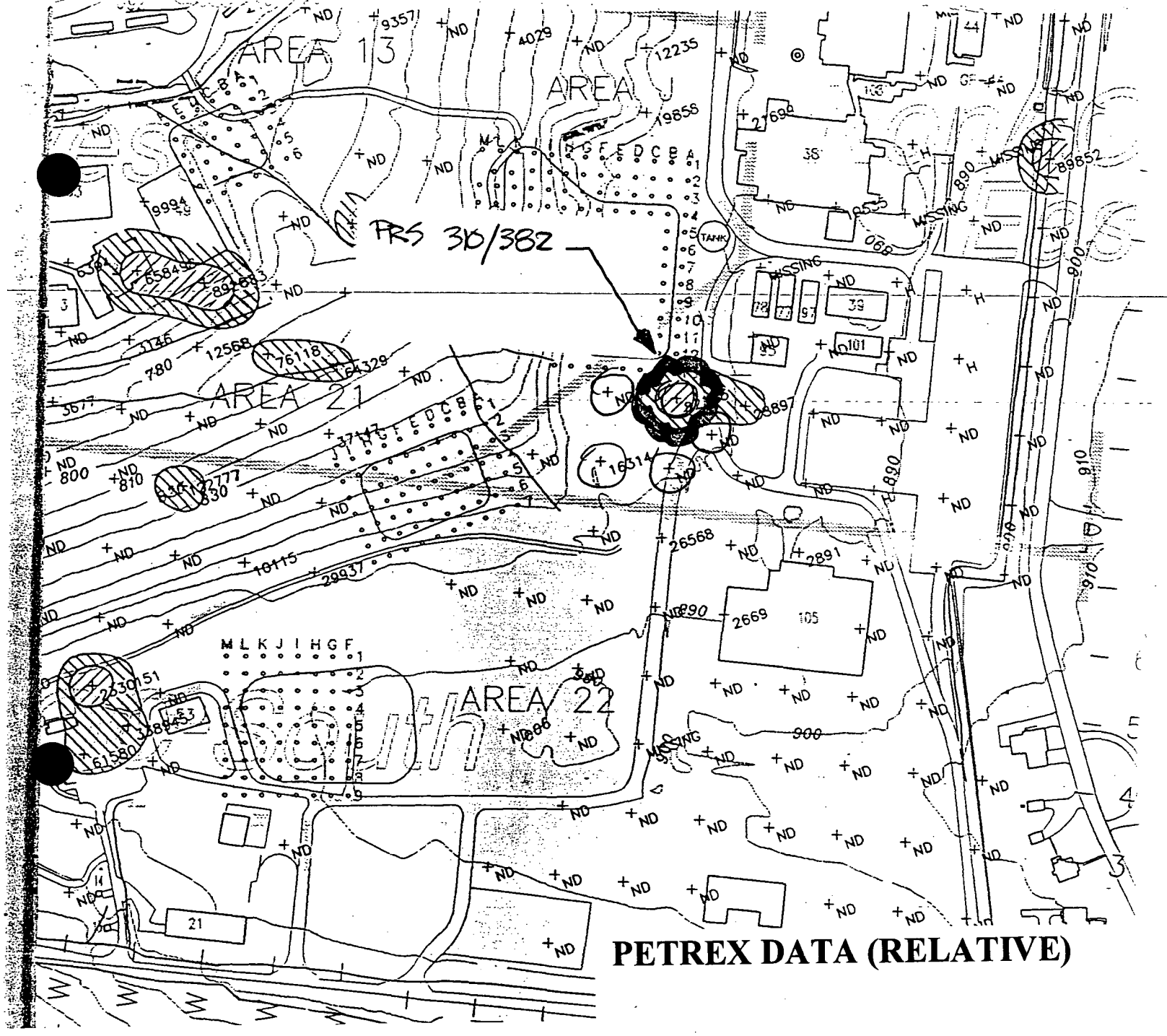
PETREX DATA (RELATIVE)

LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 8,000,000	≥ 29,000,000	≥ 11,500,000	≥ 23,000,000	≥ 25,000,000
1,500,000–7,999,999	3,000,000–28,999,999	1,600,000–11,499,999	4,000,000–22,999,999	3,000,000–24,999,999

Relative Response

Total C5–C11 Petroleum Hydrocarbons

Plate 4



LEGEND				
Relative Response Values (in ion counts):				
NonAOC–South	NonAOC–West	NonAOC–East	NonAOC–North	Area 61
≥ 500,000	≥ 500,000	≥ 80,000	≥ 400,000	≥ 250,000
50,000–499,999	50,000–499,999	20,000–79,999	40,000–399,999	35,000–249,999

Relative Response

Total Halogenated Hydrocarbons

Plate 5

DRAFT
OTHER SOILS CHARACTERIZATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

JANUARY 1996

U.S. DEPARTMENT OF ENERGY
OHIO FIELD OFFICE

DECONTAMINATION AND DECOMMISSIONING PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

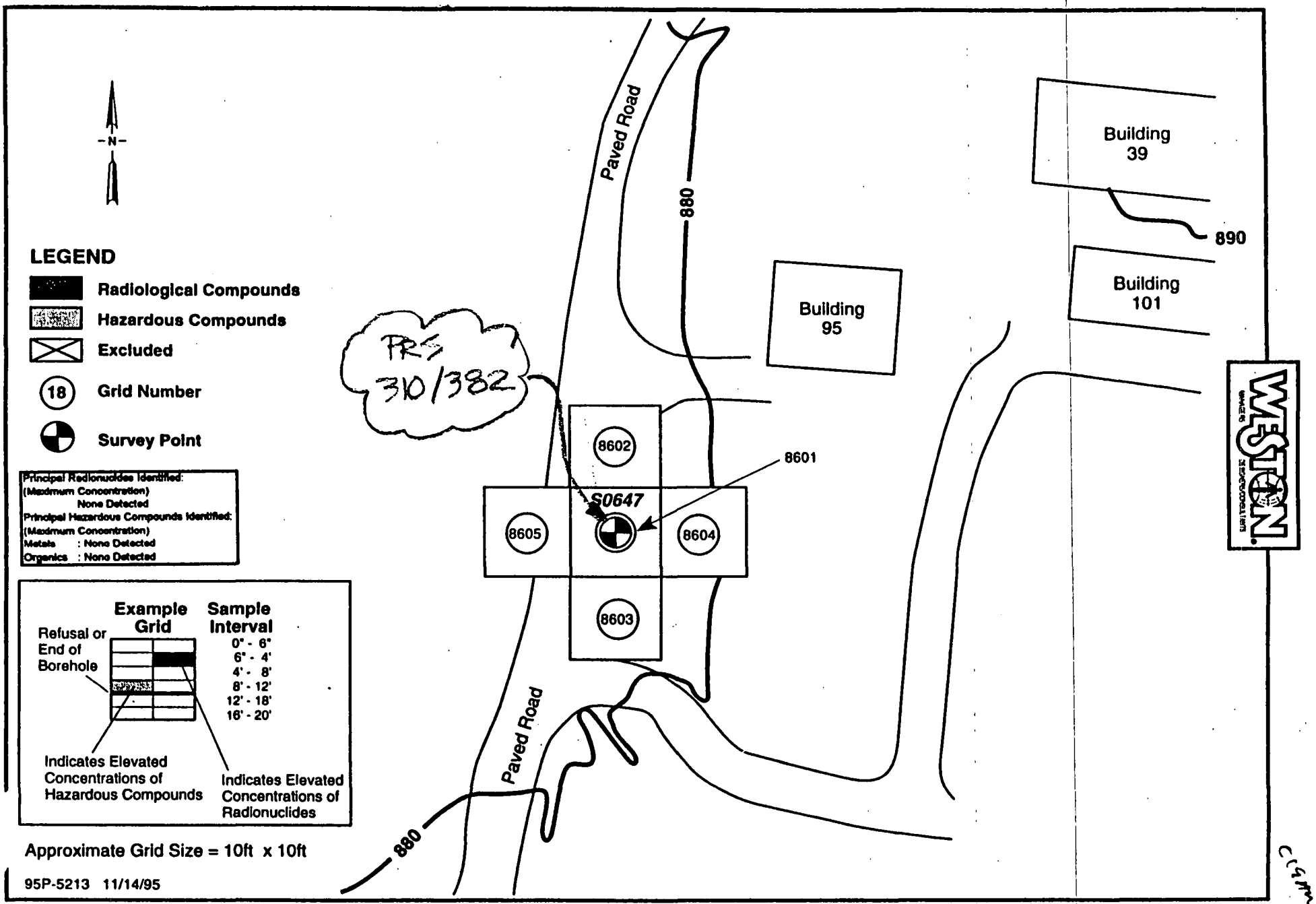


FIGURE 5.17 HOT SPOT S0647

Table 6.13 Area 85 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
85 SO175	A	HAZ	Cr	200ft²	0'-0.5'	NA	NA			
			Cr		4'-8'					

Table 6.14 Area 86 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
86 SO647	NA	None Detected		NA	NA	NA	NA			

This table lists only those samples whose reported concentrations exceeded the Other Soils field action levels.

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
87 CO028	A	RAD/HAZ	Pu	100	0.5'-8'	30	96	106.3	106.3	106.3
	B	HAZ	Cr	100	0.5'-8'	NA	NA			
	C	HAZ	As, Cr	100	0'-[illegible]	NA	NA			
	D	RAD	Pu	100	0'-0.5'	1.9	1.9	35	35	35
	E	HAZ	Cr	100	0'-0.5'	NA	NA			

Table 6.16 Area 90 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
90 SO307	NA	None Detected		NA	NA	NA	NA			

Table 6.17 Area 91 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
91 SO472	A	RAD	Pu	200	12'-16'	29.6	555	118.5	120.9	119.7
	B	RAD	Pu	100	0'-0.5'	1.9	1.9	124.5	124.5	124.5
	C	HAZ	Cr	100	0'-0.5'	NA	NA			

exceeding the action levels are tabulated below. These tables identify samples from of potential contamination. Graphic representations of the Other Soils areas and Hot Spots with a data overlay have been included to facilitate interpretation, and aid in the computation of soil cleanup volumes.

Where Mound Rad Lab method detection limits exceed specified action levels, a symbol indicating the undetermined nature of the data ("U") accompanies the spreadsheet entry.

Table 5.2 shows the action levels used in the Other Soils Field Program to identify potentially contaminated soil.

Table 5.2 Field Action Levels

Field Instruments	Action Level
FIDLER	
Channel 1 (Pu)	1000 cpm Above Background
Channel 2 (Th)	5000 cpm Above Background
OVA	1 Meter Unit Above Background
OVM	1 Meter Unit Above Background
PXRF	
Arsenic	102.07 mg/Kg
Barium	1489 mg/Kg
Cadmium	NA
Chromium (High)	NA
Chromium (Low)	164.43 mg/Kg
Lead	172 mg/Kg
Mercury	NA
Selenium	NA
Silver	2559 mg/Kg
Mound Rad Lab	
Plutonium 238	25 pCi/g
Thorium 232	5 pCi/g
Radium 226	5 pCi/g
Cesium 137	15 pCi/g *
Americium 241	20 pCi/g

* NRC Limit

The action level for Cesium 137 was reduced for this report from the D&D action level of 80 pCi/g to the NRC action level of 15 pCi/g. The basis for adjusting this limit can be found in a communication with the Nuclear Regulatory Commission (NRC) which discusses decommissioning criteria and maximum acceptable isotope concentrations in soil. A copy of the communiqué may be found in Appendix H.

Area 5

Thirteen samples in Area 5 triggered field screening action levels:

OTHER SOILS
FIELD SAMPLING DATA

Key to interpreting sample data:

Sample nomenclature is of the form **XXYY-ZZ00**

Where:
XX = Area designation

YY = Sample Location
- 01 = Historical Hot Spot Location
- 02 = Approx 10 feet north of historical location
- 03 = Approx 10 feet south of historical location
- 04 = Approx 10 feet west of historical location
- 05 = Approx 10 feet east of historical location

ZZ = Sample Type
- 50 = Soil

00 = Sample Depth
- 01 = Surface
- 04 = 0-4 feet
- 08 = 4-8 feet
- 12 = 8-12 feet

WESTON

SHEET ____ of ____

CLIENT/SUBJECT S0647 86XX W.O. NO. ____

TASK DESCRIPTION ____ TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

Sample ID	Rad Laboratory (25) Plutonium	(51) Thorium	Fidler (1K) channel 1	(5K) Channel 2	α	β	Organics OVA	OVM	Metals
8601-5003	—	—	—	—	—	—	—	—	
8602-5003	U	—	—	—	—	—	—	—	
8603-5003	U	—	—	—	—	—	—	—	
8604-5003	U	—	—	—	—	—	—	—	
8605-5003	U	—	—	—	—	—	—	—	

OTHER SOILS FIELD SAMPLING DATA

Blank entry	Sample results not currently available.
U	Sample resolution undistinguishable from preset Field Action Levels.
-	Sample results less than preset Field Action Levels.

No.

Health Physics Counting Laboratories
Request for Analysis and Health Physics Data Sheet
G Area Specific

1 of 1

To be filled out by Submitter

Nam[redacted]	HP #: 18701	RWP #: N/A
Isotope:	Analy[redacted]	

FIDLER DATA

Type of Sample: ☐ Paper Wipe ☐ Glass Fiber Filter ☒ Other: Explain Soil

Description: ☐ Air Sample ☐ Perso ☐ Structural Sample ☒ Other: Explain Soil ☐ Equipment Sample

Time and Date Sample Was Taken: 1000 - 1500 7-17-95

Pre-screened: ☐ Yes ☐ No

No. of Samples: 9

Remarks: Weston Other Soils Project Area 86 + 94

WIPE AREA: ☐ 100 cm² ☐

Fidler Check # 3672 / 3674

Next Cal. Due 7-19-95

CHANNEL		One	Out	Two
	Bkg	110	3.5K	3K
	Pu	15K	22K	3.5K
Field Inst. Res.	Th	1.2K	35K	27K

Sample ID #	Sample Description	Alpha/Beta DPM/CPM Results	Alpha/Beta Inst. ID	Fidler/CPM One	Fidler/CPM Out	Fidler/CPM Two	PAC DPM/100 CM² # 5301	PAC DPM/100 CM² / 5325		
Background	Background						Nickel	8-10-95		
	Check Standard						1005	5587K		
	Background Check Area 86			100	8K	7K	N/A	N/A		
	Pre-Scan Hole # 8604			ND	ND	ND	N/A	N/A		
	SS# 8604 - 5003			ND	ND	ND	ND	ND		
	Pre-Scan Hole # 8601			ND	ND	ND	N/A	N/A		
	SS# 8601 - 5003			ND	ND	ND	ND	ND		
	Pre-Scan Hole # 8602			ND	ND	ND	N/A	N/A		
	SS# 8602 - 5003			ND	ND	ND	ND	ND		
	Pre-Scan Hole # 8605			ND	ND	ND	N/A	N/A		
	SS# 8605 - 5003			ND	ND	ND	ND	ND		
	Pre-Scan Hole # 8603			ND	ND	ND	N/A	N/A		
	SS# 8603 - 5003			ND	ND	ND	ND	ND		
	Personnel Scan: Tim Gray			N/A	N/A	N/A	ND	ND		
	Scott Pitner			N/A	N/A	N/A	ND	ND		
	W. McDonald			N/A	N/A	N/A	ND	ND		
	Andy Sperry			N/A	N/A	N/A	ND	ND		
	Background Check Area 94			16K	9K	8K	N/A	N/A		
	Pre-Scan Hole # 9404			ND	ND	ND	N/A	N/A		
	SS# 9404 - 5001			ND	ND	ND	ND	ND		
	5004			ND	ND	ND	ND	ND		
	5008			ND	ND	ND	ND	ND		
	5009			ND	ND	ND	ND	ND		
	Personnel Scan: Scott Pitner			N/A	N/A	N/A	ND	ND		
	Andy Sperry			N/A	N/A	N/A	ND	ND		
	W. McDonald			N/A	N/A	N/A	ND	ND		

506 97

Counting Facility Technician's Signature: _____ **HP #** _____

Radiological Control Technician's Signature: _____ **HP #** _____

Date Submitted: _____ **Date Completed:** _____

Reviewed By: _____ **HP #** _____ **Date:** ___

ML-9380 (6-94) G AREA SPECIFIC

RISK-BASED GUIDELINE VALUES

MOUND PLANT
MIAMISBURG, OHIO

December 1995

Submitted to the
Office of Southwestern Area Programs (EM-453)
Environmental Restoration
and the
Miamisburg Area Office
U.S. DEPARTMENT OF ENERGY

Prepared by
HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
Environmental Management and Enrichment Facilities
Managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

FINAL
(REVISION 0)

TABLE 4A

Construction/Mound Employee - Soil/Sediment Guideline Values: Chemicals (Units = mg/kg)

CHEMICAL	Ingestion				Inhalation				Ingestion + Inhalation			
	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1
High Explosives												
HMX				5.50e+04								
PETN												
RDX	2.70e+03	2.70e+02	2.70e+01	3.20e+03								
Inorganics												
Aluminum												
Antimony				4.25e+02								
Arsenic				3.20e+02	6.00e+05	6.00e+04	6.00e+03					
Barium				7.50e+04				1.55e+07				7.50e+04
Beryllium	7.00e+01	7.00e+00	7.00e-01	5.50e+03	3.65e+06	3.65e+05	3.65e+04		7.00e+01	7.00e+00	7.00e-01	
Cadmium (Diet)				1.05e+03	5.00e+06	5.00e+05	5.00e+04					
Chromium III				1.05e+06								
Chromium VI				5.50e+03	7.50e+05	7.50e+04	7.50e+03					
Cobalt												
Copper												

TABLE 4A

Construction/Mound Employee - Soil/Sediment Guideline Values: Chemicals (Units = mg/kg)

CHEMICAL	Ingestion				Inhalation				Ingestion + Inhalation			
	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1
Cyanide				2.15e+04								
Iron												
Lead												
Lithium												
Manganese (Diet)				1.50e+05				1.55e+06				1.35e+05
Mercury				3.20e+02				9.50e+06				3.20e+02
Nickel				2.15e+04								
Silver				5.50e+03								
Thallium												
Vanadium				7.50e+03								
Zinc				3.20e+05								
Organics												
1,1,1-Trichloroethane												
1,1-Dichloroethane				1.05e+05				3.90e+01				3.90e+01
1,2-Dichloroethane	3.30e+03	3.30e+02	3.30e+01		1.70e+03	1.70e+02	1.70e+01		1.10e+03	1.10e+02	1.10e+01	

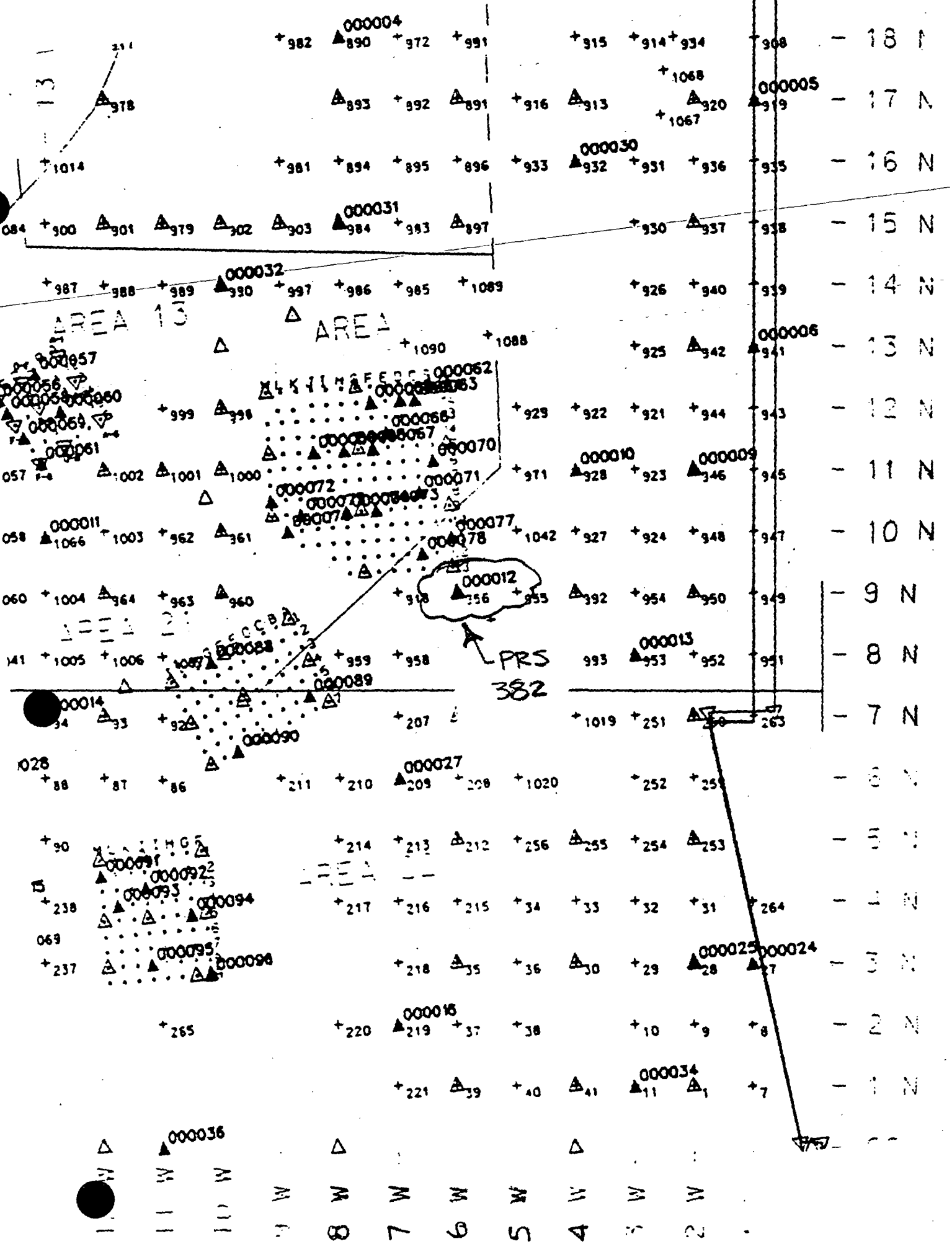
TABLE 4B Construction/Mound Employee - Soil/Sediment Guideline Values: Radionuclides (Units = pCi/g)

RADIONUCLIDE	Ingestion			External			Inhalation			Ingestion + External + Inhalation		
	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6	GV for TR=10-4	GV for TR=10-5	GV for TR=10-6
Actinium-227+D	2.65e+02	2.65e+01	2.65e+00	1.65e+02	1.65e+01	1.65e+00	2.20e+05	2.20e+04	2.20e+03	1.00 e+02	1.00 e+01	1.00 e+00
Americium-241	5.00e+02	5.00e+01	5.00e+00	2.10e+04	2.10e+03	2.10e+02	4.45e+05	4.45e+04	4.45e+03	4.45e+02	4.95e+01	4.95 e+00
Bismuth-207	3.30e+04	3.30e+03	3.30e+02	1.75e+01	1.75e+00	1.75e-01	1.80e+09	1.80e+08	1.80e+07	1.75e+01	1.75e+00	1.75 e-01
Cesium-137+D	5.50e+03	5.50e+02	5.50e+01	4.65e+01	4.65e+00	4.65e-01	9.00e+08	9.00e+07	9.00 e+06	4.60e+01	4.60e+00	4.6 e-01
Cobalt-60	9.00e+03	9.00 e+02	9.00 e+01	10.00e+00	1.00e+00	1.00e-01	2.50e+08	2.50e+07	2.50 e+06	1.00 e+01	1.00e+00	1.00 e-01
Plutonium-238	5.50e+02	5.50e+01	5.50 e+00	5.00e+06	5.00 e+05	5.00 e+04	6.50e+05	6.50 e+04	6.50 e+03	5.50e+02	5.50 e+01	5.50 e+00
Plutonium-239	5.50e+02	5.50 e+01	5.50 e+00	7.50e+06	7.50 e+05	7.50 e+04	6.00e+05	6.00 e+04	6.00 e+03	5.50 e+02	5.50 e+01	5.50 e+00
Plutonium-240	5.50e+02	5.50 e+01	5.50 e+00	5.00e+06	5.00 e+05	5.00 e+04	6.00e+05	6.00 e+04	6.00 e+03	5.50 e+02	5.50 e+01	5.50 e+00
Radium-226+D	5.50 e+02	5.50 e+01	5.50 e+00	1.45e+01	1.45e+00	1.45e-01	6.00e+06	6.00e+05	6.00 e+04	1.40e+01	1.40e+00	1.40 e-01
Strontium-90+D	3.00e+03	3.00 e+01	3.00 e+00				2.45e+08	2.45 e+07	2.45 e+06	3.00 e+02	3.00 e+01	3.00 e+00
Thorium-228+D	7.00e+02	7.00 e+01	7.00 e+00	10.00e+01	10.00 e+00	1.00e+00	1.75e+05	1.75e+04	1.75 e+03	8.50e+01	8.50 e+00	8.50 e-01
Thorium-230	4.45e+03	4.45e+02	4.45e+01	2.20e+06	2.20 e+05	2.20 e+04	10.00e+05	10.00 e+04	10.00 e+03	4.40e+03	4.40e+02	4.40 e+01
Thorium-232	5.00e+03	5.00 e+02	5.00 e+01	4.95e+06	4.95 e+05	4.95 e+04	9.00e+05	9.00 e+04	9.00 e+03	5.00e+03	5.00 e+02	5.00 e+01
Tritium	2.35e+06	2.35 e+05	2.35 e+04				1.80e+11	1.80 e+10	1.80 e+09	2.35e+06	2.35 e+05	2.35 e+04

SUPPLEMENTAL REFERENCE DATA PRS 376

SOIL GAS CONFIRMATION INVESTIGATION

SAMPLING RESULTS 3/96


AREA 13
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18 N
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14 N
13 N
12 N
11 N
10 N
9 N
8 N
7 N
3 N
2 N
1 N

Mound Environmental Restoration Program
Soil Gas Confirmation Sampling Results - Block D

Chemical Detections

ANALYTE	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)								
Aluminum	13100	8460	17700	7370	14100	20000	19000	NA
Antimony							NA	425
Arsenic	1.9 BJ	1.2 BJ	2.7	3.6 J	3.4	2.4 B	8.6	320
Barium	78.4	53.4	110	51.3 B	68.7	119	180	75,000
Beryllium	0.44	0.20 B	0.68	0.24 B	0.46	0.96	1.3	1
Bismuth					0.82 B	1.2 B	NA	NA
Cadmium	6.0	4.6	7.7	3.7	5.7	8.6	2.1	1,050
Calcium	127000 J	222000 J	94200	342000	133690	23800	310000	NA
Chromium	17.3	10.8	22.3	9.1	17.7	24.5	20	1,050,000
Cobalt	12.7 J	7.5 BJ	13.9	5.8 B	11.6 B	18.5	19	NA
Copper	21.3 J	13.5 J	22.4	12.2	19.3	26.9	26	NA
Cyanide			1.8		1.0		ND	21,500
Iron	27900	21100	36300	16600	26600	40000	35000	NA
Lead	9.3 J	29.4 J	12.9	14.3	14.1	27.5	48	NA
Lithium	25.3	17.8 B	30.7	15.0 B	25.1	34.1	26	NA
Magnesium	19900 J	7250 J	8190	4760	14600	6250	40000	NA
Manganese	658	543	939	689	641	1360	1400	135,000
Mercury						0.07 B	NC	320
Molybdenum	1.3 B	0.81 B	1.3 B	0.51 B	1.3 B	0.76 B	27	NA
Nickel	26.4	17.6	31.4	13.8	23.9	34.4	32	21,500
Potassium	1630	1100 B	2250 B	1010 B	2090 B	3680	1900	NA
Sodium	2490 J	328 BJ	142 B	248 B	398 B	209 B	240	NA
Tin	1.6 B	1.1 B	0.98 B		1.7 B	3.3 B	20	NA
Vanadium	22.4	12.9	29.4	10.7	23.8	30.2	25	7,500
Zinc	68.5	44.9	92.5	67.7	70.5	103	140	320,000

J - Numerical value is an estimated quantity
NA - Background value not available

PRS 382

NOTE: No entry equates to a non-detect.

Mound Environmental Restoration Program
Soil Gas Confirmation Sampling Results - Block D

Chemical Detections

ANALYTE	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	Background	10^{-6} Construction Worker Guidelines
SEMI-VOLATILES (µg/kg)								
Acenaphthene							NA	NA
Anthracene							NA	320,000,000
Benzo(a)anthracene	18 J				47 J		NA	4,100
Benzo(a)pyrene	21 J				42 J		NA	410
Benzo(b)fluoranthene	22 J				39 J		NA	4,100
Benzo(g,h,i)perylene					33 J		NA	NA
Benzo(k)fluoranthene	17 J				46 J		NA	41,000
Bis(2-ethylhexyl)phthalate	35 J				100 J		NA	215,000
Carbazole							NA	NA
Chrysene	22 J				51 J		NA	410,000
Di-n-butyl phthalate							NA	105,000,000
Di-n-octyl phthalate							NA	21,500,000
Dibenz(a,h)anthracene							NA	410
Dibenzofuran							NA	NA
Diethyl phthalate							NA	NA
Fluoranthene	38 J				100 J	28 J	NA	42,500,000
Fluorene							NA	NA
Indeno(1,2,3-cd)pyrene					27 J		NA	4,100
Naphthalene				61 J			NA	NA
Phenanthrene					63 J		NA	NA
Pyrene	37 J				87 J	26 J	NA	32,000,000

J - Numerical value is an estimated quantity
NA - Background value not available

PRS 382

NOTE: No entry equates to a non-detect.

Mound Environmental Restoration Program
Soil Gas Confirmation Sampling Results - Block D

Chemical Detections

ANALYTE	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids	84.7	81.7	80.9	74.0	85.3	72.8	---	---
Nitrate-Nitrite (mg-N/kg)	1.8	2.1	4.9	3.0	2.4	6.4	26	NA
VOLATILES (µg/kg)								
1,2-Dichloroethene (total)				96			NA	NA
2-Butanone	8 J	10 J					NA	46,500,000
Benzene				2 J			NA	32,000
Carbon Disulfide		4 J					NA	1,400,000
Ethylbenzene				1 J			NA	2,400
Toluene				28			NA	1,250,000
Trichloroethene				3 J			NA	125,000
Xylene (total)			1 J	4 J			---	

J - Numerical value is an estimated quantity

PRS 382

NOTE: No entry equates to a non-detect.

Mound Environmental Restoration Program
Soil Gas Confirmation Sampling Results - Block D

Chemical Detections

ANALYTE	SGC NAC 000012	SGC NAC 000013	SGC NAC 000016	SGC NAC 000024	SGC NAC 000025	SGC NAC 000027	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)								
Americium-241 (AM-241)	0.3033	0.211	1.16	0.273	0.6393	0.384	ND	5.0
Bismuth-207 (BI-207)	0.093	0.06274	0.116	0.1	0.124	0.101	ND	0.18
Bismuth-210 (BI-210M)	0.135	0.0902	0.1614	0.1055	0.1519	0.141	ND	NA
Cesium-137 (CE-137DA)	0.117	0.0946	0.199	0.383	0.185	0.169	0.42	0.46
Cobalt-60 (CO-60)	0.128	0.1158	0.149	0.1488	0.192	0.182	NC	0.10
Plutonium-238 (PU-238)	0.101	0.0107	0.253	0.523	0.288	0.259	0.13	5.5
Plutonium-239/240 (PU-239/4(	0.00154	0.00304	0.00413	0.0141	0.00665	0.00381	0.18	5.5
Potassium-40 (K-40)	15.5	4.65	15.2	12	18.1	21.7	37	NA
Radium-226 (RA-226DA)	0.592	0.289	0.934	0.714	1.22	1.5	2	0.14
Thorium-228 (TH-228)	0.697	0.247	1.04	0.775	1.16	0.986	1.5	0.85
Thorium-230 (TH-230)	0.803	0.359	1.36	0.988	1.49	1.57	1.9	44
Thorium-232 (TH-232)	0.769	0.21	0.893	0.938	1	0.915	1.4	50
Uranium-234 (U-234)	0.693	0.378	0.765	0.718	1.07	1.07	1.1	38
Uranium-235 (U-235)	0.0231	0.0188	0.0394	0.0276	0.0467	0.0592	0.11	3.4
Uranium-238 (U-238)	0.681	0.424	0.993	0.839	1.14	0.869	1.2	11

NA - Background value not available
ND - No detections in background samples
NC - Background value not computed

PRS 382

NOTE: No entry equates to a non-detect.

SOIL SCREENING LEVEL CALCULATIONS

SOIL SCREENING LEVEL CALCULATIONS

Soil concentrations that pose no calculated threat to groundwater

REFERENCES

Schairbaum, J.R. and Frost, J.P. 1988. "The Hydrology of Sicamore Farm - A Preliminary Report." Center for Ground water Management, Wright State University. September 20, 1988.

DOE. 1994. "Operable Unit 9, Hydrogeologic Investigation: Bedrock Report." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. January, 1994.

USEPA. 1994. "Technical Background Document for soil Screening Guidance - Review Draft." U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA/540/R-94/106 December, 1994

Soil Screening Level (10m source, 0.01 hydraulic gradient, 500m from receptor)

A Soil Screening Level (SSL) is the level of contamination that can exist in soil that does not adversely affect the quality of groundwater at a potential drinking water source such as the Buried Valley Aquifer (BVA).

Soil Screening Calculations are used to determine if a PRS may adversely affect ground water quality due to leaching of organic soil contaminants. These equations conservatively calculate the effects of soil leaching and ground water mixing at a particular PRS. The input parameters represent conditions at the PRS. MCLs are assumed to be protective of ground water that will be used as a drinking water source. Note that the distance a PRS lies from a potential drinking water receptor (BVA) generally controls the amount of ground water mixing.

NOTE: Once the equation calculates a mixing zone depth (d) that is equal to the aquifer thickness (da), no additional mixing or dilution takes place. This is the maximum attentuation that the Soil Screening Level Equation calculates. All distances to a potential receptor greater than the distance that first causes the mixing zone depth to equal the aquifer thickness creates no additional attenuation. For this reason, the tables are only reproduced until (d) is equal to the aquifer thickness, which in the case of the Mound Plant Bedrock is 15 m.

Parameters for soil leaching calculation:			
Definition	**Parameter**	**Main Hilltop soil**	**Units**
source length parallel to ground water flow	**L**	**10**	**m**
aquifer thickness (DOE 1994)	da	15	m
hydraulic conductivity (DOE 1994)	K	52	m/y
hydraulic gradient at the source	**i**	**0.01**	**m/m**
horizontal distance to receptor	**xr**	**500**	**m**
infiltration rate (Schairbaum & Frost 1988)	in	0.15	m/y
soil-water partition coefficient (Koc * foc for organic chemicals)	Kd	chemical specific	L/kg
saturated porosity	Ow	0.15	
air filled porosity	Oa	0.28	
Henry's Law constant * 41 (0 for metals and radionuclides)	H	chemical specific	
dry soil bulk density	B	1.6	kg/L
soil organic carbon/water partition coefficient	Koc	chemical specific	L/kg
fraction organic carbon in soil (DOE Mound Plant Data Base)	foc	0.02	
mixing zone depth	d	15	m
dilution factor (used to multiply the target concentration)	df=	6.20	

Mixing Zone Depth Calculation

MIXING ZONE DEPTH (d)

$d = (0.0112(L+xr)^2)^{0.5} + da\{1 - \exp[(in(L+xr))/Kida)]\}$ (Equation 3)

DILUTION FACTOR (df) (Equation 4)

$df = 1 + Kid/inL$

SOIL SCREENING LEVEL CALCULATION

$SSL = Cw\{Kd + (Ow + (OaH))/B\}$ (Equation 1)

$Kd = Koc * foc$ (Equation 2)

INPUT PARAMETER DEFINITION

MCL	mg/L	
Cw	mg/L	target soil leachate. Acceptable water conc. * df
Kd	L/kg	soil-water partition coefficient
Ow		saturated porosity
Oa		air filled porosity
H		Henry's Law constant * 41 to make dimensionless
B	kg/L	dry soil bulk density
Koc	L/kg	soil organic carbon/water partition coefficient
foc	g/g	fraction organic carbon in soil

CHEMICAL NAME	H	Koc	foc	Kd	MCL	10-5 GV	Acceptable	Cw	SSL
		L/kg		L/kg	mg/L	mg/L	Concentration	mg/L	mg/kg
Acenapthene	7.54E-03	5846	0.02	116.92			0	0.00	—
Acetone	1.18E-03	0.46	0.02	0.0092		3.6	3.6	22.32	**2.30**
Aldrin	4.22E-03	94623	0.02	1892.46			0	0.00	—
Anthracene	4.55E-03	18162	0.02	363.24	0.007		0.007	0.04	**15.77**
Arochlor 1016		147410	0.02	2948.2			0	0.00	—
Arochlor 1254		892520	0.02	17850.4		0.00073	0.00073	0.00	**80.79**
Arochlor 1260		4425557	0.02	88511.14		0.000011	0.000011	0.00	**6.04**
Benzene	2.24E-01	66	0.02	1.32	0.005		0.005	0.03	**0.05**
Benzo(a)anthracene	1.48E-04	272847	0.02	5456.94	0.007		0.007	0.04	**236.84**
Benzo(b)flouranthene	2.53E-04	882588	0.02	17651.76	0.007		0.007	0.04	**766.09**
Benzoic Acid	1.37E-05		0.02			140	140	868.00	**81.38**
Benzo(a)pyrene	3.43E-05	749569	0.02	14991.38	0.0002		0.0002	0.00	**18.59**
Bis(2-chlorethyl)ether	8.77E-04	76	0.02	1.52			0	0.00	—
Bis(2-ethylhexyl)phthalate	3.43E-04	94361	0.02	1887.22			0	0.00	—
Bomodichloromethane	1.30E-01	54	0.02	1.08	0.08		0.08	0.50	**0.59**
Bromoform	2.52E-02	97	0.02	1.94	0.08		0.08	0.50	**1.01**
Butanol	3.50E-04	5	0.02	0.1			0	0.00	—
Butyl benzyl phthalate	7.83E-05	15975	0.02	319.5		7.3	7.3	45.26	**14464.81**
Carbazole	8.12E-05	2441	0.02	48.82			0	0.00	—
Carbon disulfide	5.21E-01	52	0.02	1.04		0.033	0.033	0.20	**0.25**
Carbon tetrachloride	1.18E+00	187	0.02	3.74	0.005		0.005	0.03	**0.13**
Chlordane	2.73E-03	61155	0.02	1223.1	0.002		0.002	0.01	**15.17**
p-Chloroaniline	4.80E-05	41	0.02	0.82			0	0.00	—
Chlorobenzene	1.79E-01	213	0.02	4.26			0	0.00	—
Chlorodibromomethane	1.02E-01	72	0.02	1.44	0.08		0.08	0.50	**0.77**
Chloroform	1.65E-01	47	0.02	0.94	0.08		0.08	0.50	**0.53**
2-Chlorphenol	6.81E-04		0.02				0	0.00	—
Chyrsene	4.96E-05	312425	0.02	6248.5		0.0046	0.0046	0.03	**178.21**
DDD	2.03E-04	84937	0.02	1698.74			0	0.00	—
DDE	5.08E-03	108469	0.02	2169.38		0.00017	0.00017	0.00	**2.29**
DDT	2.20E-03	77577	0.02	1551.54		0.001	0.001	0.01	**9.62**
Dibenzo(a,h)anthracene	4.59E-07	1914389	0.02	38287.78			0	0.00	—
Di-n-butyl phthalate	5.86E-05	16851	0.02	337.02		3	3	18.60	**6270.32**
1,2-Dichlorobenzene (o)	8.61E-02	693	0.02	13.86	0.6		0.6	3.72	**51.96**
1,2-Dichlorobenzene (p)	1.15E-01	653	0.02	13.06	0.075		0.075	0.47	**6.13**

CHEMICAL NAME	H	Koc L/kg	foc	Kd L/kg	MCL mg/L	10-6 GV mg/L	Acceptable Concentration	Cw mg/L	SSL mg/kg
3,3-Dichlorobenzidene	8.53E-07	2441	0.02	48.82			0	0.00	—
1,1-Dichloroethane	2.36E-01	35	0.02	0.7		1.1	1.1	6.82	5.70
1,2-Dichloroethane	5.25E-02	20	0.02	0.4	0.005		0.005	0.03	0.02
1,1-Dichloroethylene	1.04E+01	64	0.02	1.28	0.007		0.007	0.04	0.14
cis-1,2 Dichloroethylene	1.85E-01	29	0.02	0.58	0.07		0.07	0.43	0.31
trans-1,2-Dichloroethylene	2.29E-01	50	0.02	1	0.1		0.1	0.62	0.70
1,2-Dichloropropane	1.15E-01	59	0.02	1.18	0.005		0.005	0.03	0.04
1,3-Dichloropropene	1.21E-01	33	0.02	0.66			0	0.00	—
2.4-Dichlorophenol	9.76E-06		0.02				0	0.00	—
Dieldrin	1.09E-04	18388	0.02	367.76		0.0018	0.0018	0.01	4.11
Diethyl phthalate	2.24E-05	152	0.02	3.04			0	0.00	—
2,4-Dimethylphenol	1.33E-04		0.02				0	0.00	—
Dimethyl phthalate	2.37E-05	32	0.02	0.64			0	0.00	—
2,4-Dinitrophenol	1.98E-07		0.02				0	0.00	—
2,4-Dinotrotolulene	6.03E-06	51	0.02	1.02			0	0.00	—
2,6-Dinotrotolulene	5.33E-06	42	0.02	0.84			0	0.00	—
Di-n-octyl phthalate	3.14E-05	9.8E+08	0.02	19601631		0.73	0.73	4.53	88716980.61
Endosulfan	9.47E-04	738	0.02	14.76			0	0.00	—
Endrin	4.88E-05	9335	0.02	186.7	0.002		0.002	0.01	2.32
Ethylbenzene	3.18E-01	388	0.02	7.76	0.7		0.7	4.34	34.33
Fluoranthene	3.83E-04	72025	0.02	1440.5		0.87	0.87	5.39	7770.56
Fluorene	2.99E-03	9226	0.02	184.52			0	0.00	—
Heptachlor	2.41E-02	11651	0.02	233.02	0.0004		0.0004	0.00	0.58
Heptachlor epoxide	3.40E-04	7236	0.02	144.72	0.0002		0.0002	0.00	0.18
Hexachlorobenzene	2.19E-02	27996	0.02	559.92	0.001		0.001	0.01	3.47
Hexachloro-1,3-butadiene	9.80E-01	6992	0.02	139.84			0	0.00	—
alpha-HCH (alpha-BHC)	2.78E-04	1310	0.02	26.2			0	0.00	—
beta-HCH (beta-BHC)	1.42E-05	1392	0.02	27.84		0.000047	0.000047	0.00	0.01
gamma-HCH (lindane)	1.39E-04	1085	0.02	21.7	0.0002		0.0002	0.00	0.03
Hexachlorocyclopentadien	7.05E-01	9589	0.02	191.78	0.05		0.05	0.31	59.52
Hexachloroethane	1.48E-01	1829	0.02	36.58			0	0.00	—
Indeno(1,2,3-c,d)pyrene	1.99E-07	4364700	0.02	87294		0.000026	0.000026	0.00	14.07
Isophorone	2.54E-04	30	0.02	0.6		7.2	7.2	44.64	30.97
Mercury	4.67E-01		0.02		0.002		0.002	0.01	0.00

CHEMICAL NAME	H	Koc	foc	Kd	MCL	10-6 GV	Acceptable	Cw	SSL
		L/kg		L/kg	mg/L	mg/L	Concentration	mg/L	mg/kg
Methoxychlor	2.60E-04	77936	0.02	1558.72	0.04		0.04	0.25	386.59
Methyl bromide	5.82E-01	11	0.02	0.22			0	0.00	—
Methyl chloride	1.85E+00	7	0.02	0.14			0	0.00	—
Methylene chloride	9.72E-02	13	0.02	0.26			0	0.00	—
2-Methylphenol	6.72E-05		0.02				0	0.00	—
Napthalene	1.98E-02	1549	0.02	30.98			0	0.00	—
Nitrobenzene	8.45E-04		0.02				0	0.00	—
N-Nitrosodiphenylamine	2.86E-02	327	0.02	6.54			0	0.00	—
N-Nitrosodi-n-proplyamine	1.70E-03	17	0.02	0.34			0	0.00	—
Pentachlorobenzene		13274	0.02	265.48			0	0.00	—
Pentachlorophenol	5.82E-04		0.02		0.001		0.001	0.01	0.00
Phenol	2.44E-05		0.02			22	22	136.40	12.79
Pyrene	3.39E-04	59865	0.02	1197.3		0.68	0.68	4.22	5048.21
Styrene	1.37E-01	573	0.02	11.46	0.1		0.1	0.62	7.18
1;1,2,2-Tetrachloroethane	1.53E-02	104	0.02	2.08			0	0.00	—
Tetrachloroethylene	7.09E-01	139	0.02	2.78	0.005		0.005	0.03	0.09
Toluene	2.52E-01	171	0.02	3.42	1		1	6.20	22.06
Toxaphene	1.38E-04	501	0.02	10.02	0.003		0.003	0.02	0.19
1,2,4-Trichlorobenzene	1.07E-01	1840	0.02	36.8	0.07		0.07	0.43	16.02
1,1,1-Trichloroethane	7.63E-01	110	0.02	2.2	0.2		0.2	1.24	3.01
1,1,2-Trichloroethane	4.10E-02	61	0.02	1.22	0.005		0.005	0.03	0.04
Trichloroethylene	4.35E-01	112	0.02	2.24	0.005		0.005	0.03	0.07
2,4,5-Trichlorophenol	1.80E-04		0.02				0	0.00	—
2,4,6-Trichlorophenol	1.66E-04		0.02				0	0.00	—
Vinyl acetate	2.26E-02	5	0.02	0.1			0	0.00	—
Vinyl chloride	3.45E+00	11	0.02	0.22	0.002		0.002	0.01	0.01
Xylenes (total)	2.48E-01	381	0.02	7.62	10		10	62.00	480.94
Inorganics									
Antimony			0.02		0.006		0.006	0.04	0.00
Arsenic			0.02	29	0.05		0.05	0.31	9.02
Barium			0.02	1.4	2		2	12.40	18.52
Beryllium			0.02	4600	0.004		0.004	0.02	114.08
Bromate			0.02		0.01		0.01	0.06	0.01
Cadmium			0.02	120	0.005		0.005	0.03	3.72
Chloramine			0.02		4		4	24.80	2.33

CHEMICAL NAME	H	Koc	foc	Kd	MCL	10-6 GV	Acceptable	Cw	SSL
		L/kg		L/kg	mg/L	mg/L	Concentration	mg/L	mg/kg
Chlorine			0.02		4		4	24.80	2.33
Chlorine Dioxide			0.02		0.8		0.8	4.96	0.47
Chromium (total)			0.02	19	0.1		0.1	0.62	11.84
Copper			0.02	10000					
Cyanide			0.02		0.2		0.2	1.24	0.12
Fluoride			0.02		4		4	24.80	2.33
Mercury			0.02	145	0.002		0.002	0.01	1.80
Nickel			0.02	21	0.1		0.1	0.62	13.08
Nitrate			0.02		10		10	62.00	5.81
Nitrite			0.02		1		1	6.20	0.58
Selenium			0.02	5	0.05		0.05	0.31	1.58
Sulfate			0.02		500		500	3100.00	290.63
Zinc			0.02	420					
Thallium			0.02	71	0.002		0.002	0.01	0.88
Radionuclides					pCi/L	pCi/L	pCi/L		—
Radium 226					20		20	124.00	11.63
Radon					300		300	1860.00	174.38
Tritium				1	20,000		20000	124000.00	135625.00
Actinium 227						0.076	0.076	0.47	0.04
Americium 241						0.15	0.15	0.93	0.09
Bismuth 207						9.4	9.4	58.28	5.46
Cesium 137						1.5	1.5	9.30	0.87
Cobalt 60						2.5	2.5	15.50	1.45
Plutonium 238				100000		0.16	0.16	0.99	99200.09
Plutonium 239				100000		0.15	0.15	0.93	93000.09
Plutonium 240				100000		0.15	0.15	0.93	93000.09
Strontium 90						0.85	0.85	5.27	0.49
Thorium 228						0.21	0.21	1.30	0.12
Thorium 230						1.3	1.3	8.06	0.76
Thorium 232						1.5	1.5	9.30	0.87