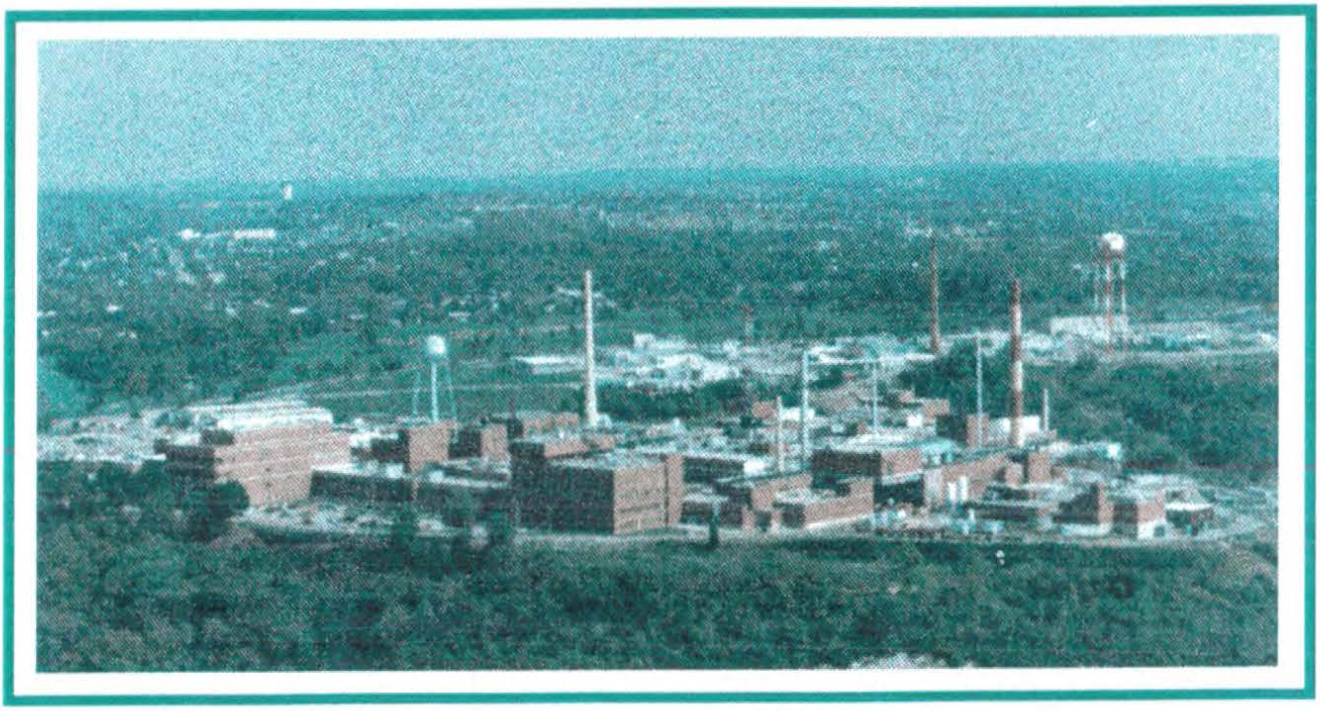
EG&G MOUND-30-03-03-03--9706180003

MOUND

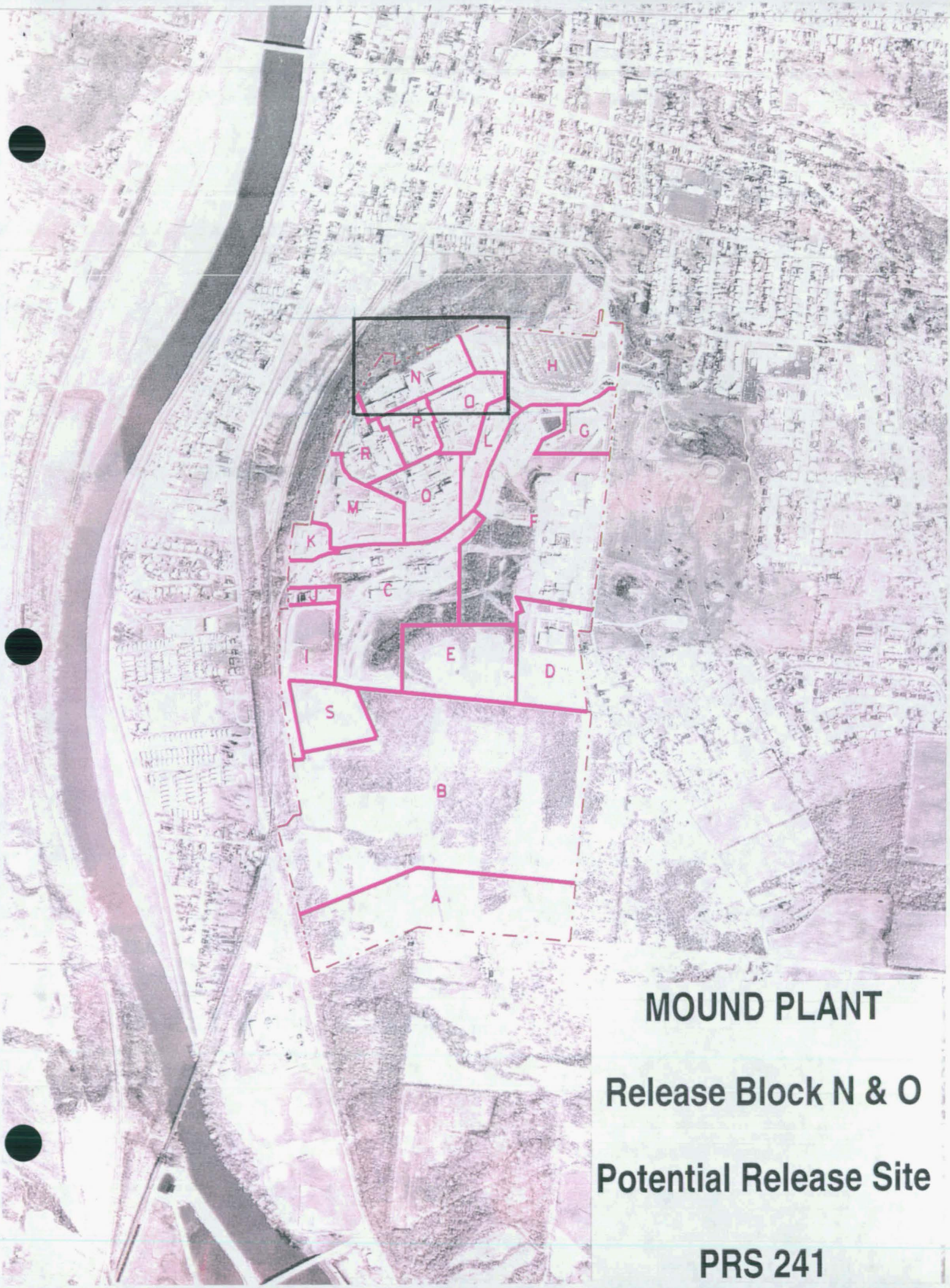
Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 241



PRS 241

REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comments.	May 21, 1997
FINAL 1		



MOUND PLANT

Release Block N & O

Potential Release Site

PRS 241

241
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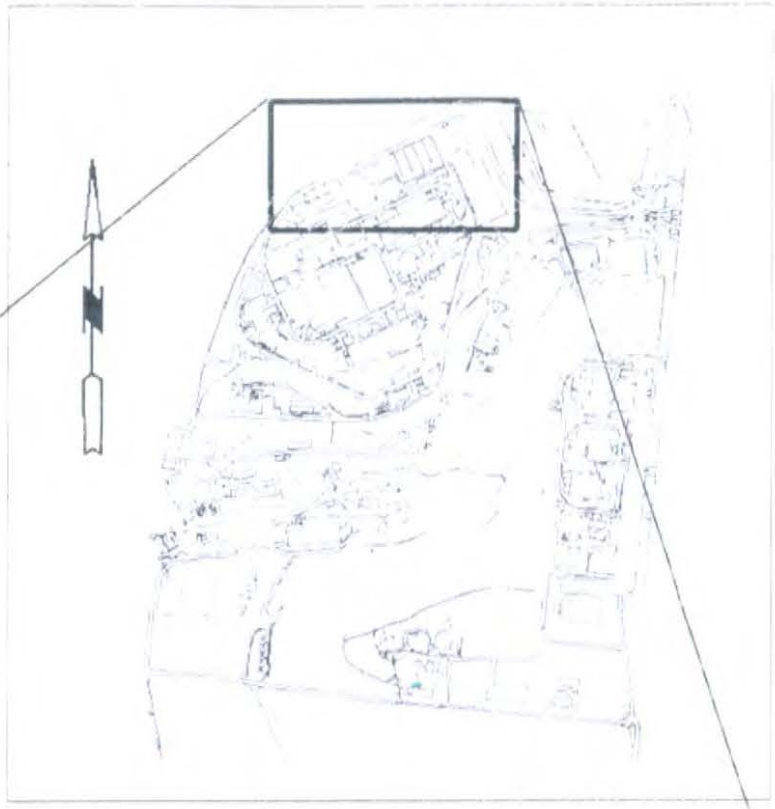
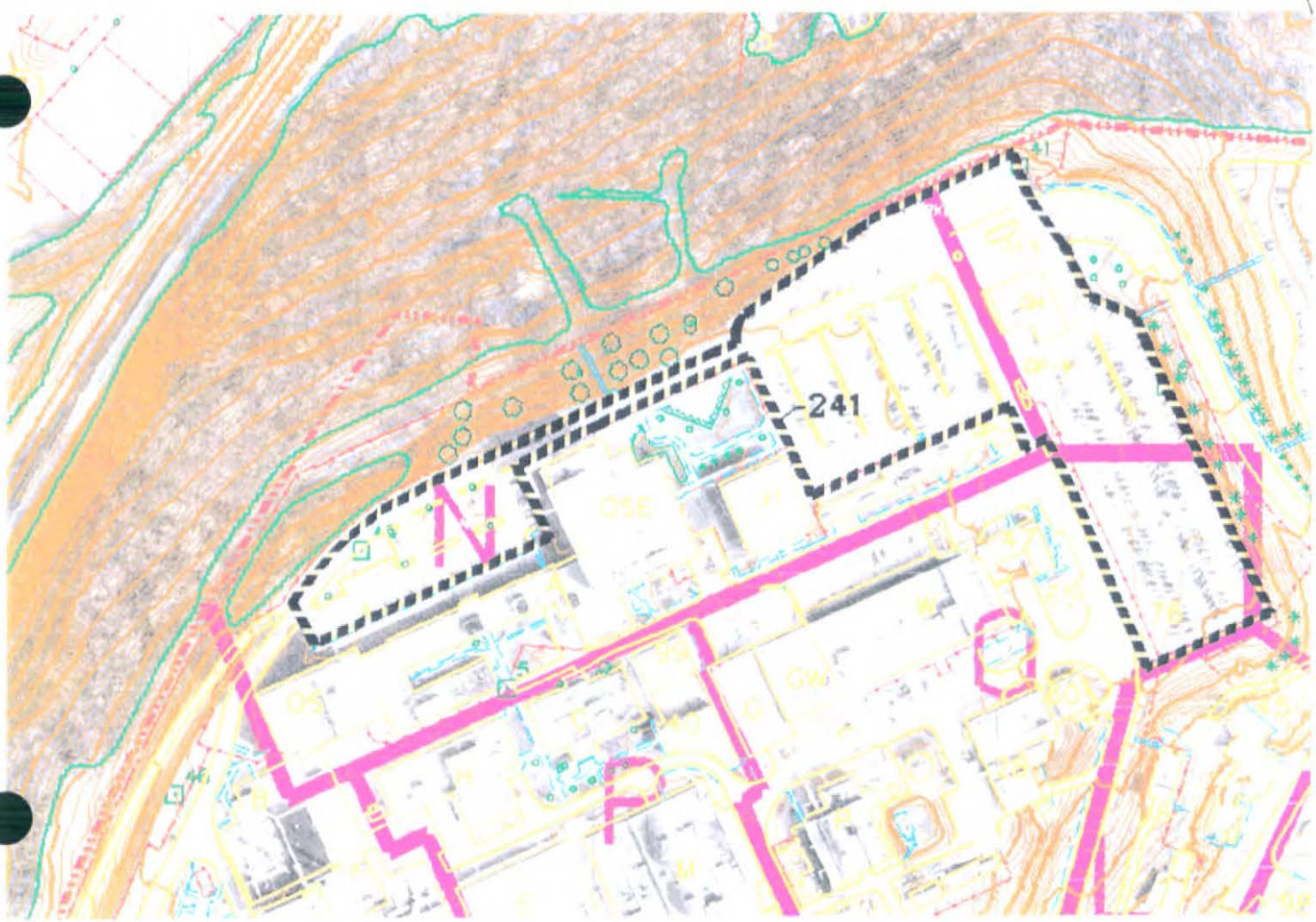
Mound Plant

Release Block N & O

Potential Release Site

PRS 241





PRS 241

PRS HISTORY:

PRS 241 is a soils area located in the northwest parking lots, including the parking lots east of OSE building, south of GH building and the parking lot north of A Building. This PRS was created due to the Soil Gas Survey and Geophysical Investigation - Reconnaissance Sampling Report, Feb. 1993 because of several positive soil gas detections.[4] These areas have always been and still are parking lots. No operations are known to have been performed in the parking lots east of OSE Building and north of A Building that would generate hazardous or radioactive wastes. Activities in the parking lot south of GH Building resulted in the creation of several other PRS's; PRS 99 which is known as Area 6 which contains WD Building Filter-Cleaning Waste whose contaminates of concern are polonium-210, cobalt-60, and radium-266; PRS 100 which is known as Area F which contains the Chromium Trench involving chromium plating bath solution treated with sodium bisulfide, cadmium, nickel, and silver.[1]

In 1987 a trench was dug to investigate the "Groundwater Occurrence and Movement in the Consolidated Bedrock at the D.O.E. Mound Laboratory". The trench, located within the parking lot along the northern edge of the plant boundary running from a point north of GH Building to a point north of Building 91, was 4 ft. wide, 650 ft. long, and 23 ft. deep. The lithologic log of the trench showed concrete and fill to a depth of 1.5 ft.[2] This indicates that the use of fill material in constructing the parking lots was relatively nominal.

CONTAMINATION:

In 1983 and 1984 the Radiological Site Survey Project investigated the soils on the Mound Plant Site for radionuclides by:

- screening using a sodium iodide detector (FIDLER) to identify areas of suspected radioactivity contamination;
- sampling of surface and subsurface soil; and
- analysis of soil samples using one or more of the following methods: radiochemical analysis for plutonium-238 and thorium isotopes, gamma spectroscopy, *in situ* gamma spectroscopy, and liquid scintillation for tritium.

Results found: [3]

Contaminant	Maximum Concentration	Guideline Criteria
Plutonium-238	17.60 pCi/g	25 pCi/g
Thorium	4.47 pCi/g	15 pCi/g
Tritium	1.54 pCi/ml	20 pCi/ml
Cesium-137	0.5 pCi/g	0.46 pCi/g
Radium-226	0.9 pCi/g	5 pCi/g

In 1992 the "Reconnaissance Sampling Report Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill" investigated soils contaminated with volatile organic compounds by collecting soil gas and analyzing by gas chromatography.

Results found: [4]

Contaminant	Maximum Concentration	Guideline Criteria [5]
Trichloroethene (TCE)	8 ppb	2,400 ppb
Toluene	255 ppb	414,600 ppb

* Freon 113 was detected at 865 ppb, no health risk guideline values exist

READING ROOM REFERENCES:

1) OU9 Site Scoping Report: Vol. 12 - Site Summary Report, December 1994. (pages 6-7)
2) Groundwater Occurrence and Movement in the Consolidated Bedrock at the D.O.E. Mound Laboratory, March 1987. (pages 8-11)
3) Operable Unit 9, Site Scoping Report Volume 3 - Radiological Site Survey, June 1993. (pages 12-26)
4) Reconnaissance Sampling Report - Soil Gas and Geophysical investigations Mound Plant and SM/PP Hill, Feb. 1993. (pages 27-30)

OTHER REFERENCES:

5) Comparison of Actual Soil Gas Values with Calculated Acceptable Soil Gas Values, March 1996. (pages 31-33)

PREPARED BY:

Dennis J. Gault, Member of EG&G Technical Staff

MOUND PLANT
PRS 241
Soil Contamination-Main Hill Parking Lot Area

RECOMMENDATION:

PRS 241 consists of the northwest parking lots, including the parking lots east of OSE building, south of GH building and the parking lot north of A Building. This PRS was created due to the Soil Gas Survey and Geophysical Investigation - Reconnaissance Sampling Report, Feb.1993 because of several positive soil gas detections. These areas have always been and still are parking lots. No operations are known to have been performed in the parking lots east of OSE Building and north of A Building that would generate hazardous or radioactive wastes.

In 1992, reconnaissance soil gas sampling detected 8 ppb of trichloroethene (TCE) and 255 ppb toluene. These results were below calculated acceptable soil gas values. In addition, all radionuclides are at or below guideline criteria.

Therefore, NO FURTHER ASSESSMENT is recommended for PRS 241.

CONCURRENCE:

DOE/MEMP: Arthur W. Kleinrath 5/13/97
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 5/13/97
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 5/14/97
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

REFERENCE MATERIAL
PRS 241

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	Re
241	Northwest Parking Lots	D-7	Grounds	Toluene, Freon-113, Trichloroethene	12	Indicated by Soil Gas Survey	S	12	1	SGS[b] Table B.4 Locations 1002, 1007, 1008, 1009, 1010, 1014, 1101, 1102, 1106, 1109, 1110	1
242	VOC Potential Hot Spot Location 1016	D-7	Grounds	Toluene, Trichloroethene	12				1	SGS[b] Table B.4	12
243	VOC Potential Hot Spot Location 1064	E-7	Grounds	Toluene	12						
244	VOC Potential Hot Spot Locations 1076, 1077, 1079, and 1080	E-6	Grounds	Toluene, Freon-113, 1,1,1-Trichloroethane	12						
245	VOC Potential Hot Spot Location 1085	F-6	Grounds	Freon-113, Trichloroethene, 1,1,1-Trichloroethane	12						
246	VOC Potential Hot Spot Locations 1117 and 1118	G-7	Grounds	Tetrachloroethene	12						
247	VOC Potential Hot Spot Location 1129	F-8	Grounds	Freon-113, Trichloroethene, 1,1,1-Trichloroethane, Tetrachloroethene	12	Indicated by soil gas survey	S	12	1	SGS[b] Table B.4	12
248	HH Building Stack	F-7	In service	Polonium-210, Tritium	4, 18	None suspected beyond routine emissions	A	4, 18	Emissions reported in Annual Environmental Monitoring Reports		18
	uilding Stack (NCPDF)	E-6	In service	Tritium	4, 18						
	Building Stack (SW1C)	E-6	In service	Uranium-238	4, 18						
	Building Stack (HEFS)	E-6	In service	Tritium	4, 18						
	B Building Stack	E-6	Inactive	Polonium-210, Tritium	4, 18						
	Building WEST Stack	F-6	In service	Tritium, Plutonium-238 -239, Uranium-238	4, 18						
	Building EAST Stack	E-7	In service	Tritium, Plutonium-238, Uranium-238	4, 18						
	Building Stack (ALR)	F-6	In service	Plutonium-238	4, 18						

LETTER REPORT

GROUNDWATER OCCURRENCE AND MOVEMENT IN THE CONSOLIDATED BEDROCK AT THE D.O.E. MOUND LABORATORY MIAMISBURG, OHIO

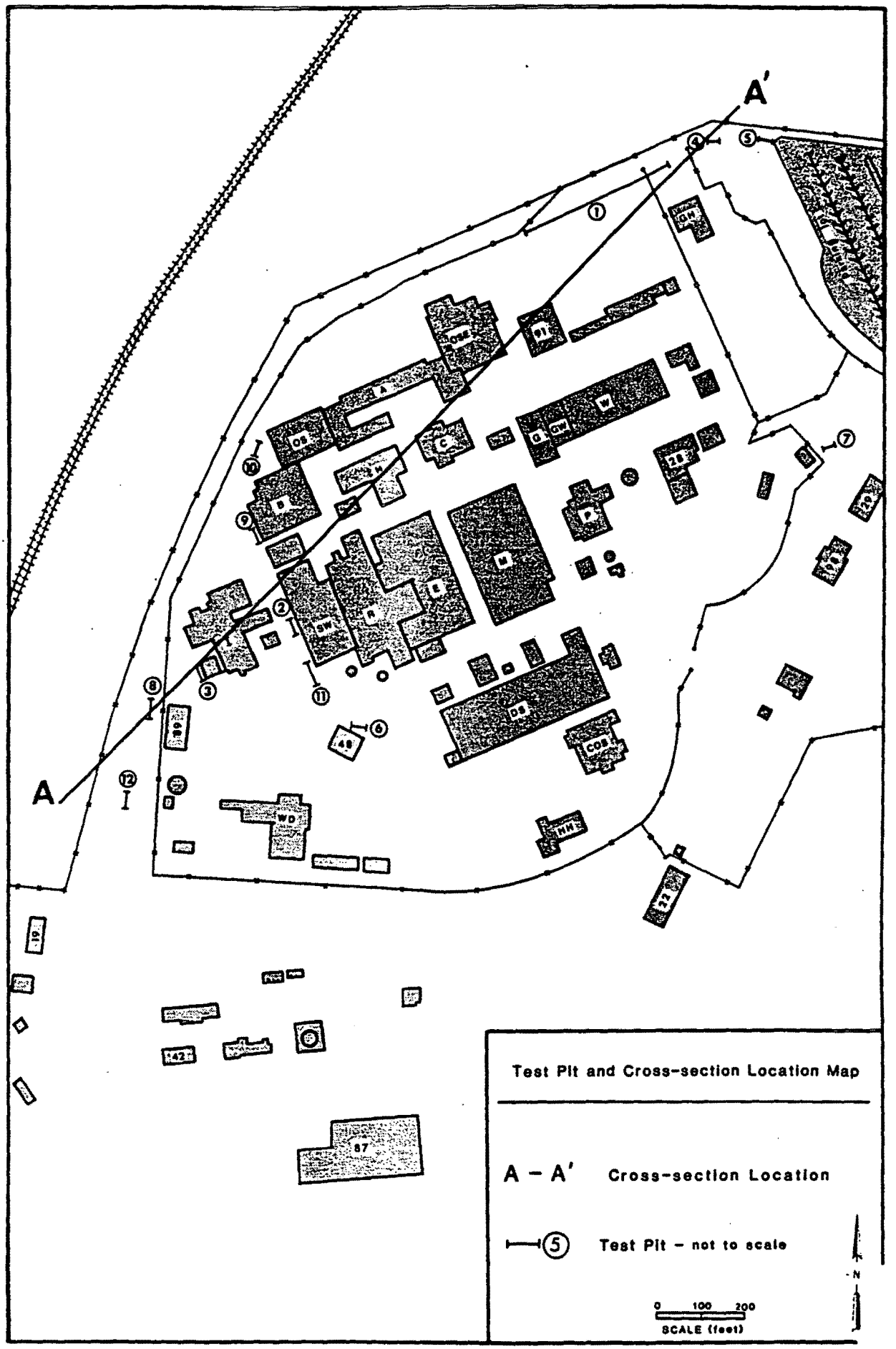
PREPARED FOR

MONSANTO RESEARCH CORPORATION
MIAMISBURG, OHIO

MARCH 19, 1987

TERRAN CORPORATION
HYDROGEOLOGIC CONSULTA
P.O. BOX 1410 FAIRBORN,

Figure 1


A
A'
Test Pit and Cross-section Location Map
A – A' Cross-section Location
Test Pit – not to scale
0 100 200
SCALE (feet)
N

TEST PIT LOG

INSTALLATION ID Pit 1 LOCATION ID Mound Lab
LOCATION TYPE TP LOCATION PROXIMITY I
COORDINATES (FT): SOUTH 960 WEST 2,200-2,740
SURFACE ELEVATION (FTMSL) ave. 872.5
EXCAVATOR CODE _____ CONSTRUCTION METHOD T
DATE STARTED _____ DATE COMPLETED _____
DEPTH (FT) 23

GROUNDWATER LEVELS		
DATE	TIME	DEPTH (FT)

LOCATION DESCRIPTION
Excavation near Building 91 and GH at northern edge of property boundary. Pit dimensions approximately 4'wide X 650' long.

LITHOLOGIC LOG

LOGGER CODE _____

DEPTH (FT)	SAMPLE INTERVAL	SAMPLE METHOD	SAMPLE ID	USCS	VISUAL DESCRIPTION
0-1.5					Concrete and fill material.
1.5-15					Brown clayey shale interbedded with thin
					units of gray crystalline limestone.
15-21					Gray clayey shale interbedded with thin
					units of gray crystalline limestone.
21-23					Gray-blue clayey shale
					Seeps are only on south face of trench,
					north face is dry. Seepage zone is at
					weathered interface. Largest seep
					flows from small crack estimated to
					be less than 500ml/min.

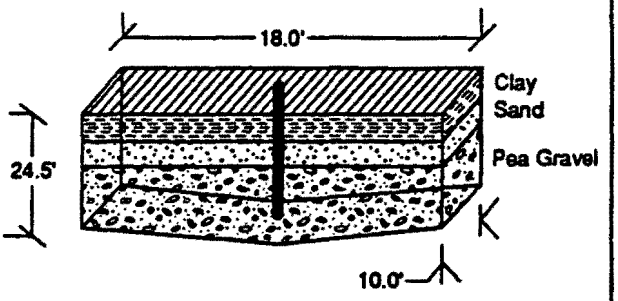
CONSTRUCTION METHODS
A - AIR ROTARY
B - BORED OR AUGERED
C - CABLE-TOOL
D - DUG
H - HYDRAULIC-ROTARY
J - JETTED
P - AIR-PERCUSSION
R - REVERSE ROTARY
T - TRENCHING
V - DRIVEN
W - DRIVE AND WASH
Z - OTHER (SPECIFY)

SAMPLE METHODS
B - UNDISTURBED BLOCK
D - DISTURBED BULK

LOCATION PROXIMITY
I - WITHIN INSTALLATION
O - OUTSIDE INSTALLATION

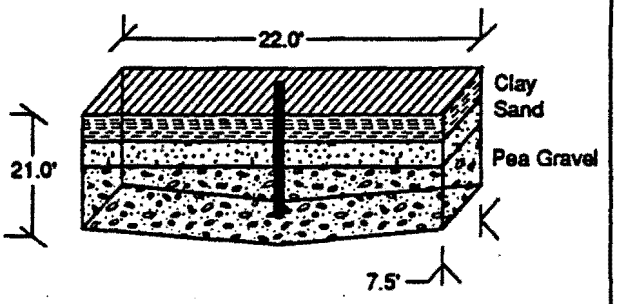
Well 0722 (F.K.A. PIT 12)

Surface Area: 1,372 ft^2
Volume: 4,410 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



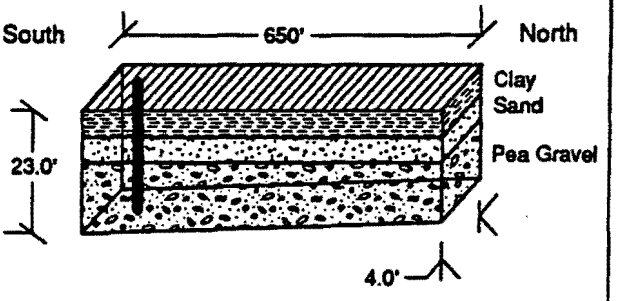
Well 0723 (F.K.A. PIT 6)
(PIT 48)

Surface Area: 1,239 ft^2
Volume: 3,465 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



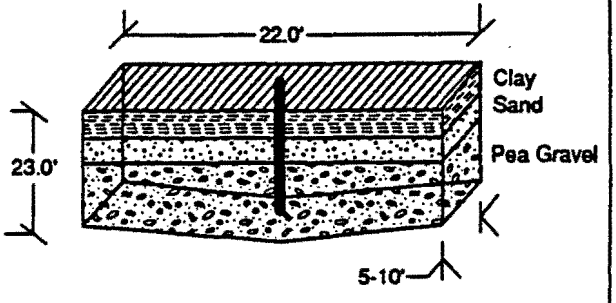
Well 0712 (F.K.A. PIT 1)
(North Trench)

Surface Area: 30,084 ft^2
Volume: 59,800 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



Well 0724 (F.K.A. PIT 7)
(PIT 45)

Surface Area: 1,242-1,472 ft^2
Volume: 2,530-5,060 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



As numbered on pit logs in the report titled "Groundwater Occurence and Movement in Consolidated Bedrock at the DOE Mound Laboratory," March 19, 1987 (Terran 1987).

F.K.A. – Formerly known as

MND-Scop-OU2-01/4-14-92

Figure 4.2. As-built diagrams of test pits with monitoring wells on the Main Hill.

Document Control No. _____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

June 1993

FINAL

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

ER PROGRAM

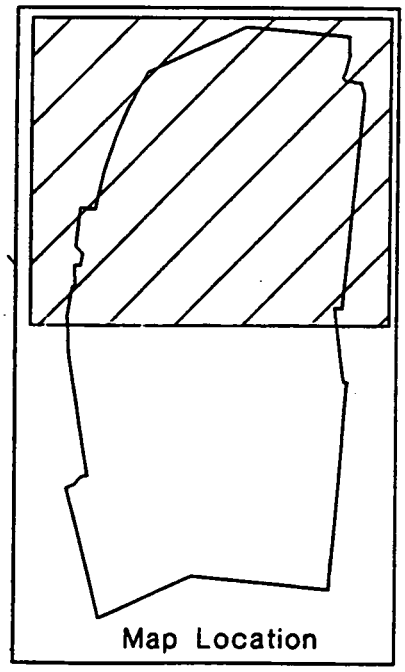
MOUND PLANT

Miamisburg, Ohio

PLATE 1
(1 of 2)

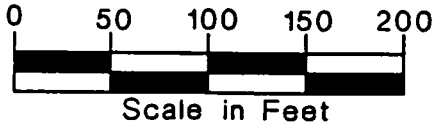
Site Survey Project Sampling Locations

Prepared for
Site Scoping Report: Volume 3,
Radiological Site Survey



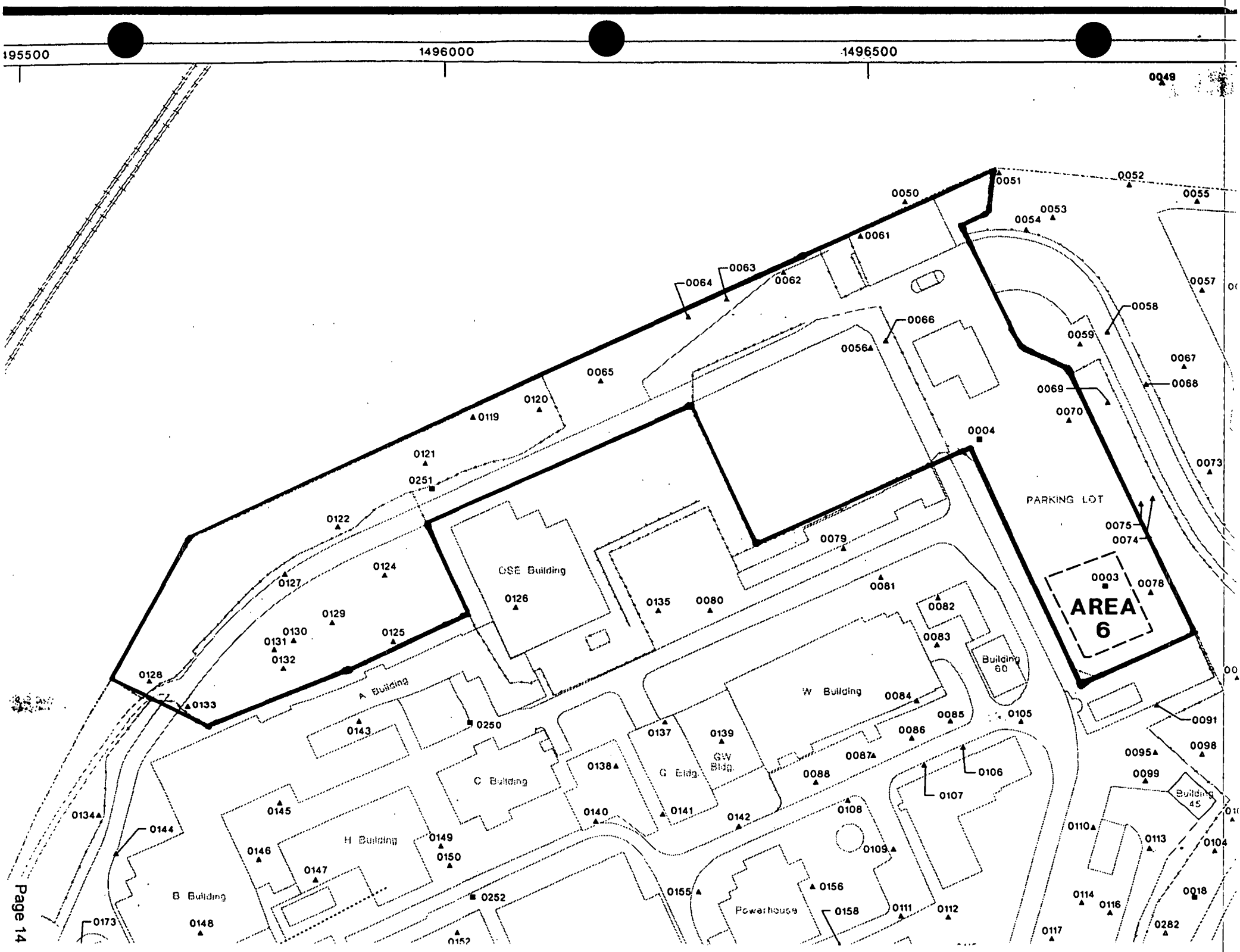
Legend

- Structure
- Paved road
- Dirt road
- Water
- Mound Plant Boundary
- 0015 Surface Location
- 0002 Core Location
- Potential Release Site
- Elevated Activity
- 19-17 Sampling Location for Verification Survey of Former WTS Pipeline



Scale in Feet
1 inch = 100 feet

NOTE: Accuracy of surface locations is +/- 25 feet.


495500
1496000
1496500
AREA 6
PARKING LOT
OSE Building
A Building
B Building
C Building
H Building
W Building
G Bldg.
GW Bldg.
Powerhouse
Building 60
Building 45
0049
0051
0052
0055
0050
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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)
S0037	1675	1730	6738	08-84	0	1.09	b					
S0038	1700	1630	6735	08-84	0	0.18	b					
S0039	1700	1680	2970	10-83	0	0.22	b	0.76				
S0040	1700	1705	6737	08-84	0	1.52	b					
S0041	1725	1605	6734	08-84	0	0.91	b					
S0042	1725	1655	6736	08-84	0	0.33	b					
S0043	1725	1755	6741	08-84	0	0.48	b					
S0044	1775	1505	2969	10-83	0	0.45[c]	b	0.72				
S0045	1775	1555	6733	08-84	0	1.49	b					
S0046	1775	1680	2972	10-83	0	0.86	b	1.06				
S0047	1785	1490	6732	08-84	0	0.44	b					
S0048	1785	1855	2973	10-83	0	0.28	b					
S0049	0900	1860	No MRC results given.									
S0050	0910	2200	6762	08-84	0	0.36	b					
S0051	0925	2085	4058	10-83	0	0.19	b					
S0052	1000	1950	6764	08-84	0	0.89	b					
S0053	1000	2050	6763	08-84	0	3.46	b		LDL	LDL	1	LDL
S0054	1000	2085	4057	10-83	0	0.19[c]	b					
S0055	1050	1885	4059	10-83	0	0.62	b					

Radiochemical Analysis

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)
S0056	1050	2310	4056	10-83	0	0.19	b					
S0057	1150	1925	6765	08-84	0	0.55	b					
S0058	1150	2050	6761	08-84	0	0.57	b					
S0059	1150	2085	4061	10-83	0	1.68	b					
S0060	1175	1885	4060	10-83	0	0.28	b					
S0061	0925	2265	4064	10-83	0	1.50	b					
S0062	0925	2365	4065	10-83	0	1.50	b					
S0063	0925	2440	6766	08-84	0	17.60	b					
S0064	0925	2490	4066	10-83	0	0.25	b					
S0065	0950	2615	4067	10-83	0	0.02	b					
S0066	1050	2290	4063	10-83	0	1.07[c]	b					
C0002	1200	1860	8340	11-84	36	0.10	4.47					
			8341	11-84	72	0.01	2.49					
S0067	1225	1985	6433	08-84	0	0.24	b					
S0068	1225	2035	6434	08-84	0	0.45	b					
S0069	1225	2085	6435	08-84	0	0.10	b					
S0070	1225	2135	6436	08-84	0	0.60	b					
S0071	1250	1385	3030	10-83	0	0.17	b	1.92				
S0072	1350	1960	6439	08-84	0	0.24	b					

Radiochemical Analysis

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)
S0073	1350	2010	3031	10-83	0	0.57	b	1.66				
S0074	1350	2085	6440	08-84	0	0.48	b					
S0075	1350	2100	3032	10-83	0	0.40	b					
C0003	1420	2180	10665	10-85	18	NR	NR		LDL	LDL	0.4	LDL
			10666	10-85	36	NR	NR		LDL	LDL	0.6	LDL
			10667	10-85	54	NR	NR		LDL	LDL	0.7	LDL
			10668	10-85	72	NR	NR		LDL	LDL	0.7	LDL
			10669	10-85	90	NR	NR		LDL	LDL	0.8	LDL
			10670	10-85	108	NR	NR		LDL	LDL	0.9	LDL
			10671	10-85	126	NR	NR		LDL	LDL	0.7	LDL
			10672	10-85	144	NR	NR		LDL	LDL	0.5	LDL
			10673	10-85	162	NR	NR		LDL	LDL	0.4	LDL
			10674	10-85	180	NR	NR		LDL	LDL	0.5	LDL
S0076	1450	1885	3027	10-83	0	2.57[c]	b	1.31				
S0077	1450	2010	3028	10-83	0	0.76	b					
S0078	1450	2135	3029	10-83	0	1.59	b	1.54				
C0004	1200	2240	8342	11-84	36	0.10	4.47					
			8343	11-84	72	0.01	2.49					
S0079	1250	2440	3039	10-83	0	0.03	b	1.32				
S0080	1250	2615	3040	10-83	0	1.19	b					
S0081	1300	2415	6135	08-84	0	0.10	b					
S0082	1350	2365	3038	10-83	0	0.04	b					
S0083	1400	2390	3043	10-83	0	1.14	b					
S0084	1450	2440	6136	08-84	0	0.08	b					

Gamma Spectroscopy

Radiochemical Analysis

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)
S0104	1760	2195	4082	10-83	0	0.18	b	0.38				
S0105	1525	2340	3056	10-83	0	0.01	b	0.90				
S0106	1525	2415	6202	08-84	0	0.06	b					
S0107	1525	2465	6201	08-84	0	0.52	b					
S0108	1525	2565	3061	10-83	0	0.36	b	2.87				
S0109	1600	2540	6197	08-84	0	0.55	b					
S0110	1675	2315	6203	08-84	0	0.41	b					
S0111	1675	2565	6198	08-84	0	0.72	b					
S0112	1700	2515	6200	08-84	0	0.12	b					
S0113	1725	2265	3057	10-83	0	0.06[c]	b					
S0114	1750	2365	6204	08-84	0	0.07	b					
S0115	1750	2515	6199	08-84	0	0.41[c]	b					
S0116	1775	2340	6205	08-84	0	0.04	b					
S0117	1775	2415	3058	10-83	0	0.01	b					
S0118	1775	2615	3060	10-83	0	0.62	b	2.13				
S0119	0925	2770	6767	08-83	0	0.42	b		LDL	0.5	0.9	LDL
S0120	0950	2695	4068	10-83	0	0.25	b					
S0121	0950	2845	4069	10-83	0	0.46	b					
S0122	0975	2970	4070	10-83	0	0.04[c]	b					

Gamma Spectroscopy

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)
C0251	0980	2850	8509	12-84	36	0.05	b					
S0124	1050	2945	4071	10-83	0	0.30	b	0.75				
S0125	1125	2970	4072	10-83	0	0.25	b					
S0126	1150	2820	4073	08-83	0	0.40	b					
S0127	1000	3050	4075	10-83	0	0.30	b					
S0128	1050	3250	4077	10-83	0	0.26[c]	b					
S0129	1075	3025	4074	10-83	0	0.51	b	0.20				
S0130	1075	3075	7101	09-84	0	0.95	b					
S0131	1075	3100	4076	10-83	0	0.26	b					
S0132	1100	3100	7100	09-84	0	0.67	b					
S0133	1100	3225	4078	10-83	0	0.03	b					
S0134	1175	3375	4079	10-83	0	0.47	b					
S0135	1225	2670	3033	10-83	0	0.64	b					
C0250	1255	2930	8395	12-84	36	0.01	b					
S0137	1350	2720	6177	08-84	0	0.18[c]	b					
S0138	1375	2795	6178	08-84	0	0.12	b					
S0139	1400	2670	3034	10-83	0	0.23	b					
S0140	1425	2845	3037	10-83	0	0.36	b					
S0141	1450	2770	6179	08-84	0	0.68	b					

Radiochemical Analysis

ER PROGRAM

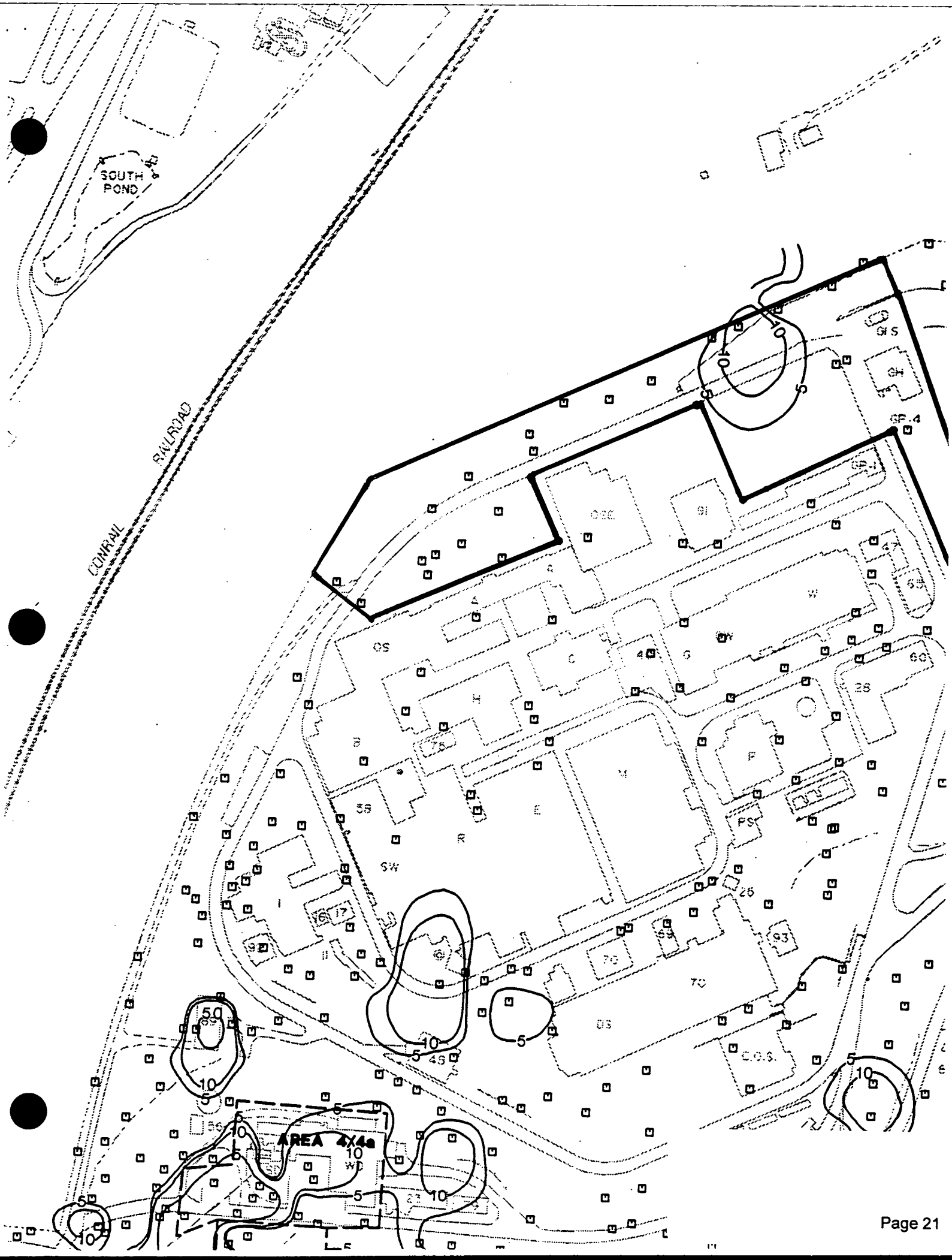
MOUND PLANT

Miamisburg, Ohio

PLATE 4
Site Survey Project
Plutonium Concentrations

Prepared for

Site Scoping Report: Volume 3,
Radiological Site Survey


SOUTH POND
CONRAIL RAILROAD
AREA 4X4a

ER PROGRAM

MOUND PLANT

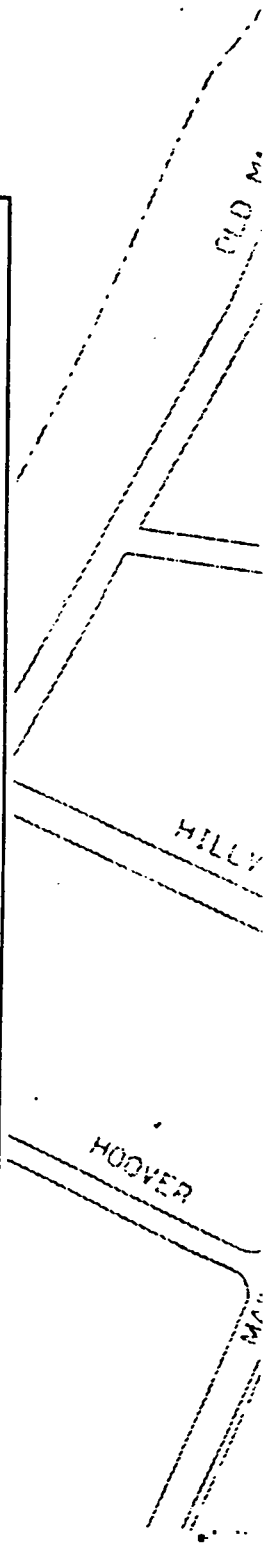
Miamisburg, Ohio

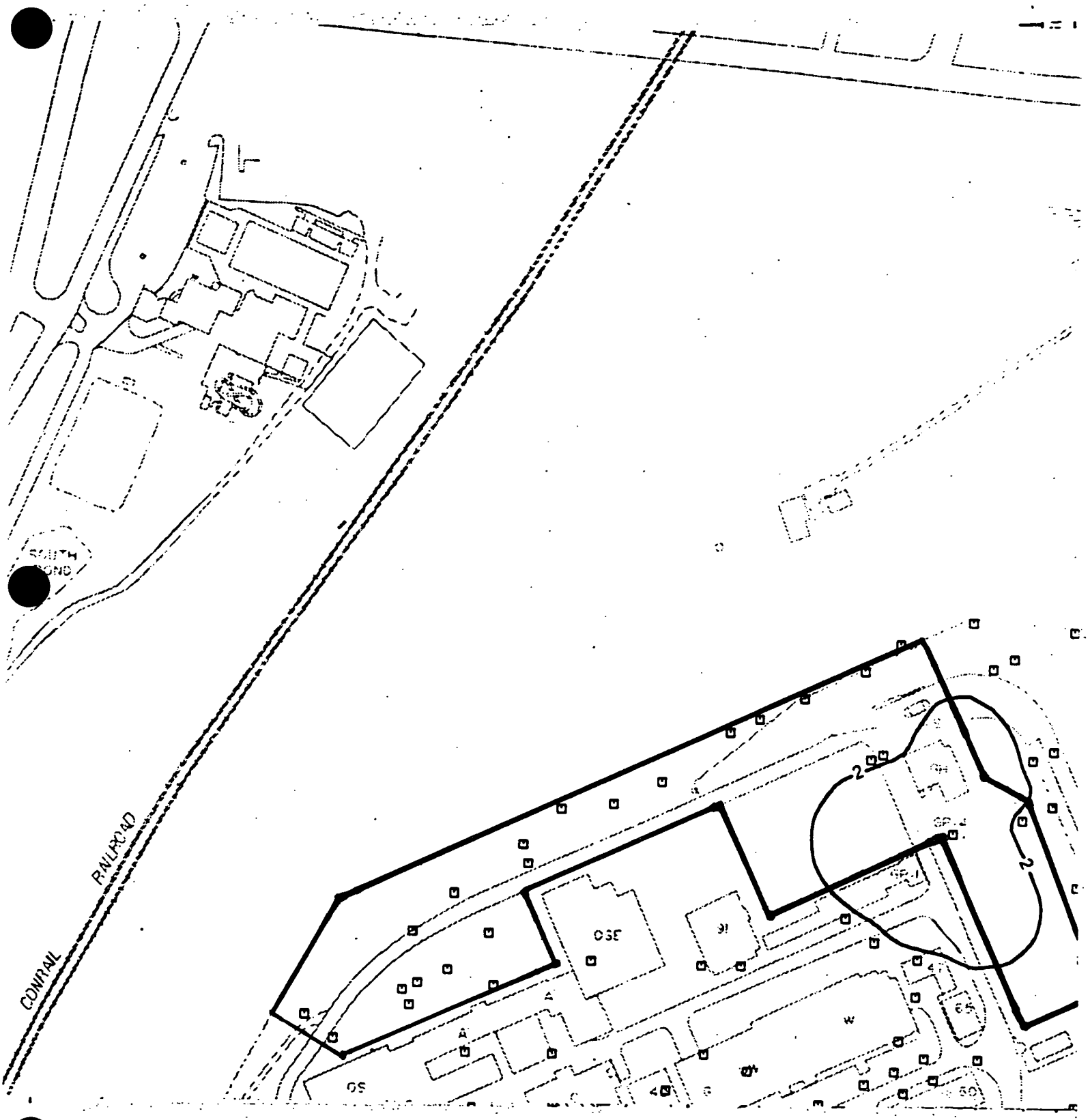
PLATE 5

Site Survey Project Thorium Concentrations

Prepared for

Site Scoping Report: Volume 3, Radiological Site Survey




CONRAIL
RAILROAD
2
2

Environmental Restoration Program

RECONNAISSANCE SAMPLING REPORT SOIL GAS SURVEY AND GEOPHYSICAL INVESTIGATIONS, MOUND PLANT MAIN HILL AND SM/PP HILL

REPORT
APPENDICES A, B AND D

MOUND PLANT
MIAMISBURG, OHIO

February 1993

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

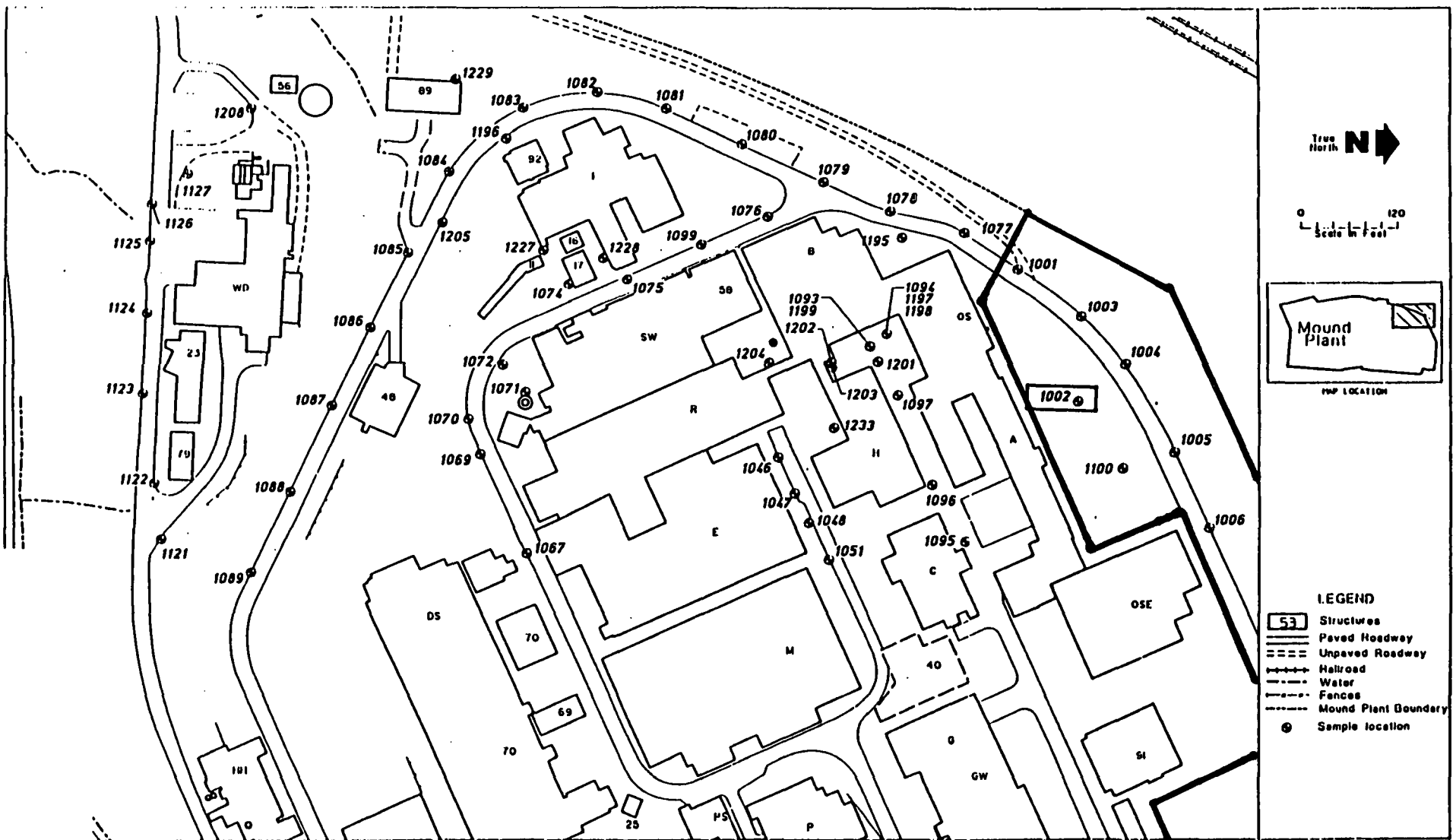


Figure 2.1. Main Hill west sample location map.

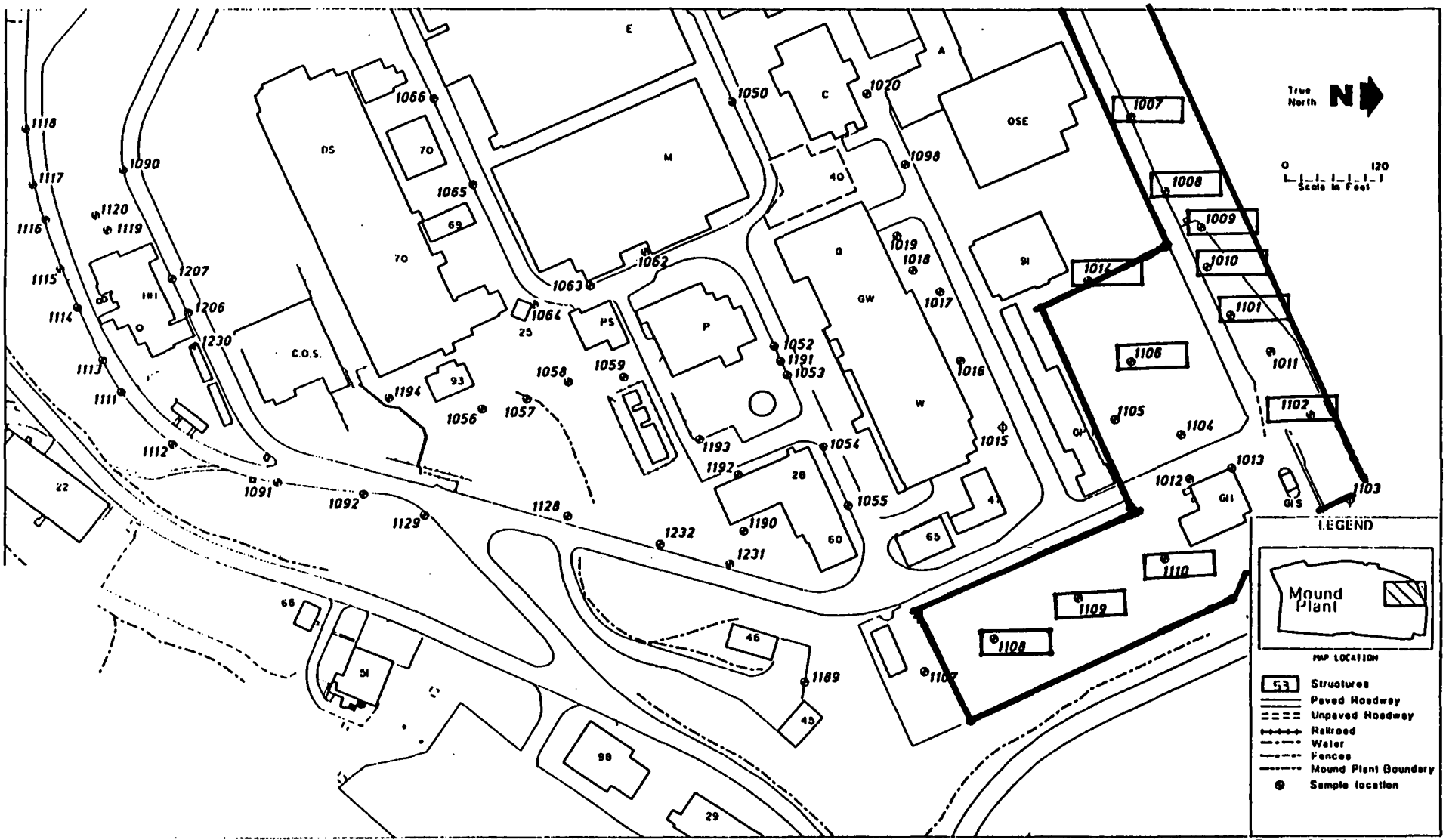


Figure 2.2. Main Hill east sample location map.

TABLE II.4. SUMMARY OF POSITIVE DETECTIONS–MAIN HILL
(ppb)

SAMPLE ID	SAMPLE DATE	FREON 11	FREON 113	TRAN–12DCE	CIS–12DCE	111TCA	PCE	TCE	TOLUENE
MND-01-1002-1003	28 JUL 92	---	---	---	---	---	---	---	40
MND-01-1003-0005	28 JUL 92	---	---	---	---	---	---	---	3 *
MND-01-1005-0005	28 JUL 92	---	---	---	---	---	---	---	21 *
MND-01-1007-0005	29 JUL 92	---	---	---	---	---	---	2	---
MND-01-1008-0005	29 JUL 92	---	---	---	---	---	---	---	5
MND-01-1008-1005	29 JUL 92	---	---	---	---	---	---	---	3
MND-01-1009-0005	29 JUL 92	---	---	---	---	---	---	4	19
MND-01-1010-0005	29 JUL 92	---	---	---	---	---	---	---	13
MND-01-1014-0005	29 JUL 92	---	---	---	---	---	---	---	8
MND-01-1016-0003	30 JUL 92	---	---	---	---	---	---	2	8
MND-01-1046-0005	4 AUG 92	---	---	---	---	2	---	188	3 *
MND-01-1047-0005	4 AUG 92	---	---	---	---	7	---	4	---
MND-01-1048-0005	4 AUG 92	---	---	---	---	6	---	4	---
MND-01-1050-0003	4 AUG 92	---	---	---	---	---	---	8	---
MND-01-1050-1003	4 AUG 92	---	---	---	---	---	---	17	27 *
MND-01-1051-0003	4 AUG 92	---	---	---	---	---	---	8	5 *
MND-01-1052-0003	4 AUG 92	---	---	---	---	---	---	---	13 *
MND-01-1053-0002	5 AUG 92	2	---	---	---	---	---	---	447
MND-01-1054-0005	5 AUG 92	4	---	---	---	7	---	228 *	11
MND-01-1055-1005	5 AUG 92	---	---	---	---	---	---	4 *	5
MND-01-1057-0005	5 AUG 92	---	---	---	---	---	---	---	24
MND-01-1062-0003	5 AUG 92	---	---	---	---	13	---	6	---
MND-01-1064-0005	11 AUG 92	---	---	---	---	---	---	---	19
MND-01-1066-0005	11 AUG 92	---	---	---	---	6	---	---	228
MND-01-1067-0005	11 AUG 92	---	---	---	---	---	---	11	133
MND-01-1069-1005	12 AUG 92	---	---	---	---	---	---	---	37
MND-01-1070-0005	12 AUG 92	---	---	---	---	---	---	---	5
MND-01-1070-1005	12 AUG 92	---	---	---	---	---	---	---	5
MND-01-1072-0005	12 AUG 92	---	---	---	---	---	---	---	106
MND-01-1074-0005	12 AUG 92	---	799	---	---	---	1191	---	5
MND-01-1074-1005	12 AUG 92	---	812	---	---	---	1117	---	5
MND-01-1075-0005	12 AUG 92	---	---	---	---	---	---	---	80
MND-01-1076-0005	12 AUG 92	---	2934	---	---	148	---	---	---
MND-01-1077-0005	12 AUG 92	---	---	---	---	---	---	---	27
MND-01-1079-0005	13 AUG 92	---	13	---	---	---	---	---	---
MND-01-1080-0005	13 AUG 92	---	13	---	---	---	---	---	---
MND-01-1085-0005	13 AUG 92	---	102	---	---	22	---	41	---
MND-01-1086-0005	13 AUG 92	---	47	---	---	---	---	---	---
MND-01-1093-0005	15 AUG 92	---	**131000	247	40800	---	---	**34780	53 *
MND-01-1094-0005	14 AUG 92	---	83	13	485	---	---	978	---
MND-01-1097-0002	14 AUG 92	---	---	---	---	---	---	6	8
MND-01-1099-0005	15 AUG 92	---	---	---	---	---	---	4	8 *
MND-01-1101-0005	16 AUG 92	---	865	---	---	---	---	---	8
MND-01-1102-0005	16 AUG 92	---	419	---	---	---	---	---	13
MND-01-1106-0003	16 AUG 92	---	329	---	---	---	---	6	---
MND-01-1108-0005	16 AUG 92	---	---	---	---	---	---	6	---
MND-01-1109-0005	16 AUG 92	---	---	---	---	---	---	8	13
MND-01-1110-0005	16 AUG 92	---	---	---	---	---	---	---	255

COMPARISON OF ACTUAL SOIL GAS VALUES WITH CALCULATED ACCEPTABLE SOIL GAS VALUES

SCREENING POTENTIAL RELEASE SITES BASED ON SOIL GAS READINGS

Soil gas readings can be utilized in the PRS screening process to identify potential release sites that may present a potential soil contamination problem for volatile organics. The soil gas survey that was conducted at Mound as part of the "Reconnaissance Sampling Report–Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill" investigated 8 volatile compounds. The concentrations of these compounds in the in the vapor phase within the pore spaces of the soil can be correlated to the actual soil contaminant concentrations by utilizing a method developed by ICF Kaiser Engineers. This technique has been used with US EPA Region IX approval at a large Superfund site contaminated with many of the same chemicals found at relatively low levels in soils at the Mound Plant.

The soil concentration can be estimated from the soil gas values by the following equation:

$$Ct = (Cg/Pb)*[[Pb * Kd / H] + [pw / H] + [pt - pw]]$$

where

Cg	concentration of volatile chemical concentrations as soil vapor in ng/ml
Pb	Bulk density of the soil in g/ml
Kd	soil/water partition coefficient in ml/g
H	Dimensionless Henry's Law Constant
pw	water filled porosity
pt	total porosity
Ct	target soil concentration in ng/g or ug/kg (ppb)

The technique that Mound Plant will use for screening a PRS, is to compare the soil gas values obtained at a PRS with soil gas concentrations that are known to be below any regulatory or health based level of concern. The risk based guideline values for the Mound Plant (DOE, December 1995) soils are based upon 10^{-6} risk levels or a hazard index of 1. These values correspond to direct soil exposure to persons who's activities place them at the highest risk, in particular inhalation and ingestion by a Mound Plant construction worker.

Another potential exposure path must be considered, however. The potential for some of the organic contaminants to leach into ground water must be considered in developing protective soil screening levels. A "Mound Plant Soil Screening Level" paper explains the calculation of soil screening levels. For all of the chemicals that the soil gas survey identified, the calculated soil screening level soil concentrations are below the standard guideline values, therefore they are more conservative and are appropriate to be used as the basis for the soil gas calculations.

By re-arranging the equation, and using either the soil guideline values or the soil screening levels as the target soil concentration, a soil gas concentration can be calculated; this calculated soil gas concentration can be compared to the actual observed soil gas values:

$$Cg = (Pb*Ct)/[[Pb*Kd/H] + [pw/H] + [pt-pw]]$$

The values of the soil specific and chemical parameters for this equation are summarized as follows:

Pb	1.6	Bulk density of the soil in g/ml
pw	0.15	water filled porosity
pt	0.43	total porosity
foc	0.02	fraction organic material in soil (used in developing the SSL values)

Typical chemicals that are detected with soil gas sampling are:					
NAME	H	Kd	Calculated Acceptable Soil Screening Level Value	Calculated Acceptable Soil Gas Reading	Calculated Acceptable Soil Gas Reading
		ml/g	mg/kg (ppm)	ng/ml	ppb
Toluene	2.52E-01	3.42	22.06	1.56E+03	414600
Trichloroethene (TCE)	4.35E-01	2.24	0.07	1.26E+01	2400
111 Trichloroethane (TCA)	7.63E-01	2.2	3.01	9.46E+02	173400
Trans-1,2 Dichloroethene (DCE)	2.29E-01	1	0.70	1.41E+02	35700
cis-1,2 Dichloroethene (DCE)	1.85E-01	2.78	0.31	1.97E+01	5000
Freon 11	NA	NA			
Freon 113	NA	NA			
Tetrachloroethene (PCE)	7.09E-01	2.78	0.09	2.13E+01	3100

na not available

IF THE SOIL GAS READING IS BELOW THE VALUES IN THE CALCULATED SOIL GAS READING COLUMN (SHADED), THEN THERE IS NO THREAT TO GROUNDWATER FROM THIS PRS.

The soil screening level values are calculated using the Soil Screening Methodology. The Potential Release Site is assumed to be more than 100 meters from a potential drinking water source with an aquifer thickness of 15 meters and a source size of 10 meters. The hydraulic gradient is assumed to be 0.01 which is conservative for most of the Mound Plant PRSs. In special instances where the PRS lies less than 100 meters from a potential drinking water source, or the hydraulic gradient is much less than 0.01, new SSL values and new acceptable soil gas values will be calculated for that particular PRS.