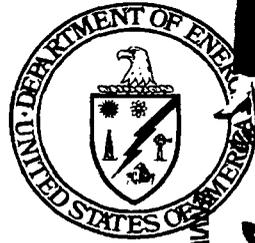


MOUND



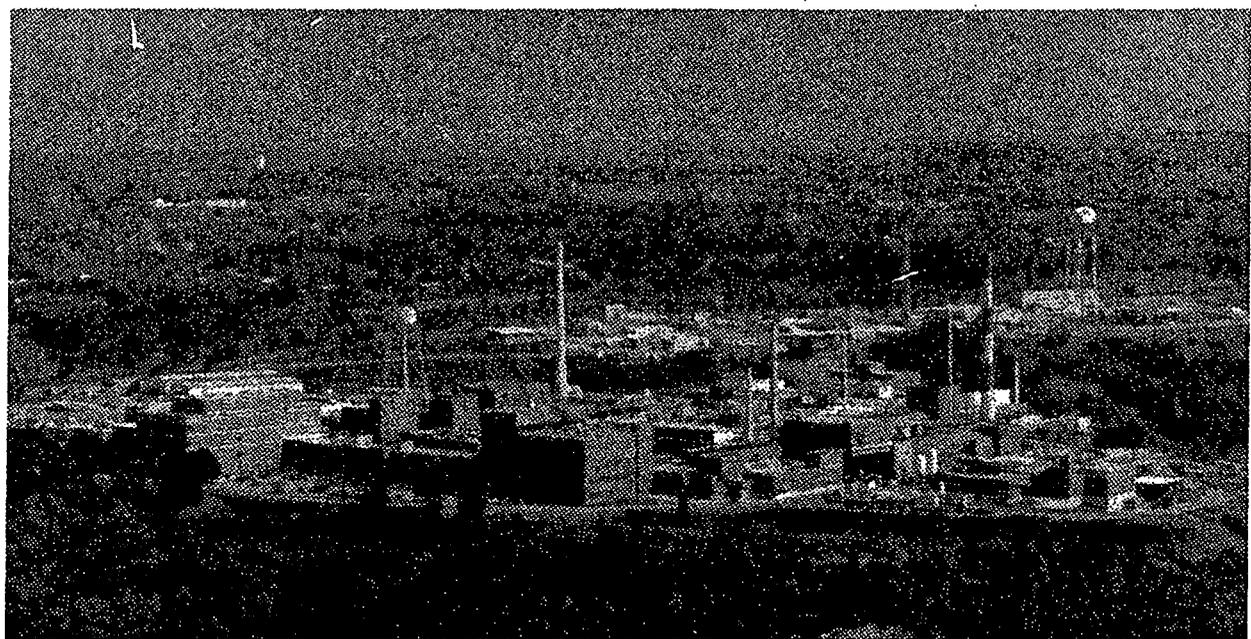
**Environmental
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MOUND PLANT

Potential Release Site Package

PRS # 307



PRS 307

REV	DESCRIPTION	DATE
0 PUBLIC RELEASE	Available for comments.	Apr. 15, 1997
1 FINAL		



MOUND PLANT

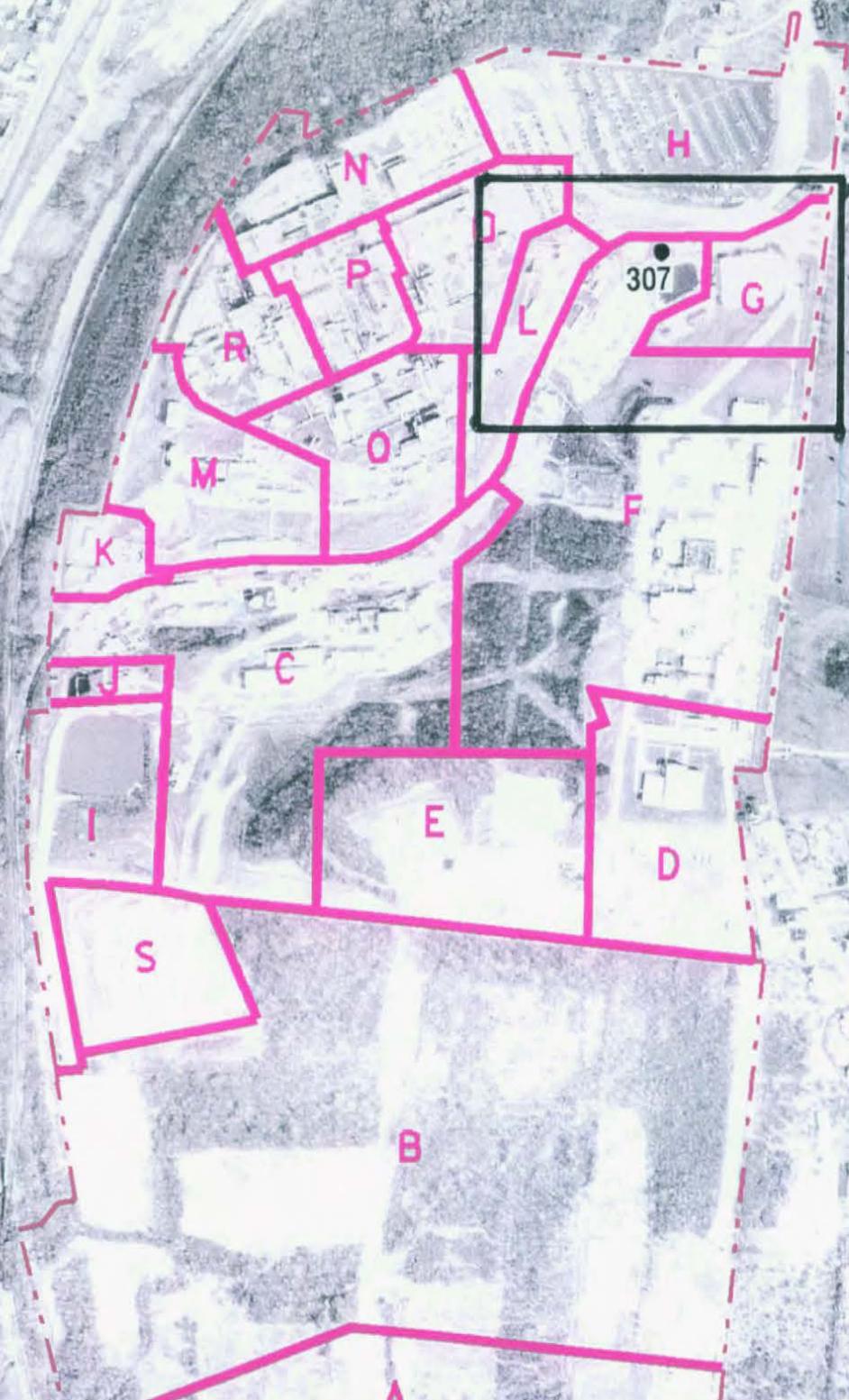
Release Block F

Potential Release Site

PRS 307



307

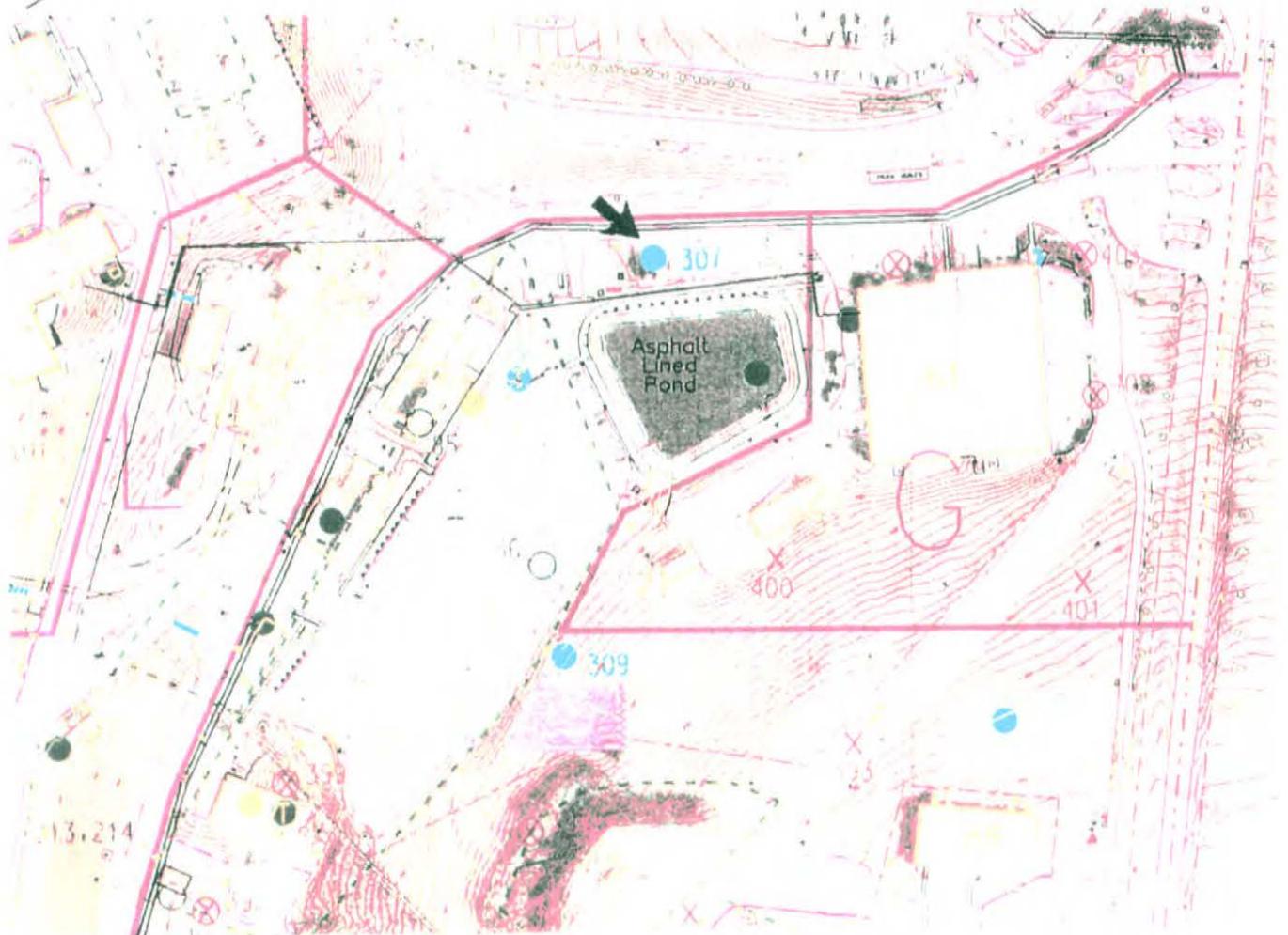


MOUND PLANT

Release Block F

Potential Release Site

PRS 307





PRS 307

PRS HISTORY

PRS 307 is located north of the asphalt lined pond just off the Mound plant road. PRS 307 was created due to a subsurface thorium detection found during the Radiological Site Survey Project² (location C0007). The top 10 feet of the PRS 307 area is comprised of fill material.⁸

No radioactive or hazardous waste generating processes or activities are known to have occurred at the location of PRS 307. Building 61, which is located southeast of PRS 307, has never been utilized for radioactive activities or processes. However, Building 61 was the former soils area for the staging of heavy equipment (reference the combination PRS package 65, 402, 403 and 404). Building 29, which is southwest of PRS 307, has never been utilized for radioactive activities or processes.

CONTAMINATION

- 1) In 1983 through 1984, the Radiological Site Survey² investigated Mound soils for radionuclides via Mound's Soil Screening facility, radiochemistry and gamma spectroscopy. Four samples were taken in the vicinity of PRS 307. Three were surface samples (S0048, S0228 and S0273), and one was a core sample (C0007). The samples were analyzed for plutonium and thorium. Results showed:

<i>Contaminant</i>	<i>Maximum Concentration Detected</i>	<i>Guideline Criteria</i>
Plutonium-238	1.07 pCi/g ^{ref 2} (in surface soil)	25 pCi/g (Mound ALARA in soil)
Thorium-232	41.6 pCi/g ^{ref 2} (in soil @ 4.5 feet)	15 pCi/g ^{ref 4} (in subsurface soil)

NOTE: pCi = picocuries, g = grams, ALARA = As low as reasonably achievable

- 2) In 1994, the OU5 Phase I Area 7 Field Report³ reported:
- A) PETREX Soil Gas readings in the PRS 307 area showed hydrocarbon readings that were elevated in relation to other PETREX hydrocarbon readings in the area.
 - B) One soil boring at location #B01 (consisting of one surface sample and 8 subsurface samples) was taken approximately 50 feet southwest of PRS 307. The samples were analyzed for radionuclides by Mound Soil Screening. Results showed:

<i>Contaminant</i>	<i>Maximum Concentration Detected</i>	<i>Guideline Criteria</i>
Plutonium-238	30 pCi/g ^{ref 3} (in soil at 15-17 inch depth)	25 pCi/g (Mound ALARA in soil)
Thorium-232	1.1 pCi/g ^{ref 3} (in soil at 30-32 inch depth)	15 pCi/g ^{ref 4} (in subsurface soil)

C) Radionuclides, VOCs, SVOCs and metals were sampled during installation of monitoring well #0322 (located approximately 30 feet south of PRS 307). Results showed:

- All radionuclides in the soil were below either federal regulations or the 10⁻⁶ Risk Based Soil Guidelines.
- All organics in the soil were below the 10⁻⁶ Risk Based Soils Guidelines.

D) In 1992, qualitative soil gas was performed in the vicinity of PRS 307. Results showed no VOC detections.

3) The OU9 Hydrogeological Investigation: Groundwater Sweeps Report ⁷ sampled well #0322 (see 2C above) for radionuclides and metals. Results showed all metals and radionuclides contaminant concentrations were less than the drinking water guideline criteria established by the Safe Drinking Water Act.

4) In the summer of 1995, the Other Soils Characterization ⁵ sampled eighteen surface and subsurface soil locations surrounding PRS 307. The historical location of PRS 307 (sample 9401-5004 and 9401-5008) could not be sampled due to the presence of underground utilities. Samples were analyzed for organics via organic vapor analyzer and or organic vapor meter, metals via X-ray fluoroscope, and radionuclides via FIDLER and Mound gamma spectroscopy. Results showed:

- A FIDLER survey of the 18 soil samples found no detections above background. Lab results were processed for only 10 of the 18 samples (see map on page 69). Results showed all samples were below either the regulatory limits or the 10⁻⁶ Risk Based Guideline Values with the one exception shown below:

<i>Contaminant</i>	<i>Maximum Concentration Detected</i>	<i>Guideline Criteria</i>
Plutonium-238	81 pCi/g ^{ref 5} (in soil at 4 to 8 feet)	25 pCi/g (Mound ALARA in soil)

- None of the eighteen samples had any organic detections in excess of background.
- Only fourteen of the eighteen samples were analyzed for metals. No metals were detected above the 10^{-6} Risk Based Guideline Values.

READING ROOM REFERENCES:

- 1) OU9, Site Scoping Report: Vol 12 - Site Summary Report, December 1994 (pages 5-7)
- 2) OU9, Site Scoping Report, Vol. 3 - Radiological Site Survey (pages 8-14).
- 3) OU5 Operational Area Phase I Investigation Non-AOC Field Report Vol 1 Text and Vol 2 Appendices A-G (pages 15-66).
- 6) Risk Based Soil Guidelines, December 1995, Revision 0 (pages 75-77).
- 7) The OU9 Hydrogeological Investigation: Groundwater Sweeps Report, April 1995, Revision 1. (pages 78-80)
- 8) OU9, Hydrogeological Investigation: Well Information Report, January 1994. (pages 81-83)

OTHER REFERENCES:

- 4) Code of Federal Regulations, 40 CFR 192.12 and 40 CFR 192.41.
- 5) Other Soils Characterization Report, Draft, Vol 1 Text and Vol 2- Appendices, June 1996. (pages 67-74)

PREPARED BY:

Gerald F. Maul, Member of EG&G Technical Staff
George Liebson, Member of EG&G Technical Staff

MOUND PLANT
PRS 307
Soil Contamination – Building 29

RECOMMENDATION:

Potential Release Site (PRS) 307 was identified due to a subsurface thorium detection. Subsequently, ten samples were collected in 1994 and 1995. The results were below the regulatory standard for thorium in surface soil (5 pCi/g) and subsurface soil (15 pCi/g). Only one plutonium sample was above the 10^{-6} guideline value. That sample result (81 pCi/g) was below the 2×10^{-5} risk-based guideline value of 110 pCi/g. Recent sampling in 1995 for organic compounds resulted in no detections.

Therefore, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB:	<u>Arthur W. Kleinrath</u>	<u>3/31/97</u>
	Arthur W. Kleinrath, Remedial Project Manager	(date)
USEPA:	<u>Timothy J. Fischer</u>	<u>3/31/97</u>
	Timothy J. Fischer, Remedial Project Manager	(date)
OEPA:	<u>Brian K. Nickel</u>	<u>3/31/97</u>
	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
FOR PRS 307**

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 Inclinator	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/RR Hill Seen 0609	I-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

- 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 Scoping 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, OUG, (FINAL)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scoping 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 1992i "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**

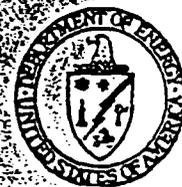
**MOUND PLANT
MIAMISBURG, OHIO**

June 1993

FINAL

**Department of Energy
Albuquerque Field Office**

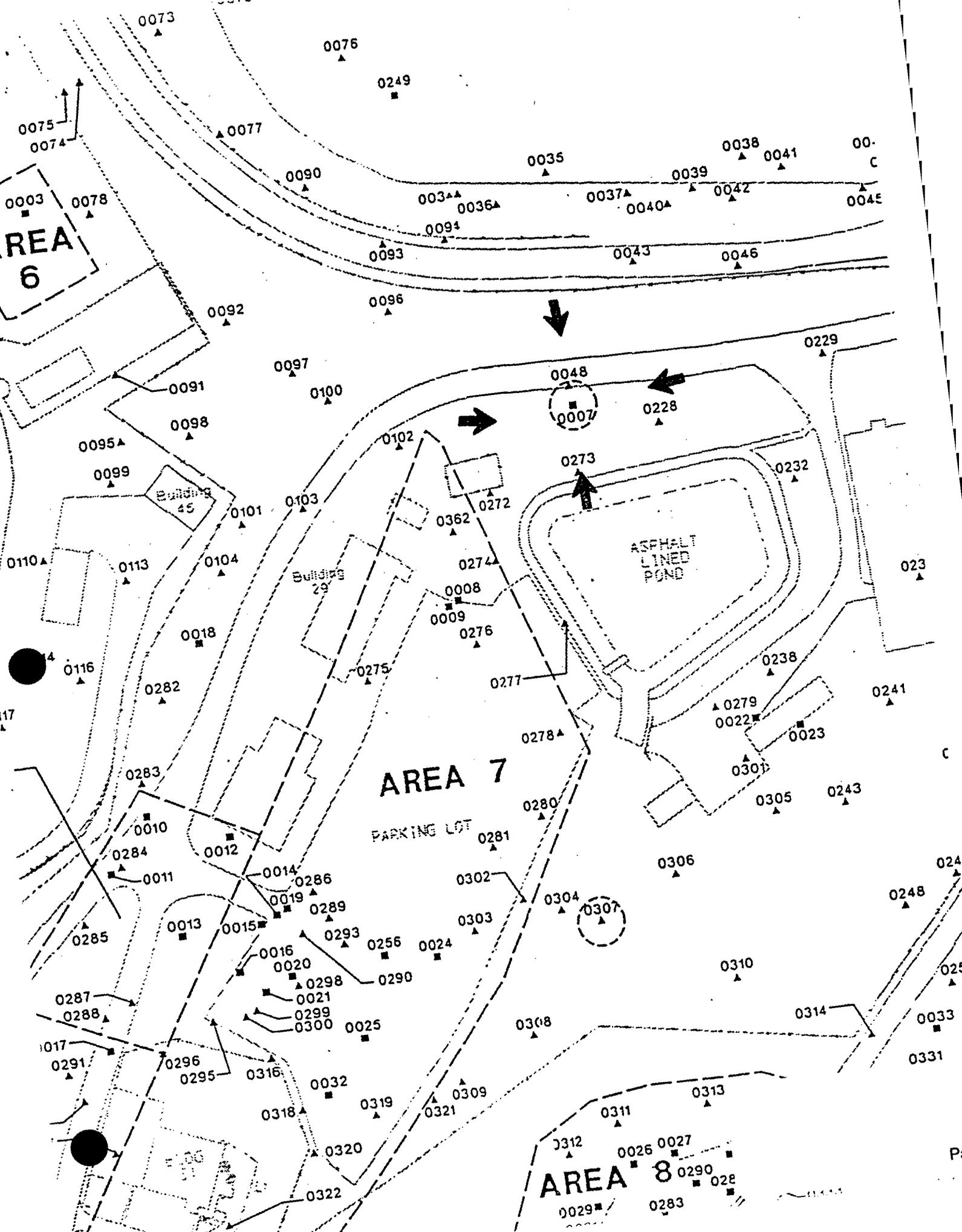
Environmental Restoration Program
EG&G Mound Applied Technologies



AREA 6

AREA 7

AREA 8



RADIOCHEMICAL ANALYSIS

map Locallon ^a	Coordinates		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	0.38	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					

E-3

RADIOCHEMICAL ANALYSIS

Map Location ^a	South	West	No.	Mo-Yr	(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)
S0218	1875	1385	2977	10-83	0	2.03	b					
S0219	1900	1280	6742	08-84	0	3.94	b		LDL	0.6	0.7	LDL
S0220	1950	1275	2978	10-83	0	1.50	b	0.71				
S0221	1995	1425	2974	10-83	0	0.74	b	0.52				
S0222	2035	1410	6743	08-84	0	2.34	b					
S0223	2035	1460	6746	08-84	0	2.58	b		LDL	1.3	1.2	LDL
S0224	2050	1335	2979	10-83	0	1.34 ^c	b					
S0225	2075	1360	6744	08-84	0	2.47	b					
S0226	2075	1400	2975	10-83	0	3.78	b	0.99				
S0227	2085	1435	6745	08-84	0	2.98	b					
C0005	1800	1480	8344	11-84	54	0.01	b					
			8345	11-84	108	0.04	b					
 S0228	1850	1805	2866	10-83	0	1.07	b					
S0229	1875	1655	2865	10-83	0	1.06	b					
S0230	1895	1525	2868	10-83	0	3.34	b					
S0231	1950	1530	6747	08-84	0	0.04	b					
S0232	1950	1730	2863	10-83	0	0.56	b					
S0233	2000	1505	6749	08-84	0	1.52	b					
S0234	2000	1555	6748	08-84	0	0.20	b					

RADIOCHEMICAL ANALYSIS

Map Location ^a	Coordinates		MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium ^b (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Ca-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)			
	South	West													
S0271	2650	1755	2826	10-83	0	0.01	b								
→ C0007	1800	1860	8352	11-84	54	0.39 ^c	41.63 ^c								
			8353	11-84	108	0.08 ^c	5.14 ^d								
S0272	1825	1960	5972	07-84	0	0.37	b								
→ S0273	1850	1885	2871	10-83	0	0.04	b								
S0274	1875	1985	5971	07-84	0	0.01	b								
C0008	1885	2030	10611	09-85	18	NR	NR		LDL	LDL	0.6	LDL			
			10612	09-85	36	NR	NR		LDL	LDL	0.6	LDL			
			10613	09-85	54	NR	NR		LDL	LDL	0.7	LDL			
			10614	09-85	72	NR	NR		LDL	1.2	0.7	LDL			
			10615	09-85	90	NR	NR		LDL	LDL	0.9	LDL			
			10616	09-85	108	NR	NR		LDL	LDL	0.5	LDL			
			10617	09-85	126	NR	NR		LDL	LDL	1	LDL			
			(Note: 50 pCi/g of Ac-227 was detected in this sample using gamma spec.)												
			10618	09-85	144	NR	NR		LDL	LDL	1	LDL			
			(Note: 1400 pCi/g of Ac-227 was detected in this sample using gamma spec.)												
			10619	09-85	162	NR	NR		LDL	LDL	0.9	LDL			
			10620	09-85	180	NR	NR		LDL	LDL	0.5	LDL			
			10621	09-85	198	NR	NR		LDL	LDL	1	LDL			
			(Note: 300 pCi/g of Ac-227 was detected in this sample using gamma spec.)												
			10622	09-85	216	NR	NR		LDL	LDL	0.7	LDL			
			(Note: 10 pCi/g of Ac-227 was detected in this sample using gamma spec.)												
			C0009	1885	2040	10713	09-85	0	NR	NR		LDL	LDL	0.5	LDL
10714	09-85	18				NR	NR		LDL	LDL	0.7	LDL			
10715	09-85	36				NR	NR		LDL	LDL	2.0	LDL			
10716	09-85	48				NR	NR		LDL	LDL	0.7	LDL			
10717	09-85	72				NR	NR		LDL	LDL	0.6	LDL			
(Note: 30 pCi/g of Ac-227 was detected in this sample using gamma spec.)															
10718	09-85	90				NR	NR		LDL	LDL	1.2	LDL			
(Note: 200 pCi/g of Ac-227 was detected in this sample using gamma spec.)															
10719	09-85	108				NR	NR		LDL	LDL	1.5	LDL			

5.9. AREAS OF POSSIBLE ELEVATED THORIUM ACTIVITY

Evaluation of the Site Survey Project data indicates that both isolated and contiguous areas of elevated thorium activity, above the Mound Plant guidelines of 5 (surface) and 15 (subsurface) pCi/g, may exist beyond the areas with numerical indicators. Inspection of Plate 5 suggests that low-level thorium activity may be spread to the areas northwest of Areas 8 and 9 across Area 7. Considering that the thorium project actually involved redrumming operations in Areas 7 and 9, the mechanism of contaminant transport would have been fugitive dust emissions. This is largely consistent with the distribution of thorium depicted in Plate 5. Since this region of the upper valley of the plant has undergone considerable new construction and has been paved with asphalt since the redrumming operations, the isopleth concentrations depicted in Plate 5 may now be represented by spotty contamination in actual field conditions. Samples from locations C0007, C0028, S0307, S0425 are indicated as possible hot spots on Plate 1.

Indications of elevated levels of thorium adjacent to Area 8 (Plate 5) are substantiated by samples collected since the Site Survey Project. Samples were apparently collected north and west of the fence line and south of Building 61 (Plate 1). Results reported from the Mound Plant Soil Screening Facility (MRC 1985) indicate thorium concentration that ranged from 1 to 28 pCi/g and plutonium-238 concentrations from 3 to 58 pCi/g. Approximately 24 samples were collected and analyzed, but the individual sample locations were not established for this report. The data sheets are included in Appendix E.

An area of possible elevated thorium activity is noted on Plate 1, west of Area 7. This area is located slightly uphill and to the southwest of Building 98. Table V.6 presents the results of the locations that have been included in this area. The maximum concentration of thorium reported, 37.69 pCi/g, was detected in the sample collected from core location C0011 at a depth of 18 inches. Thorium levels in excess of the Mound Plant cleanup levels (5 pCi/g for the first 15 cm of soil and 15 pCi/g for below 15 cm depth) were also measured in samples from core location C0010 and surface locations S0287 and S0288 (Table V.6).

Mound Plant drawings #FSE16472 (DOE 1992f) indicates the depth to bedrock in this area of Mound Plant is approximately 180 inches, or about 15 ft. The core locations in this area were sampled to at least 216 inches. Based on the Mound Plant drawing referenced above, it appears that the core locations in this area were sampled to bedrock, although boring logs are not available.

A second area of low-level but possibly wide-spread thorium contamination is indicated in Area 1 (Plates 1 and 5). This area was also involved with thorium storage and repackaging, but has experienced several cleanup activities, as previously described. Sample locations S0971 and S0982 (Table V.7), indicated as possible hot spots on Plate 1, may represent outlying areas of contamination associated with operations in Area 1.

Table V.7. Isolated Locations of Elevated Activity

Plate 1 Location ^a	Coordinates		MRC ID No.	Mo-Yr	Depth (inch)	Plutonium-238 (pCi/g)	Thorium ^b (pCi/g)	Tritium (pCi/mL)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)
	South	West										
C0007 ^c	1800	1860	8352	11-84	54	0.39	41.63					
			8353	11-84	108	0.08	5.14					
C0028	2375	1755	1245	12-82	18	11.40	5.61					
			1246	12-82	48	NR	109.00					
			1247	12-82	66	NR	109.00					
			1248	12-82	102	NR	58.00					
			1250	12-82	156	NR	97.00					
			1251	12-82	216	0.29	29.45					
			1252	12-82	234	0.06	b					
			1253	12-82	252	0.03	b					
S0166	1750	3350	4000	10-83	0	34.50	b					
S0175	1375	3580	9845	06-85	0	NR	NR	82	10	0.8	LDL	
S0208	1660	3765	3085	10-83	0	61.00	b	0.72				
S0307	2175	2060	2821	10-83	0	5.36	6.46					
S0425	2500	2945	4108	10-83	0	1.08	5.74					
S0472	2175	3505	6701	08-84	0	1.20	7.50					

RADIOCHEMICAL ANALYSIS

^aMap locations are given using a "C" to designate core locations and an "S" to designate surface locations.

^bA "b" indicates that the total thorium concentration was less than the background level of 2.0 pCi/g, using FIDLER screening. Therefore, radiochemical analysis was not performed.

FIDLER - field instrument for the detection of low-energy radiation

LDL - The measured concentration was below the lower detection limit, estimated to be 0.5 pCi/g for cobalt-60, cesium-137, and americium-241; and 1 pCi/g for radium-226.

MRC ID - Monsanto Research Corporation Identification

NR - No result given

pCi/g - picocuries per gram

pCi/mL - picocuries per milliliter

Environmental Restoration Program

**OPERABLE UNIT 5
OPERATIONAL AREA PHASE I INVESTIGATION
AREA 7 FIELD REPORT**

**MOUND PLANT
MIAMISBURG, OHIO**

VOLUME I - TEXT

June 1995

Final (Revision 0)

**U.S. Department of Energy
Ohio Field Office**



EG&G Mound Applied Technologies

CO12680 FRA7RAD.DWG 6/2/95

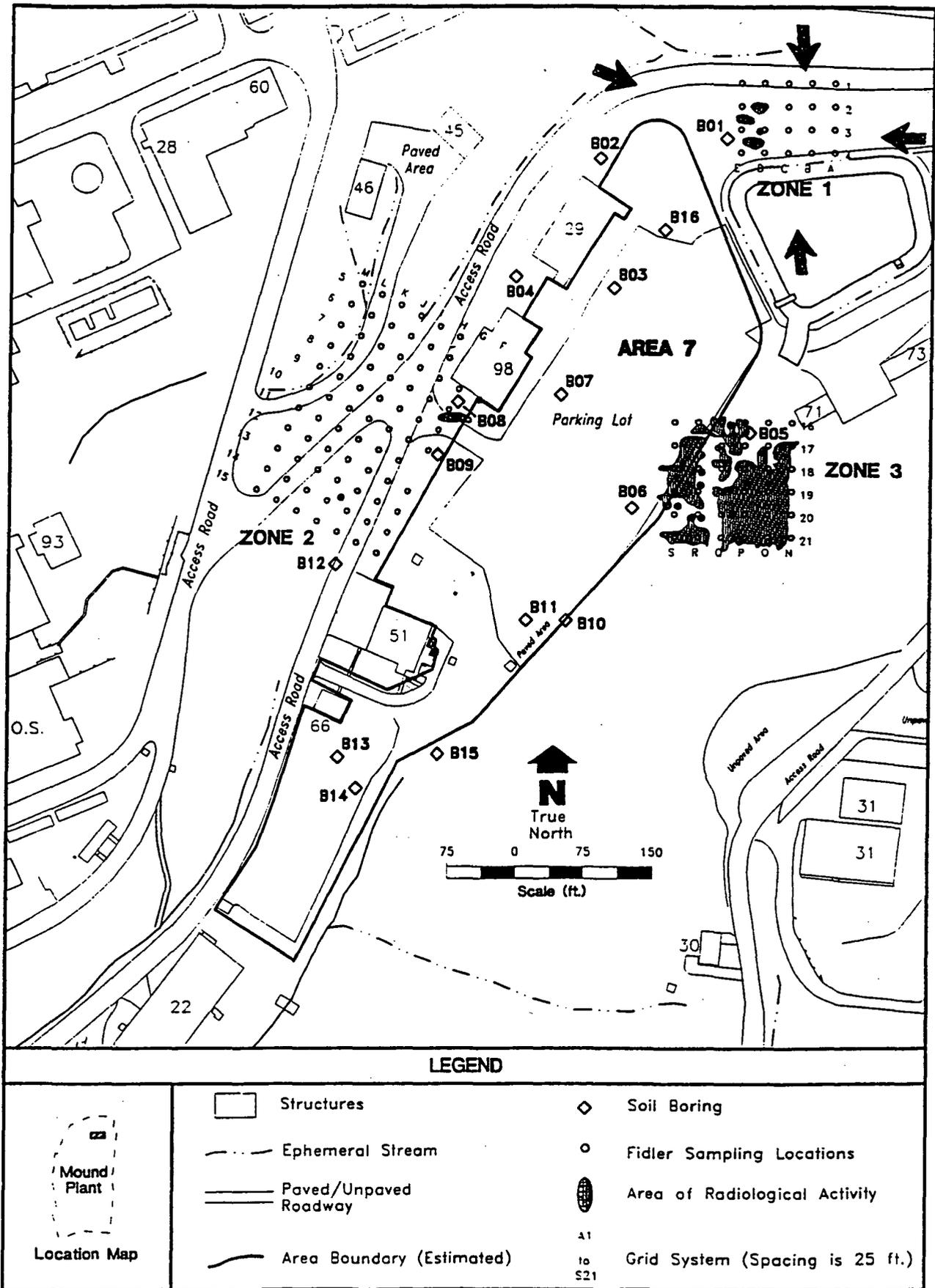


Figure 2.2. Areas of Elevated Surface Radiological Activity (FIDLER Survey)

Several small areas of elevated surface radiological activity were detected in the western side of Zone 1. In Zone 3, a large portion of the area was identified as having elevated surface radiological activity (see Figure 2.2).

2.1.4.2. Soil Screening Facility Data

Surface soil samples collected as part of the soil gas survey (see Section 2.2.1), were analyzed for Pu-238 and Th-232 at the Mound Plant Soil Screening Facility. Concentrations of Th-232 were not detected equal to or exceeding the Mound Plant Soil Screening Facility detection limit of 2.0 picocuries per gram (pCi/g). Concentrations of Pu-238 equal to or exceeding the Mound Plant Soil Screening Facility detection limit of 25 pCi/g were detected at five of the 132 sample locations. This information is summarized in Table II.3 and presented in Figure 2.3.

Table II.3. Summary of Elevated Surface Soil Radiological Activity

Grid Location*	Mound Plant Soil Screening Facility Data
	Plutonium-238 (pCi/g)
M6	28
N19	27
O21	25
P16	28
Q18	30

* See Figure 2.3 for grid locations

As Figure 2.3 indicates, there are several small locations of near surface (zero to six inches deep) Pu-238 contamination in Area 7. Most of these locations are in Zone 3. Additionally, Pu-238 activity was detected at M6 in Zone 2. The FIDLER survey did not show corresponding radiological activity at these locations.

2.2. SOIL GAS SURVEY

A soil gas survey was performed at the three outlying zones adjacent to Area 7 (see Figure 2.1.) from July 26 to August 17, 1994. The survey was conducted according to the OU5 South Property RI/FS Quality

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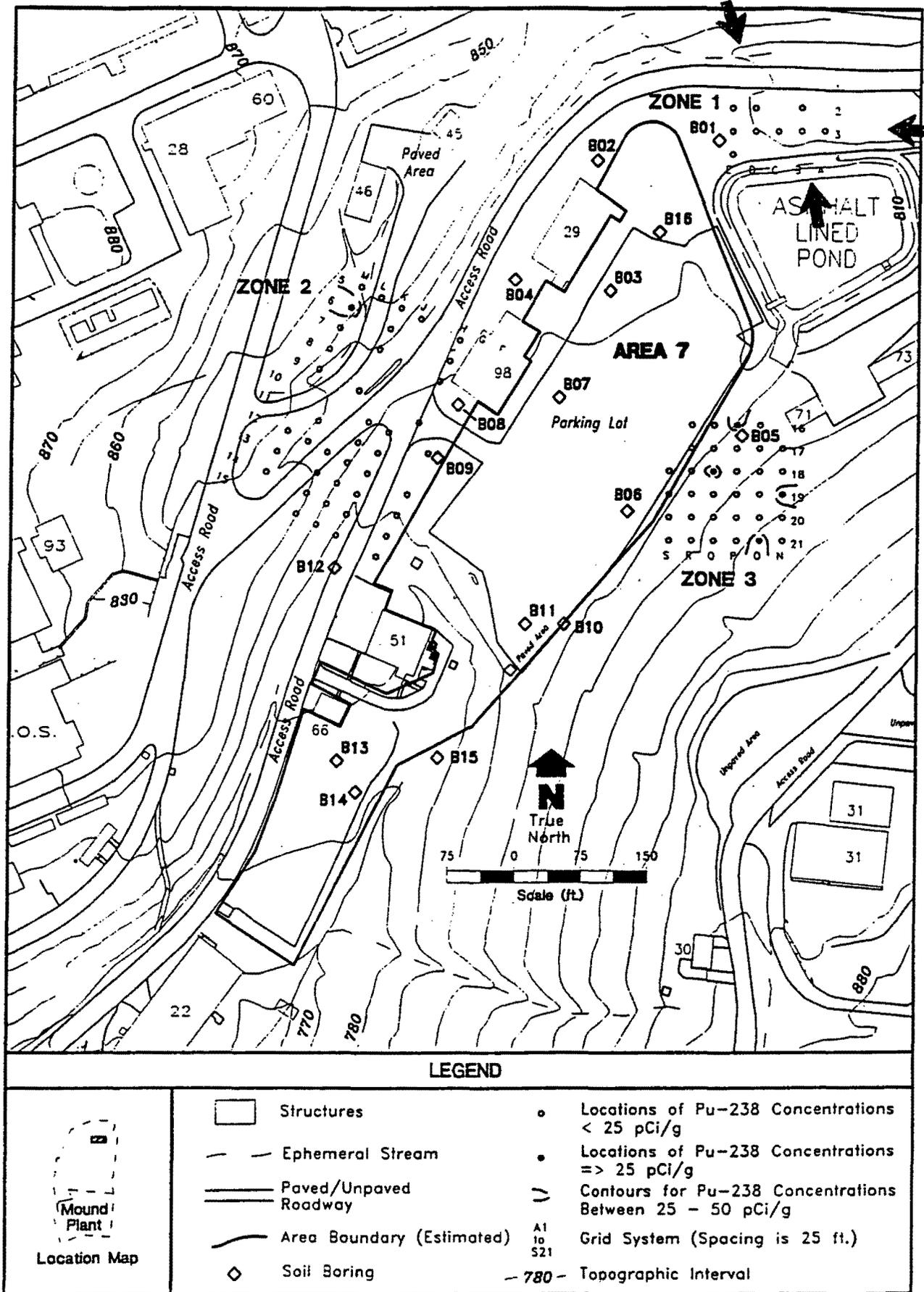


Figure 2.3. Areas of Elevated Surface Pu-238 Activity

2.2.3. Health and Safety Summary Report

The soil gas survey was conducted according to the OU5 HSP and the Environmental Restoration Program Site-Specific Health and Safety Plan for OU5 Operational Area - Area 7. Soil gas locations were screened using a FIDLER to avoid digging in radioactively contaminated soil. Sampling locations were checked for underground utilities to avoid damaging utility lines while digging. Health and safety issues were discussed and resolved during tailgate safety briefings conducted by the Site Health and Safety Officer and documented in the Site Manager logbook (Appendix A.2). No health and safety violations occurred during the soil gas survey.

2.2.4. Presentation of Soil Gas Data

The Petrex Soil Gas Survey Report is presented in Appendix D. The report discusses the Petrex method, the scope of work, quality assurance/quality control methods, and results. Plates 1 through 5 in Appendix D show sample locations and significant ion counts of targeted compounds. Ion count values are the unit of measure assigned by the mass spectrometer to the relative intensities associated with each compound. These relative intensity levels do not represent actual concentrations. The Petrex soil gas method is considered qualitative and cannot differentiate between multiple contaminant sources in soil and/or groundwater.

The Petrex soil gas survey was conducted at three small outlying zones adjacent to Area 7, as shown on Figure 1.2 and Plate 1 in Appendix D. Zone 1 contained 20 sampling locations, Zone 2 contained 76 sampling locations, and Zone 3 contained 36 sampling locations.

Based on a review of historical information for Area 7 and the immediate vicinity, NERI was directed to analyze the soil gas samples for the following four general classes of compounds:

- total aromatic hydrocarbons,
- total semi-volatile hydrocarbons,
- total C₅ to C₁₁ petroleum hydrocarbons, and
- total halogenated hydrocarbons.

The following subsections describe the distribution of the compounds listed above. A summary of soil gas findings is presented in Section 3.

2.2.4.1. Distribution of Total Aromatic Hydrocarbons

Total aromatic hydrocarbons are reported as the combined levels of C₆ to C₁₅ aromatic (benzene based) hydrocarbon compounds detected in the soil gas samples. Most of the samples contained the lighter weight (C₆ through C₁₀) aromatics. Few samples were observed to contain C₁₁ and heavier aromatics.

The distribution of aromatic hydrocarbons in Area 7 is shown in Appendix D, Plate 2. In Zone 1, elevated relative levels of aromatics were found in soil gas mostly along the access road to the north. There are two isolated sampling points near the asphalt-lined pond which also showed elevated relative levels of aromatics. Several of the samples showed high relative levels of an assortment of hydrocarbons (not just aromatics) which are characteristic of vapor from weathered medium to heavy weight fuels or heating oils.

Zone 2 shows the greatest presence of aromatics. Elevated relative levels were found in several large sections covering most of the area, which correlate to the asphalt roads that cross Zone 2. Aromatics in the soil gas in the southern portion of Zone 2 are mixed with other hydrocarbons, which together are characteristic of vapor from weathered light to medium weight fuels. Aromatics in the soil gas in the northern portion of Zone 2 are combined with other hydrocarbons, which together are characteristic of heavier fuels.

Elevated relative levels of aromatics in Zone 3 were found only in samples R18 and O20. The aromatics from sample O20 occurred with high levels of naphthalene and methylnaphthalene. This suggests the presence in the subsurface of semi-volatile polycyclic compounds such as coal tar, creosote, or heavy fuel oils.

A variety of aromatic hydrocarbons (C₆ - C₁₀) were confirmed on samplers J7, I8, I9, C2, and H10 by Thermal Desorption-Gas Chromatograph/Mass Spectrometry (TD-GC/MS). These results are presented in Appendix D.

2.2.4.2. Distribution of Total Semi-volatile Hydrocarbons

Total semi-volatile hydrocarbons are reported as the combined response to naphthalene; C₁₁ through C₁₅ alkyl naphthalenes; and C₁₂, C₁₄, and C₁₆ polycyclic hydrocarbons. These compounds are constituents of creosote, coal tar, and other heavy, high boiling point fraction petroleum products. Naphthalene, and C₁₁ and C₁₂ alkyl naphthalenes (e.g. methylnaphthalene and ethyl- or dimethylnaphthalene) may also be found in medium to heavy weight fuels and fuel oils.

The distribution of semi-volatiles is shown in Appendix D, Plate 3. Within Zone 1, four samples (A4, C2, D4, and E1) showed elevated relative response to semi-volatiles in the soil gas. Of these, only sample C2 demonstrated a high relative level of a C₁₄ compound. Analysis of C2 by TD-GC/MS did not confirm the presence of a C₁₄ polycyclic compound (see Appendix D). Semi-volatiles in samples A4, D4, and E1 occurred with various medium to heavy hydrocarbons typical of vapor from medium to heavy weight fuel or fuel oil.

Zone 2 shows elevated relative responses to semi-volatiles, mostly in two locations along the main access road. Semi-volatile compounds in these areas were combined with high relative levels of other petroleum hydrocarbons common in medium to heavy weight fuels or fuel oils. Elevated relative levels of naphthalene and dihydro-1H-indene were detected in the soil gas from sample J14 in the near absence of other petroleum hydrocarbons. This suggests that heavy weight petroleum products, particularly coal tar products, may be present in the subsurface.

Four samples in Zone 3 (N21, O20, R18, and R21) showed elevated relative responses to semi-volatile compounds. The higher relative responses, mostly naphthalene and methylnaphthalene, were found in samples O20 and R21. The presence of naphthalenes in O20 was confirmed by TD-GC/MS (see Appendix D). In these two samples, the naphthalenes were found in the near absence of aromatics and other light to medium weight petroleum hydrocarbons. In samples N21 and R18, naphthalenes were also found with other petroleum hydrocarbons.

2.2.4.3. Distribution of Total C₅ to C₁₁ Petroleum Hydrocarbons

Total C₅ to C₁₁ petroleum hydrocarbons reported include alkanes, alkenes, cycloalkenes, dienes (referred to collectively as aliphatics), plus aromatic and naphthalenic compounds. In various combinations, these

compounds make up the bulk of most common petroleum fuels, oils, and lubricants. Total C₅ to C₁₁ petroleum hydrocarbons are reported to best illustrate petroleum product vapor of which aromatic and semi-volatile compounds may not be prominent components.

The distribution of total C₅ to C₁₁ petroleum hydrocarbons is shown in Appendix D, Plate 4. In Zone 1, high relative levels of petroleum hydrocarbons were found to the north near the access road. In addition, there are two sampling locations (A4 and D4) to the south along the asphalt-lined pond which also showed response to petroleum hydrocarbons. Analysis of sample C2 by TD-GC/MS confirmed the presence of alkanes and cycloalkanes (see Appendix D). Compounds found in samples from Zone 1 are typical of vapor derived from weathered heavy weight fuels or fuel oils. The prominence of heavy semi-volatile compounds in these samples suggest that coal tar may also be present in the subsurface.

Zone 2 shows the highest relative response to petroleum hydrocarbons. Elevated relative levels of a broad assortment of petroleum hydrocarbons occur mostly in several areas as elongated lobes roughly paralleling the asphalt roads in Area 7. Analysis of samples H10, I8, I9, and J7 by TD-GC/MS verified the presence of alkanes and cycloalkanes (see Appendix D). The compounds in these lobes are typical of vapor derived from weathered medium to heavy weight fuels.

In Zone 3, elevated relative levels of petroleum hydrocarbons were found in samples O20 and R18. In sample O20, these hydrocarbons included particularly high relative levels of naphthalenic compounds characteristic of a coal tar product. The presence of naphthalenics in sample O20 was confirmed by TD-GC/MS. In sample R18, elevated relative levels of petroleum hydrocarbons included many heavy weight compounds and the semi-volatile compound methyl-naphthalene.

2.2.4.4. Distribution of Total Halogenated Hydrocarbons

Total halogenated hydrocarbons are reported as the combined levels of PCE, trichloroethene (TCE), trichloroethane (TCA), dichloromethane, trichlorofluoromethane (Freon-11), trichlorotrifluoroethane (Freon-113), chlorobenzene, dichlorobenzene (DCB), and a monobromo-C₇ hydrocarbon. Most of these compounds are used primarily as solvents and cleaning agents. The freons may also have been used as refrigerants. The precise identity and use of the brominated hydrocarbon is currently unknown.

The distribution of halogenated hydrocarbons in Area 7 is shown in Appendix D, Plate 5. PCE was detected more frequently in the soil gas than were the other halogenated organics. Thus, elevated relative responses to halogenated hydrocarbons shown in Appendix D, Plate 5, principally reflect the presence of PCE. However, PCE was not confirmed in samples I8, I9, and H10 when analyzed by TD-GC/MS. Additionally, exceptions to this were the detections of dichloromethane in sample K14, chlorobenzene in sample Q17, and the brominated hydrocarbon in samples J6 and J12.

In Zone 1, only low relative levels of halogenated hydrocarbons were detected. Since these levels are below the relative ion count chosen for contouring, they were not plotted.

In Zone 2, several areas demonstrated elevated relative levels of halogenated hydrocarbons, including dichloromethane and the brominated hydrocarbon previously mentioned. The distribution of these compounds does not appear to be associated with access roads or buildings. These areas show a slight east-west elongation and are found to the north and along the western and southern edge of Zone 2.

In Zone 3, there are two areas of elevated relative levels of halogenated hydrocarbons. Sample Q17 shows a pronounced occurrence of chlorobenzene. Lower levels of a mixture of halogenated compounds were detected close to Q17 and to the south from sample Q20.

2.3. SOIL BORINGS

Sixteen soil borings were drilled in Area 7 from June 20 to July 27, 1994, as part of the Phase 2 investigation. A hollow-stem auger drill rig was used to advance the borings through unconsolidated material until bedrock was encountered. Soil and groundwater samples were collected for radiological, chemical, and geotechnical parameter analysis, per the OU5 Work Plan and the OU5 QAPjP Data Quality Objectives (DQOs).

As specified in the OU5 FSP, objectives of Phase 2 activities at Area 7 include:

- evaluate groundwater contamination downgradient of Area 7 by utilizing the existing OU9 wells;

3. SUMMARY

The results of Area 7 Phase 1/Phase 2 activities are summarized in this section.

3.1. FIDLER SURVEY SUMMARY

The FIDLER survey detected several areas of elevated surface radiological activity. The areas were located in Zone 2 south of Building 98, in the western portion of Zone 1, and in a large portion of Zone 3.

Data from the Mound Plant Soil Screening Facility indicate that no surface soil samples collected from the 132 sampling locations showed Th-232 concentrations at or exceeding 2 pCi/g. Five samples had Pu-238 concentrations at or exceeding 25 pCi/g. Four of the samples were from Zone 3 and the remaining sample was from Zone 2.

3.2. SOIL GAS SURVEY SUMMARY

Zone 2 showed the most elevated relative responses to the four general compound classes, particularly total C₅ to C₁₁ petroleum hydrocarbons. Except for total halogenated hydrocarbons, elevated relative responses to the other three compound classes generally occurred along the asphalt roads crossing Zone 2. Zone 1 showed no elevated relative response to total halogenated hydrocarbons. Zone 3 showed elevated relative responses to all four compound classes.

Of the halogenated hydrocarbons, PCE was most frequently detected. Thus, most of the responses to halogenated hydrocarbons comes from the presence of PCE in the soil gas.

Most of the soil gas samples showed low to moderate relative levels of C₄ to C₁₀ petroleum hydrocarbons. These compounds belong to alkanes, cycloalkenes, alkenes, cycloalkenes, dienes, aromatics, styrenes, and naphthalenes. They are common constituents of most petroleum fuels, heating oils, light lubricating oils, and many other petroleum hydrocarbon products.

A few of the samples showed moderate to high relative levels of petroleum hydrocarbons which range up to C₁₅ in weight. Two compositional characters were apparent in these heavier hydrocarbons. The first

Methodology and analytical results are presented in the Reconnaissance Sampling Report, Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (DOE 1993g).

Environmental Restoration Program Remedial Investigation

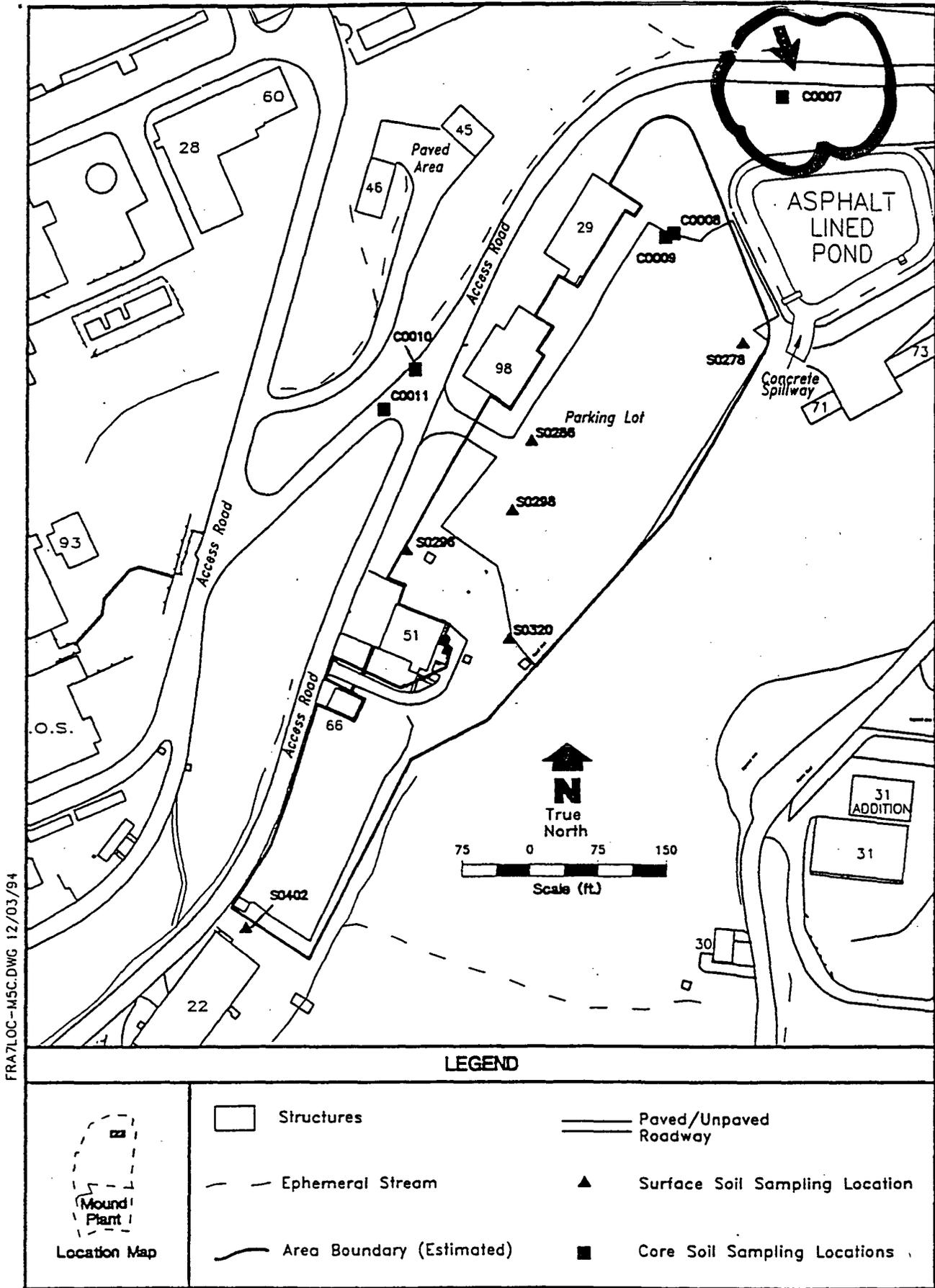
Three monitoring wells (0111, 0112, 0318) were installed in and near Area 7 and sampled during the Environmental Restoration (ER) Program Remedial Investigation. These wells were added to the ER Program Groundwater Monitoring Network and groundwater samples were collected periodically per the RI/FS OU9 Site-Wide Work Plan (DOE 1992a). These wells were also sampled during the Spring of 1993 and the Fall of 1994 Sweeps Program. However, the resultant validated analytical data are currently being reviewed and were not used in this report.

Methodology and analytical results are presented in the OU9 Site Scoping Report Volume 1, Groundwater Data: February 1987 - July 1990 and Addendum (DOE 1992b); the Groundwater Water and Seep Water Quality Data Report Through First Quarter, FY92 (DOE 1992c); and Groundwater Monitoring and Mapping Results for March, 1993 (DOE 1993h).

OU9 Hydrogeologic Investigation

Two monitoring wells (0322 and 0395) and a bedrock boring (0384) were installed and sampled during the OU9 Hydrogeologic Investigation. Surface and subsurface soil samples were collected during installation of the wells and subsurface soil samples were collected from the bedrock boring. Methodology and analytical results are presented in the OU9 Hydrogeologic Investigation: Soil Chemistry Report (DOE 1994a). Groundwater samples were also collected from the wells during the Spring of 1993 and the Fall of 1994 Sweeps Program. However, the resultant validated analytical data from the Sweeps Program are currently being reviewed and were not used in this report.

The following subsections present historical data per media and contaminant (e.g., surface soil radiological data, surface soil chemical data, etc). Historical data is then compared, as appropriate, to the summaries from this investigation, as presented in Section 3. Generally, this comparison illustrates which contaminants, if any, are common to historical and current investigations.



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Figure 4.1. Location of Surface and Core Soil Samples from the Mound Site Survey Project

Other radionuclides detected in surface soil samples included Ra-226 (maximum concentration of 2.0 pCi/g), Cs-137 (maximum concentration of 1.2 pCi/g), and tritium (maximum concentration of 5230 pCi/g).

Surface soil samples from installation of wells 0322 and 0395 were collected during the OU9 Hydrogeologic Investigation. No surface soil samples were collected from well 0318 or boring 0384. Well locations are shown on Figure 4.2. These samples were analyzed for a wide range of radionuclides, as shown in Table IV.2. Pu-238 was detected at 0.52 pCi/g from well 0395 and 0.193 pCi/g from well 0322. Total thorium (sum of Th-228, Th-230, and Th-232) concentrations were 5.78 pCi/g from well 0395 and 2.71 pCi/g from well 0322. K-40 was detected at 29.6 pCi/g from well 0322 and 22.8 pCi/g from well 0395. Ra-226, Cs-137, and tritium were also detected in surface soil samples from these wells but all at concentrations less than 1.0 pCi/g.

4.1.2. Comparison of Historical Surface Soil Radiological Data to Phase 1 and Phase 2 Data

Historical data from Area 7 suggest that surface radiological contamination is localized. The highest Pu-238 concentration was found near Building 98 at 7.40 pCi/g and the highest thorium concentration was 20.52 pCi/g in the south central portion of the parking lot. This is consistent with the FIDLER survey from this investigation which detected one small area of possible surface radiological contamination west of Building 98.

It should be noted that historical sampling events occurred within the boundaries of Area 7 and the FIDLER survey was conducted over three zones outside the boundary of Area 7. However, a FIDLER survey was also conducted for the Non-AOC Field Report (DOE 1994b) with approximately 30 of the grid points, spaced 100 feet apart, near or within the Area 7 boundary. No FIDLER readings above contamination criteria were noted at these locations.

In addition to these FIDLER surveys, surface samples were collected during this investigation for analysis of Pu-238 and Th-232 at the Mound Plant Soil Screening Facility. These data are summarized in Table II.3 and discussed in Sections 2.1.4.2 and 3.1. Th-232 was not detected at concentrations equal to or exceeding 2.0 pCi/g. Pu-238 at concentrations equal to or exceeding 25 pCi/g were detected at five grid locations (see Figure 2.3). Four of the locations were in Zone 3 and the remaining location was in Zone 2. Neither of these radionuclides were detected in surface soil samples collected within the boundary of

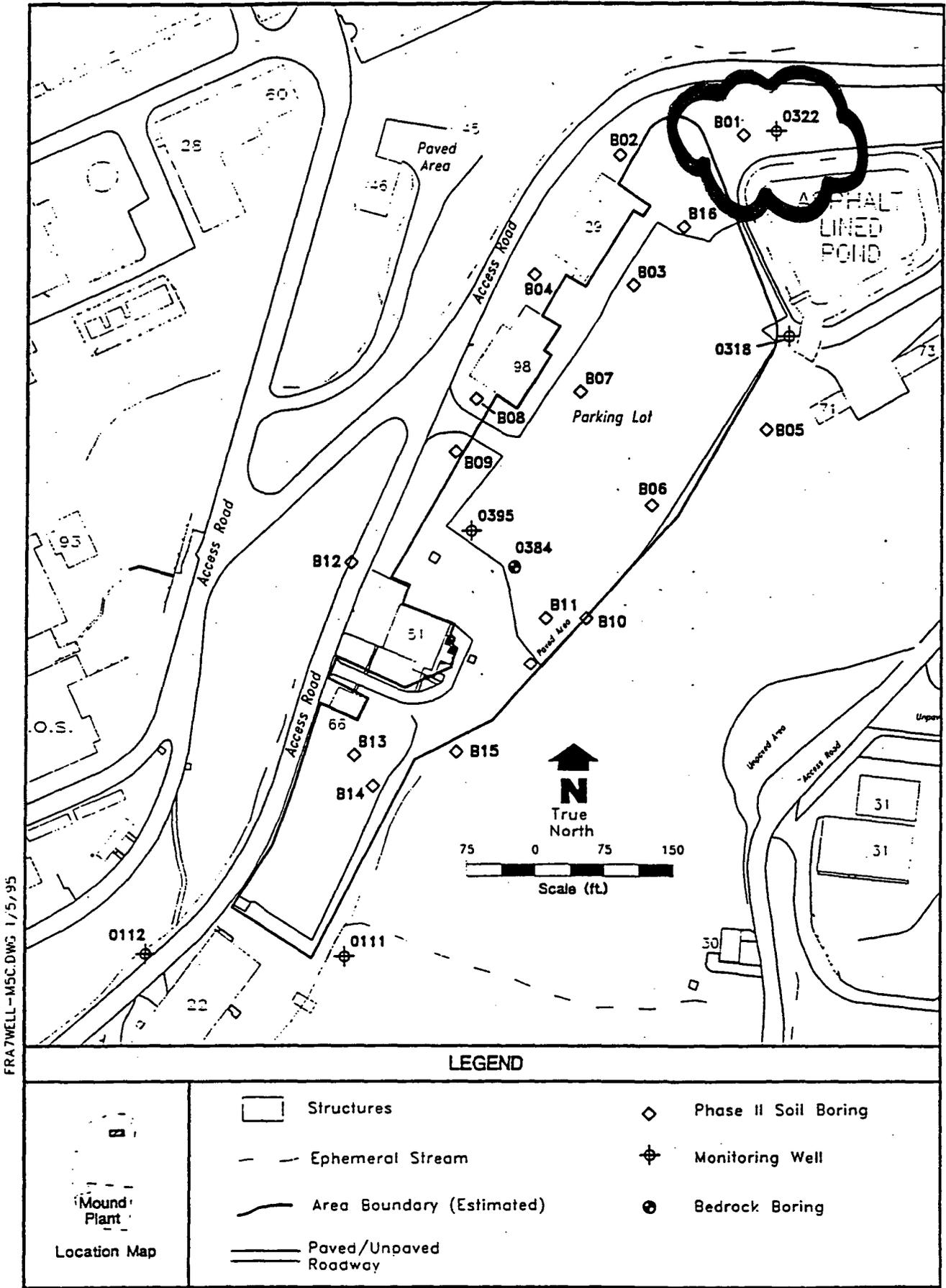


Figure 4.2. Monitoring Wells and Bedrock Borings in Area 7

Table IV.2. Historical Surface Soil Samples/Radionuclide Analysis

Analyte	Well 0322	Well 0395
	Concentration (pCi/g)	Concentration (pCi/g)
Americium-241	0.0376	ND
Cesium-137	0.094	ND
Plutonium-238	0.193	0.52
Plutonium-239/240	0.0133	ND
Potassium-40	29.6	22.8
Radium-226	0.966	0.769
Thorium-228	1.12	2.11
Thorium-230	0.92	1.81
Thorium-232	0.667	1.86
Tritium	0.944	0.432
Uranium-234	0.747	0.96
Uranium-235/236	0.0441	0.0369
Uranium-238	0.776	0.877

Source OU9 Hydrogeologic Investigation: Soil Chemistry Report (Rev. 1, September 1994)

ND not detected

pCi/g picocuries per gram

Area 7 during the Non-AOC reconnaissance investigation discussed above. These findings are also consistent with historical sampling events suggesting a few localized areas of surface radiological contamination.

Surface soil samples were collected at each of the 16 soil borings installed in Area 7 during this investigation and analyzed for various radionuclides, as summarized in Table III.1 in Section 3. The average concentration of all radionuclides, except K-40 and tritium, is less than 0.70 pCi/g, which is consistent with historical data suggesting minimal surface radiological contamination. The average K-40 and tritium concentrations were 16.14 pCi/g and 5.05 pCi/g, respectively.

The highest concentration in surface soil samples was K-40 at 23.72 pCi/g from boring B06. The highest concentrations of Pu-238 and total thorium (sum of Th-228, Th-230, and Th-232 isotopes) were from boring B07 at 1.36 pCi/g and from B05 at 3.27 pCi/g, respectively.

Of the remaining radionuclides detected by historical sampling events (Ra-226, Cs-137, and tritium), Ra-226 and tritium were detected in surface soil samples from Area 7 borings. The maximum Ra-226 concentration was 0.83 pCi/g from B16, and the maximum tritium concentration was 9.50 pCi/g from B09.

4.2. SURFACE SOIL CHEMICAL DATA

The following subsections present historical surface soil chemical data and compare them to Phase 2 data from this investigation.

4.2.1. Presentation of Historical Surface Soil Chemical Data

Surface soil samples from monitoring wells 0322 and 0395 (see Figure 4.2) were collected during the OU9 Hydrogeologic Investigation and analyzed for organic and inorganic constituents.

4.2.1.1. Historical Surface Soil Organic Data

Several VOCs and/or SVOCs were found in surface soil samples from wells 0322 and 0395. Table IV.3 presents a summary of organic surface soil contaminants detected from these two historical Area 7 monitoring wells.

Table IV.3. Historical Surface Soil Samples/VOC and SVOC Analysis

Analyte	Well 0322	Well 0395
	Value (ppb)	Value (ppb)
VOCs		
2-Hexanone	13J	ND
4-Methyl-2-Pentanone	9.0J	ND
Acrylonitrile	4.0J	ND
SVOCs		
Acenaphthene	ND	120J
Acenaphthylene	ND	85J
Anthracene	ND	230J
Benzo(a)Anthracene	ND	560
Benzo(a)Pyrene	ND	600
Benzo(b)Fluoranthene	ND	540
Benzo(k)Fluoranthene	ND	510
Benzo(g,h,i)Perylene	ND	410
Bis(2-ethylhexy)phthalate	ND	40J
Carbozle	ND	96J
Chrysene	43J	560
Dibenzo(a,h)Anthracene	ND	140J
Dibenzofuran	ND	92J
Fluoranthene	110J	1300
Fluorene	ND	180J
Indeno(1,2,3-cd)Pyrene	ND	390
Phenanthrene	91J	750
Pyrene	130J	1000

Source: OU9 Hydrogeologic Investigation: Soil Chemistry Report (DOE 1994a)

ND not detected
 J estimated value
 ppb parts per billion

No VOCs were found at well 0395. 2-Hexanone, 4-methyl-2-pentanone, and acrylonitrile were VOCs detected at well 0322. There were more SVOCs detected at well 0395 than at well 0322. Chrysene, fluoranthene, phenanthrene, and pyrene were SVOCs common to both wells, but in all cases detected at lower concentrations at well 0322.

4.2.1.2. Historical Surface Soil Inorganic Data

Table IV.4 presents a summary of metals detected in surface soil samples from historical borings. Aluminum and potassium were detected in surface soil samples from well 0322 at concentrations of 13,100 ppm and 2,590 ppm, respectively. Barium, lead, and zinc were detected in samples from well 0395 at concentrations of 49.4 ppm, 11.9 ppm, and 63J ppm, respectively.

Table IV.4. Historical Surface Soil Samples/Metals Analysis

Analyte	Well 0322	Well 0395
	Value (ppb)	Value (ppb)
Aluminum	13,100	ND
Barium	ND	49.4
Lead	ND	11.9
Potassium	2,590	ND
Zinc	ND	63J

Source: OU9 Hydrogeologic Investigation: Soil Chemistry Report (DOE 1994a)

ND not detected
 J estimated value
 ppb parts per billion

4.2.2. Comparison of Historical Surface Soil Chemical Data to Phase 2 Data

Historical data indicates the presence of some surface soil chemical contaminants, primarily VOCs and SVOCs, with some metals as summarized in Tables IV.3 and IV.4. The following subsections compare historical data to Phase 2 data collected during this investigation.

4.2.2.1. Comparison of Surface Soil Organic Data

Surface soil samples from Phase 2 borings B01 through B15 were analyzed for VOCs and SVOCs, as discussed in Section 3.3.1.2. Comparison of VOC data is inconclusive. None of the three VOCs found in well 0322 (2-hexanone, 4-methyl-2-pentanone, and acrylonitrile) were detected in surface soil samples from Area 7 borings. Neither of the VOCs found in Area 7 borings (acetone and hexane) were found in subsurface soil samples from either historical well.

Comparison of SVOCs detected in historical and current investigations is fairly consistent. Chrysene, fluoranthene, phenanthrene, and pyrene are SVOCs that were found in surface soil samples from both historical wells 0322 and 0395, and also were found in most of the surface soil samples from Phase 2 soil borings with the following exceptions. Chrysene was not detected in B06 and B10, and phenanthrene and pyrene were not detected in B10.

As discussed in Section 3.3.1.2, Phase 2 soil boring B09 showed most SVOC maximum concentrations in surface soil samples, including the four SVOCs discussed above. B09 is located near well 0395 (see Figure 4.2), which also shows corresponding high SVOC concentrations in surface soil samples.

4.2.2.2. Comparison of Surface Soil Inorganic Data

Metals were consistently detected during historical and current investigations in Area 7. Each of the metals detected in surface soil samples from historical wells 0322 and 0395 (aluminum, barium, lead, potassium, and zinc) were also detected in all 15 of the surface soil samples collected from Area 7 soil borings. Samples from the two historical wells were not analyzed for anions or lanthanides. Therefore, no comparison with these parameters is possible.

4.3. SUBSURFACE SOIL RADIOLOGICAL DATA

The following subsections present historical subsurface soil radiological data and compare them to Phase 2 data from this investigation.

4.3.1. Presentation of Historical Subsurface Soil Radiological Data

During the Mound Site Survey Project, Ac-227 was found in samples from core locations 0008 and 0009, near the suspected location of the septic tank (see Figure 4.1). The maximum concentration of 1,400 pCi/g was found in core 0008 at a depth of 12.0 feet BGS with high concentrations reaching a depth of 18.0 feet BGS. 200 pCi/g of Ac-227 was found in core 0009 at a depth of 7.5 feet BGS.

The maximum Pu-238 concentration was 8.97 pCi/g at a depth of 1.5 feet BGS from core 0011. This core is located west of the parking lot in Zone 2 which is designated as an area of "Possible Elevated Thorium" (DOE 1992a).

The maximum subsurface total thorium concentration was 41.63 pCi/g at a depth of 4.5 feet BGS. This was found in core 0007 in Zone 1 north of the asphalt-lined pond. Other significant levels of total thorium detected include 37.69 pCi/g from core 0011 at a depth of 1.5 feet BGS and 27.83 pCi/g from core 0010 at a depth of 9.0 feet BGS. These two cores are located in Zone 2 which is designated as an area of "Possible Elevated Thorium".

Subsurface soil samples from two wells (0322 and 0395) and a boring (0384) in Area 7 were collected during the OU9 Hydrogeologic Investigation (see Figure 4.2). These samples were analyzed for a wide range of radionuclides, as shown in Table IV.5.

The highest Pu-238 concentration of 1.73 pCi/g was from well 0395 at a depth of 30-35 feet BGS. Pu-238 was detected in boring 0384 at 0.563 pCi/g from 2-4 feet BGS and in well 0322 at 0.0686 pCi/g from 5-10 feet BGS.

The maximum total thorium concentration of 6.69 pCi/g was detected in boring 0384 at a depth of 13-14.5 feet BGS. Total thorium was detected in well 0322 at 4.44 pCi/g from 35-40 feet BGS and in well 0395 at 3.78 pCi/g from 10-15 feet BGS.

4.3.2. Comparison of Historical Subsurface Soil Radiological Data to Phase 2 Data

Historical sampling events suggest some subsurface soil radiological contamination in Area 7. As discussed above, Ac-227 was found at a maximum concentration of 1,400 pCi/g from core 0008 at a depth

Table IV.5. Historical Subsurface Soil Samples/Radionuclide Analysis

Analyte	Monitoring Well 0322				Bedrock Boring 0384				Monitoring Well 0395			
	Maximum (pCi/g)	Depth (feet)	Minimum (pCi/g)	Depth (feet)	Maximum (pCi/g)	Depth (feet)	Minimum (pCi/g)	Depth (feet)	Maximum (pCi/g)	Depth (feet)	Minimum (pCi/g)	Depth (feet)
Cs-137	ND	ND	ND	ND	0.643	13-14.5	0.643	13-14.5	0.264	10-15	0.175	15-20
Pu-238	0.0686	5-10	0.0285	40-45	0.563	2-4	0.108	6-8	1.73	30-35	0.0449	80-85
Pu-239/240	0.0348	10-15	0.0136	20-25	0.125	2-4	0.0929	6-8	0.054	15-20	0.054	15-20
K-40	40.1	45-50	12.2	20-25	43.6	27-28	23.8	2-4	36.4	30-35	11.8	35-40
Ra-226	1.11	20-25	0.834	40-45	0.983	6-8	0.823	2-4	12.3	60-65	0.744	25-30
Sr-90	ND	ND	ND	ND	0.88	13-14.5	0.485	27-28	0.51	10-15	0.485	50-55
Th-228	1.38	45-50	0.395	30-35	2.77	13-14.5	0.786	6-8	1.01	75-80	0.465	70-75
Th-230	2.69	35-40	0.532	40-45	1.47	13-14.5	0.436	16-17	1.91	10-15	0.555	45-50
Th-232	.863	40-45	0.261	25-30	2.45	13-14.5	0.614	6-8	1.1	85-90	0.243	35-40
Tritium	1.73	5-10	0.243	10-15	1.15	13-14.5	0.253	6-8	1.44	80-85	0.076	55-60
U-234	0.955	35-40	0.716	40-45	1.12	6-8 13-14.5	0.671	16-17	1.02	50-55	0.555	25-30
U-235/236	0.0538	20-25	0.0202	45-50	ND	ND	ND	ND	0.0912	30-35	0.0259	80-85
U-238	1.03	20-25	0.753	40-45	1.06	6-8	0.775	16-17	1.08	75-80	0.594	5-10

Source: OU9 Hydrogeologic Investigation: Soil Chemistry Report (DOE 1994a)
 ND not detected
 pCi/g picocuries per gram

of 12 feet BGS. Pu-238 was found at a maximum concentration of 8.97 pCi/g at a depth of 1.5 feet BGS from core 0011 and thorium was found at a maximum concentration of 41.63 pCi/g at a depth of 4.5 feet BGS from core 0007.

Subsurface soil samples were collected at each of the 16 soil borings installed in Area 7 during this investigation and analyzed for various radionuclides, as summarized in Table III.6, Section 3. Ac-227 was detected only in B16 at a maximum concentration of 44.68 pCi/g from a depth of 15-18 feet BGS. B16 is located close to core 0008 (see Figure 4.2) and though Ac-227 concentrations are much lower in B16 than in core 0008, it was found at about the same depths in both borings. In Area 7, Ac-227 was found in three borings (B16, core 0008, and core 0009) located in one area, suggesting it is not widespread in the Area 7 subsurface.

Pu-238 was detected in subsurface soil samples from seven of the Phase 2 soil borings (B01, B07, B11, B13, B14, B15, and B16). The maximum subsurface Pu-238 concentration was 2.98 pCi/g from B14 at a depth of 25-30 feet BGS, and the average Pu-238 concentration for all subsurface soil samples was 0.62 pCi/g. These data are consistent with historical data which suggest Pu-238 contamination is widely dispersed at low levels in the Area 7 subsurface.

The average subsurface total thorium concentration was 1.76 pCi/g and the maximum subsurface total thorium concentration was 5.32 pCi/g from B07 at a depth of 15-17 feet BGS. Other total thorium concentrations greater than 2.0 pCi/g include 4.31 pCi/g from B16 at a depth of 5-7 feet BGS, 3.36 pCi/g from B14 at a depth of 25-30 feet BGS, and 2.86 pCi/g from B03 at a depth of 25-28 feet BGS. These data are consistent with historical data which suggests that total thorium in the subsurface is fairly widely dispersed and generally is found at concentrations slightly less than 2 pCi/g.

4.4. SUBSURFACE SOIL CHEMICAL DATA

The following subsections present historical subsurface soil chemical data and compare them to Phase 1/Phase 2 data from this investigation.

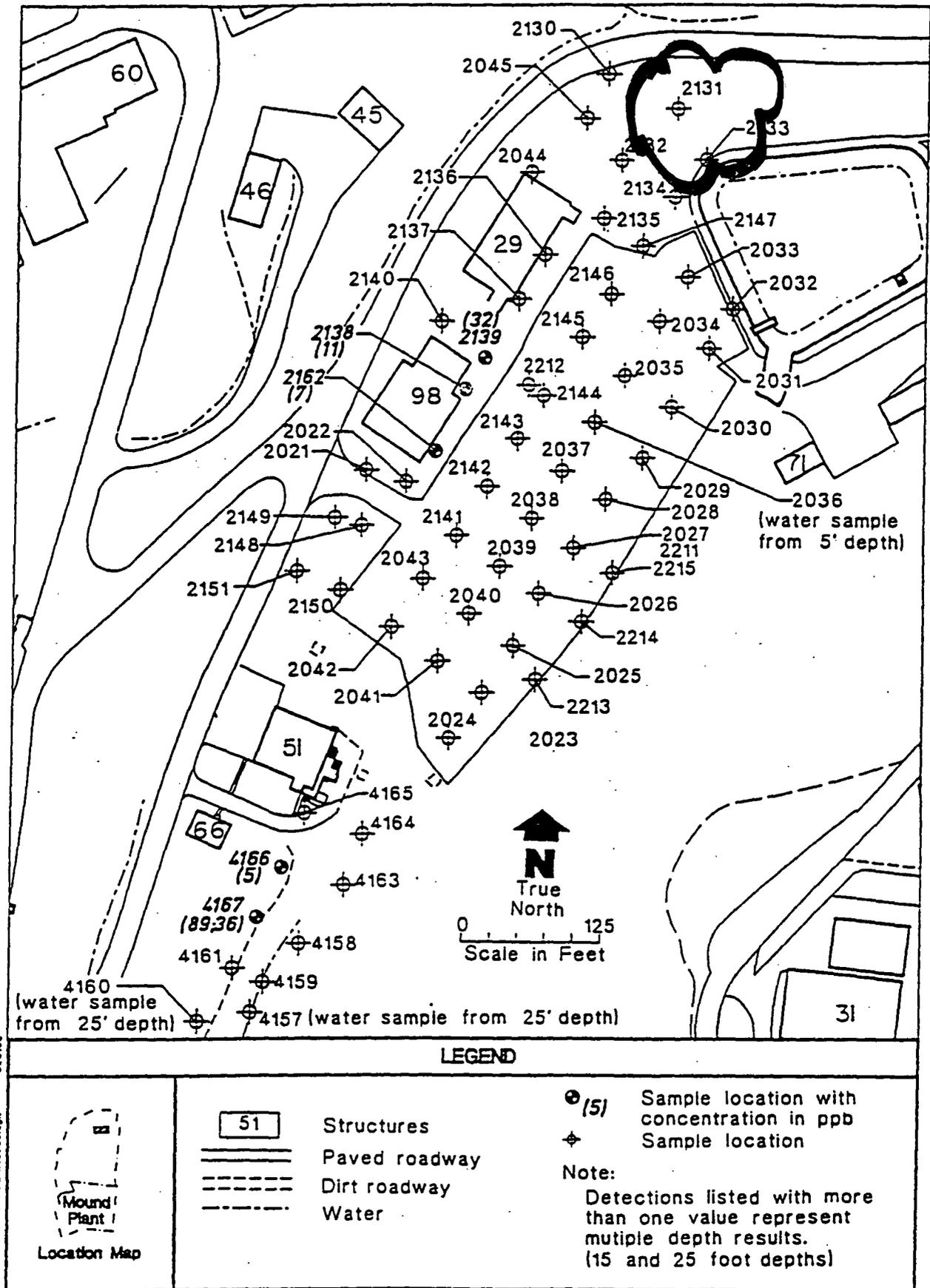


Figure 4.3. Freon-11 Detection Map for Area 7 from 1992 Soil Gas Survey

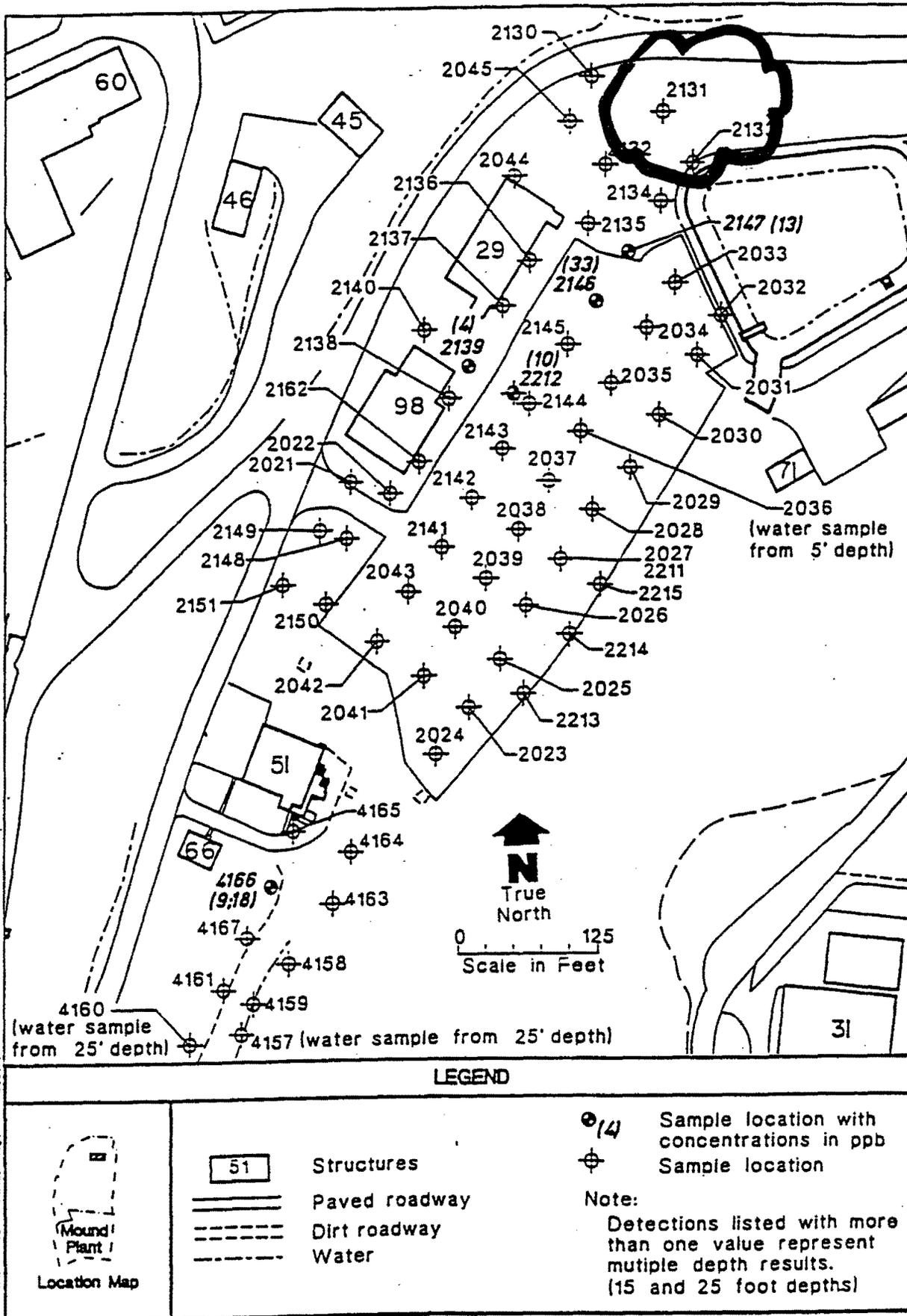


Figure 4.4. Freon-113 Detection Map for Area 7 from 1992 Soil Gas Survey

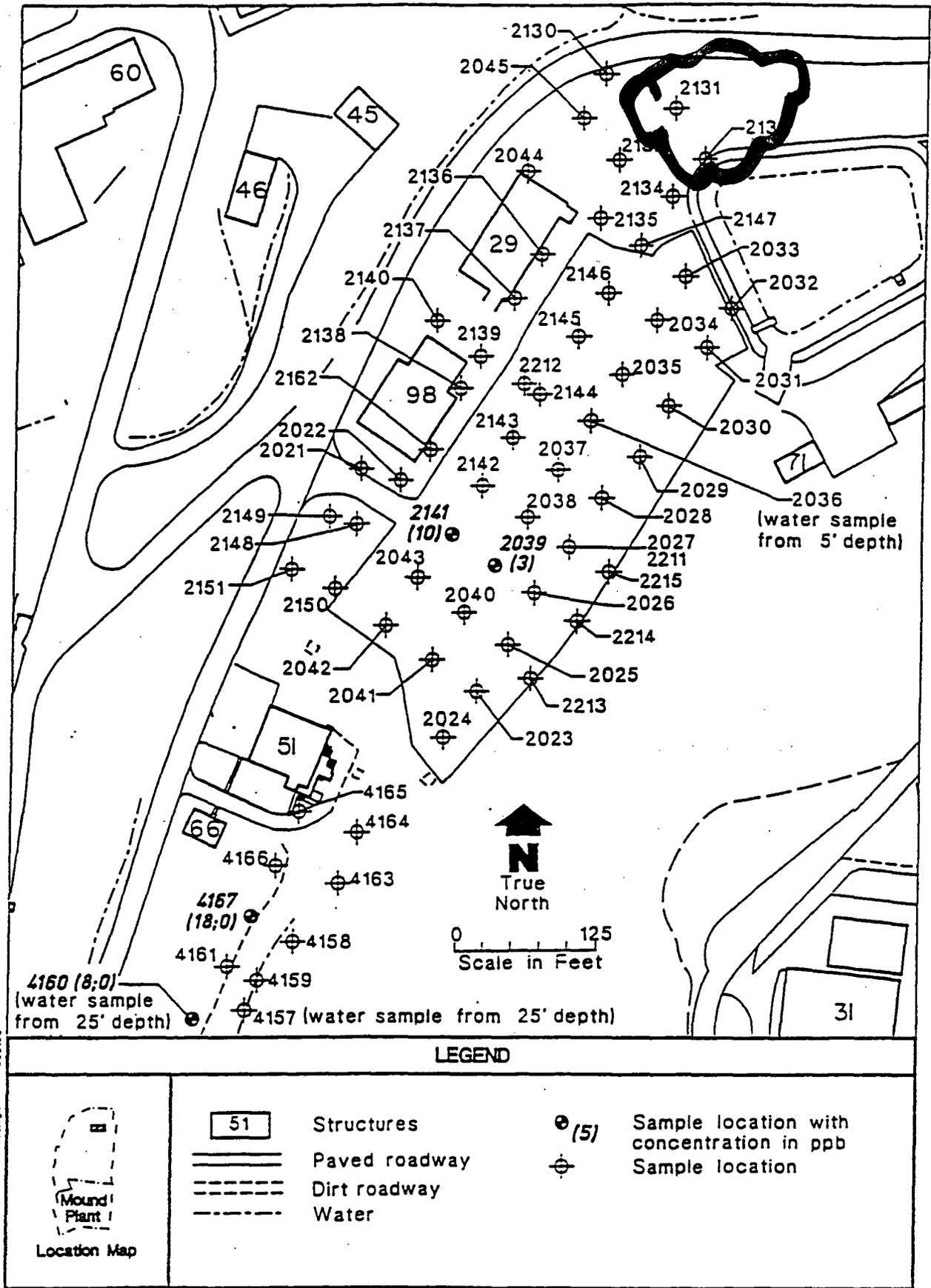


Figure 4.5. Cis-1,2-Dichloroethene Detection Map for Area 7 from 1992 Soil Gas Survey

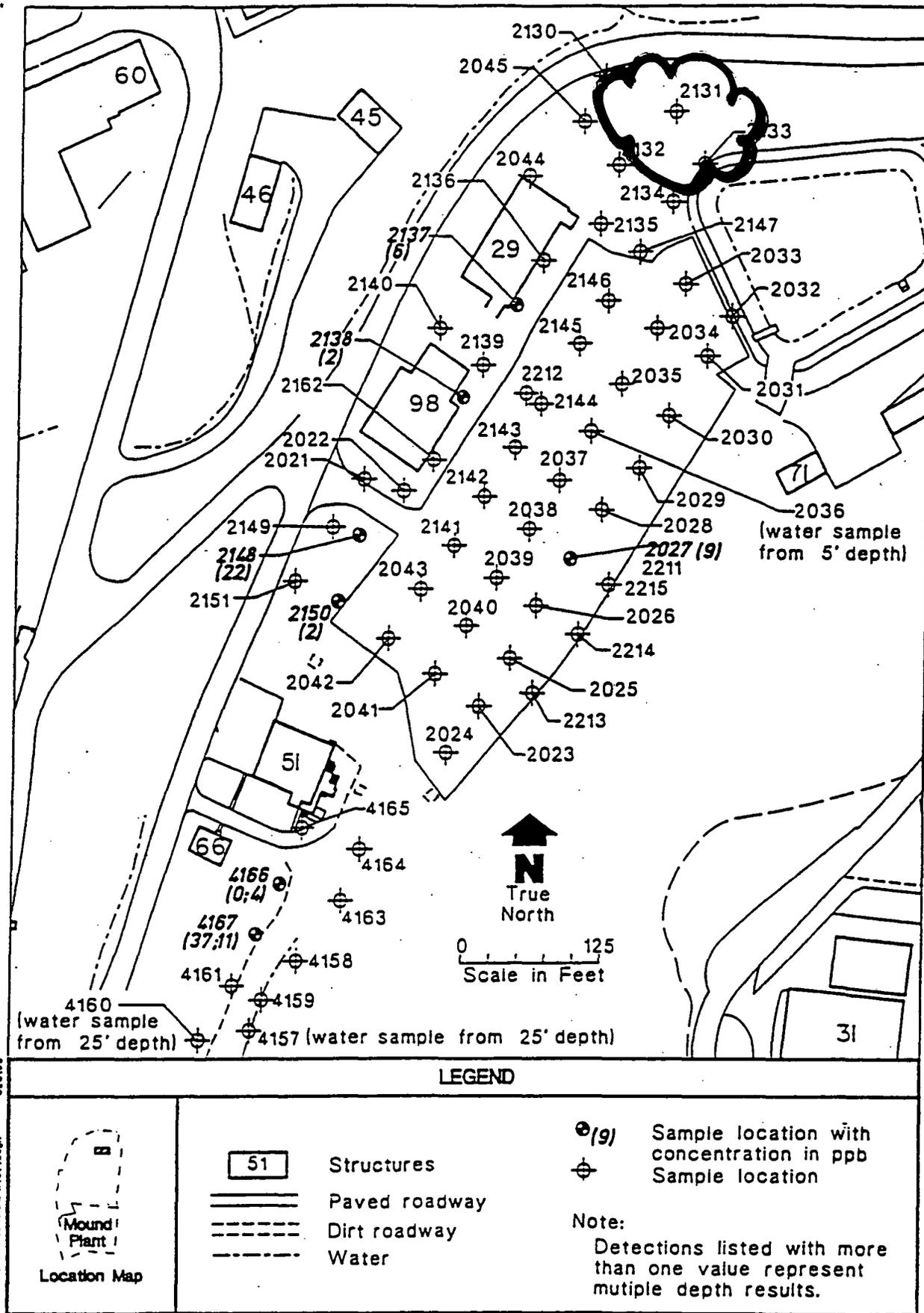


Figure 4.6. 1,1,1-Trichloroethane Detection Map for Area 7 from 1992 Soil Gas Survey

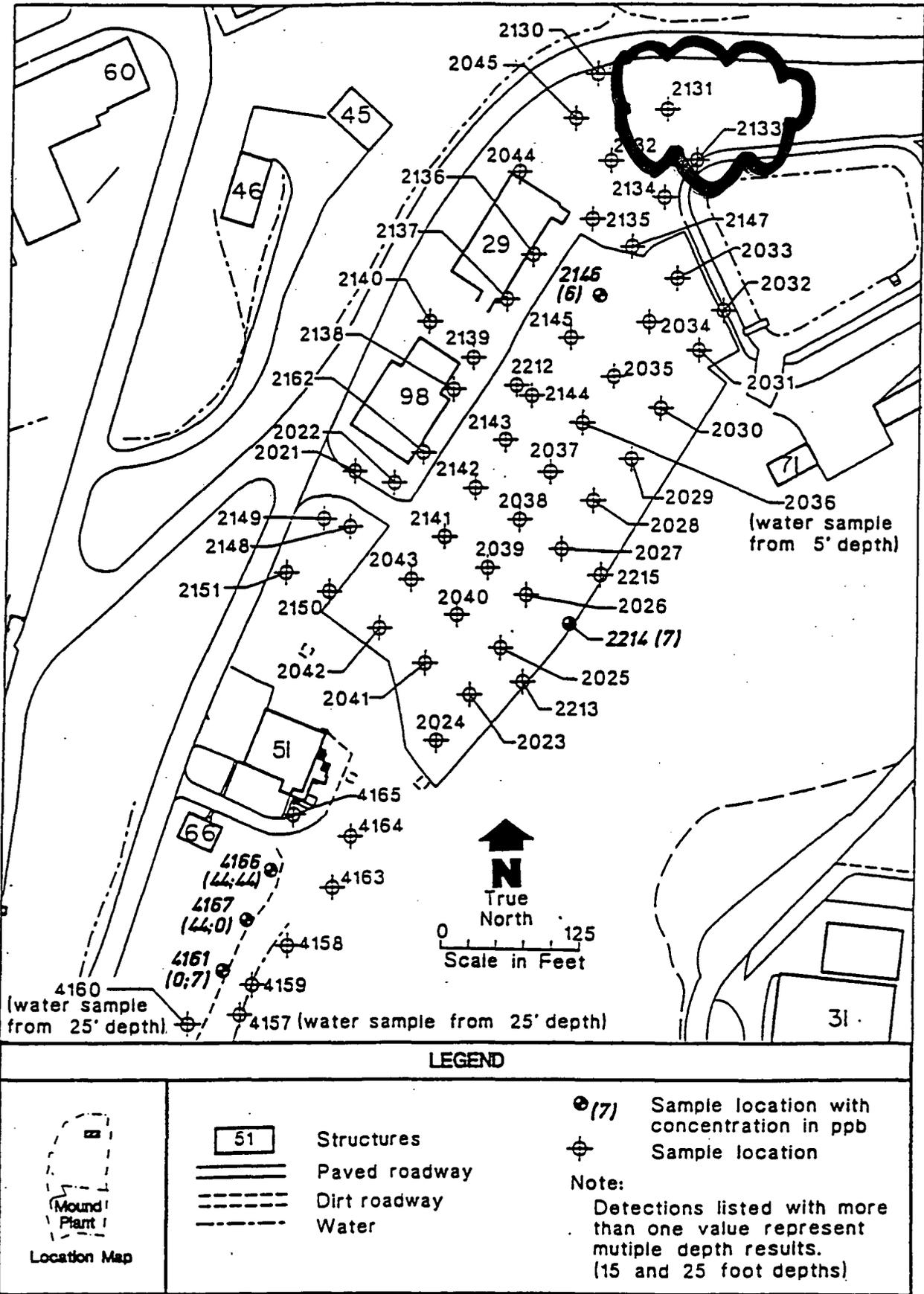
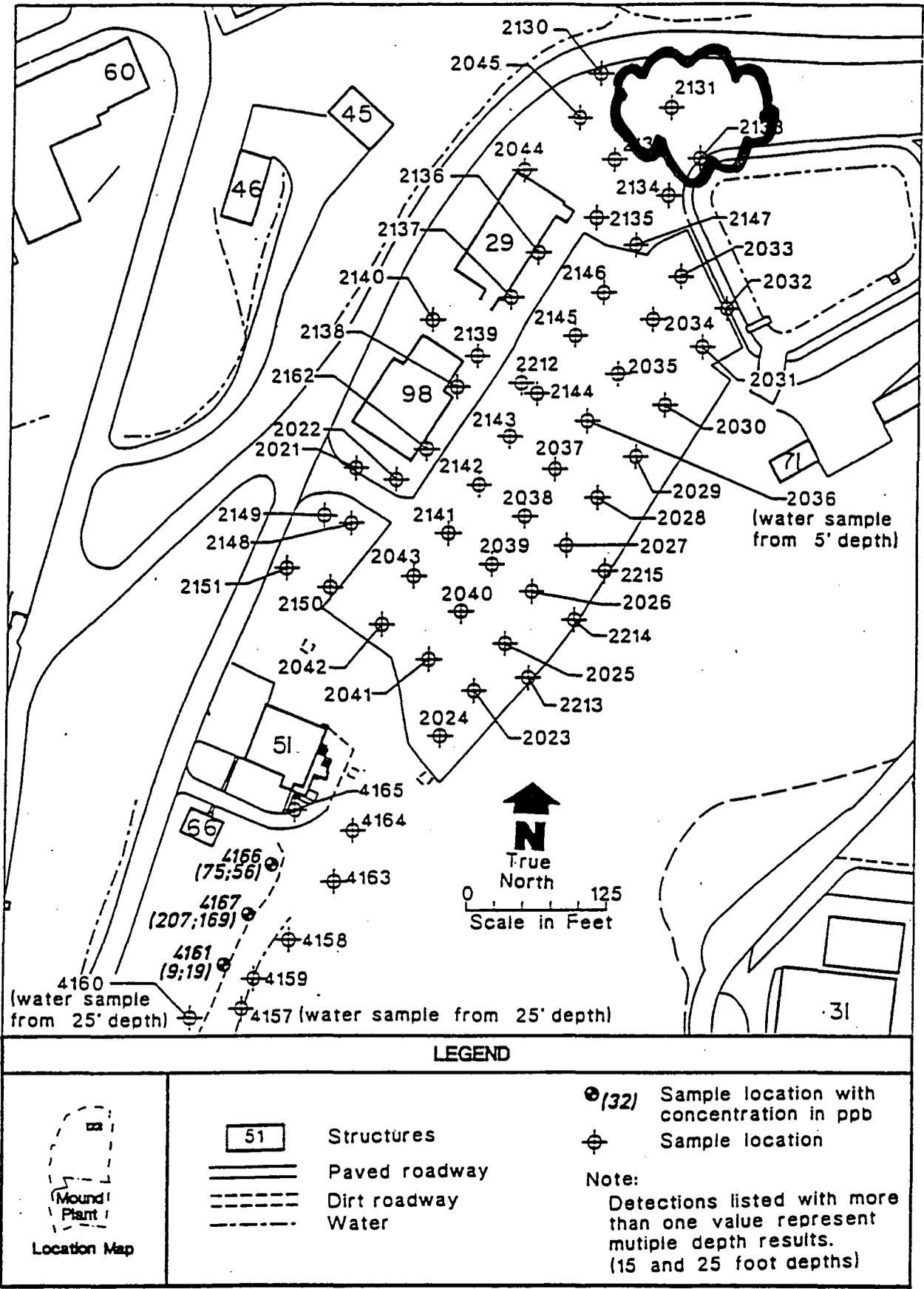


Figure 4.7. Tetrachloroethene Detection Map for Area 7 from 1992 Soil Gas Survey



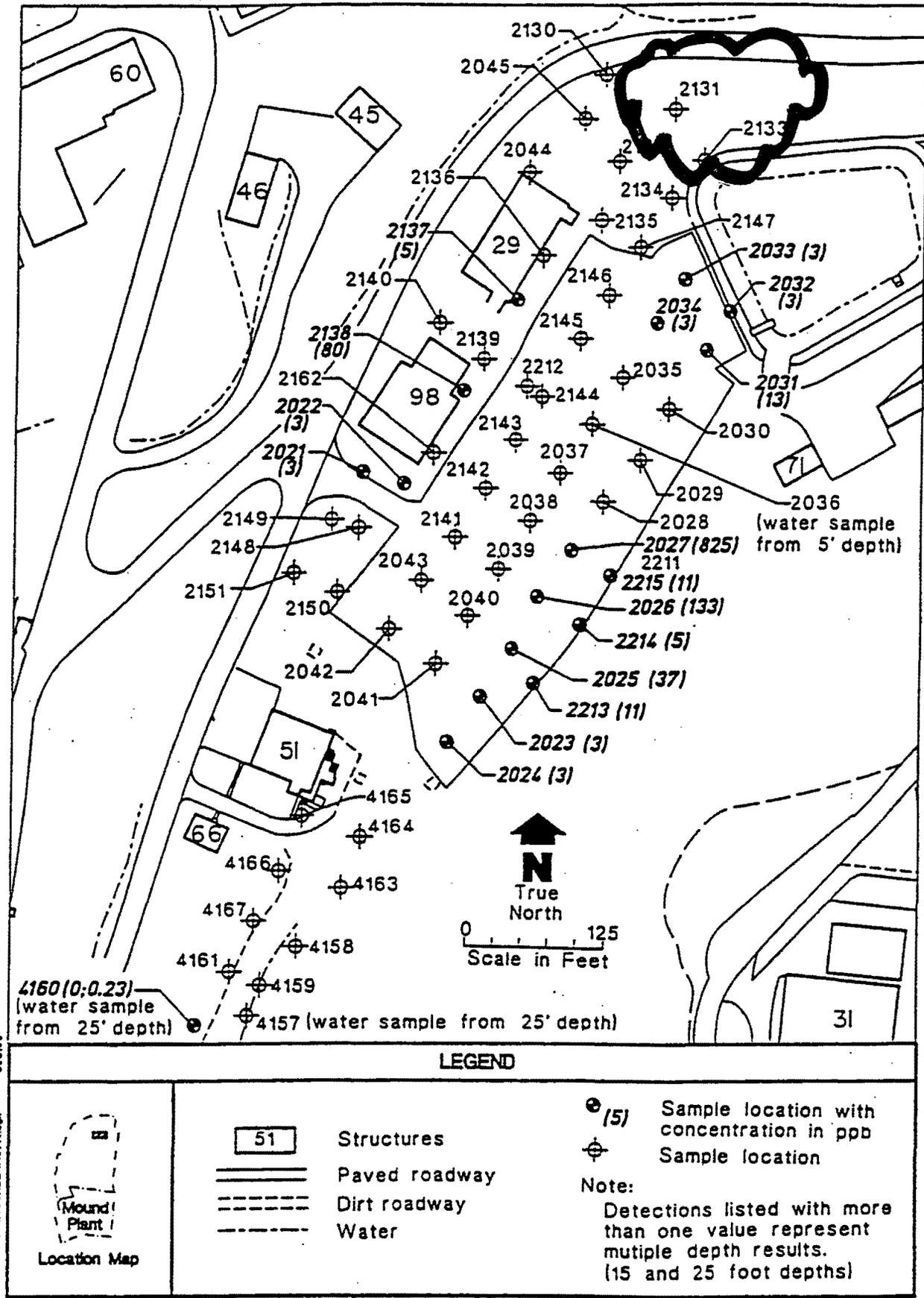


Figure 4.9. Toluene Detection Map for Area 7 from 1992 Soil Gas Survey

Table IV.7. Historical Subsurface Soil Samples VOCs and SVOC Analysis
Page 1 of 2

Analyte	Monitoring Well 0322				Bedrock Boring 0384				Monitoring Well 0395			
	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)
VOCs												
2-Butanone	45J	10-15	6J	25-30	10J	2-4	60J	13-17	ND	ND	ND	ND
2-Hexane	3J	10-15	3J	10-15	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	3J	10-15	1J	5-10	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	200J	10-15	200J	10-15	ND	ND	ND	ND	ND	ND	ND	ND
Acetonitrile	32J	10-15	32J	10-15	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	13J	10-15	13J	10-15	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	2J	25-30	2J	25-30	ND	ND	ND	ND	1J	40-45	1J	40-45
Trichloromethane	3J	5-10	3J	5-10	ND	ND	ND	ND	ND	ND	ND	ND
Hexane	7J	10-15	3J	30-35	ND	ND	ND	ND	40	50-55	2J	70-75' 85-90
Toluene	6J	20-25	2J	10-15 25-30 35-40	40J	2-8	30J	6-8	6	25-30	1J	70-75
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	9	25-30	9	25-30
SVOCs												
Acenaphthene	ND	ND	ND	ND	110J	2-4	100J	2-4	120J	25-30	120J	25-30
Acenaphthylene	ND	ND	ND	ND	91J	2-4	91J	2-4	ND	ND	ND	ND
Anthracene	44J	5-10	44J	5-10	190J	2-4	190J	2-4	120J	25-30	120J	25-30
Benzo(a)Anthracene	110J	5-10	110J	5-10	520	2-4	93J	13-14.5	230J	25-30	55J	30-35
Benzo(a)Pyrene	74J	5-10	74J	5-10	540	2-4	84J	13-14.5	210J	25-30	68J	30-35
Benzo(b)Fluoranthene	65J	5-10	65J	5-10	490	2-4	160J	6-8	200J	15-20	60J	30-35
Benzo(g,h,i)Perylene	ND	ND	ND	ND	390J	2-4	59J	13-14.5	140J	15-20	61J	30-35

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Table IV.7. Historical Subsurface Soil Samples/VOC and SVOC Analysis
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Analyte	Monitoring Well 0322				Bedrock Boring 0384				Monitoring Well 0395			
	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)
Benzo(k)Fluoranthene	76J	5-10	76J	10-15	510	2-4	88J	13-14.5	200J	15-20	54J	30-35
Benzoic Acid	63J	10-15	63J	10-15	ND	ND	ND	ND	77J	50-55	41J	10-15
Bis(2-ethylhexyl)phthalate	180J	40-45	43J	35-40	42J	22-23 27-28	42J	22-23 27-28	71J	15-20	40J	55-60
Carbazole	ND	ND	ND	ND	65J	2-4	65J	2-4	62J	25-30	62J	25-30
Chrysene	100J	5-10	43J	0-5	540	2-4	110J	13-14.5	230J	15-20	78J	30-35
Diethyl Phthalate	81J	40-45	53J	35-40	ND	ND	ND	ND	ND	ND	ND	ND
Di-N-Butyl Phthalate	ND	ND	ND	ND	52J	22-23	41J	27-28	59J	25-30	46J	30-35
Dibenzo(a,h)Anthracene	ND	ND	ND	ND	44J	6-8	44J	6-8	65J	15-20	48J	25-30
Dibenzofuran	ND	ND	ND	ND	83J	2-4	83J	2-4	42J	25-30	42J	25-30
Fluoranthene	250J	5-10	250J	5-10	1200	2-4	210J	13-14.5	630	25-30	40J	5-10
Fluorene	ND	ND	ND	ND	110J	2-4	110J	2-4	84J	25-30	84J	25-30
Indeno(1,2,3-CD)Pyrene	ND	ND	ND	ND	360J	2-4	61J	13-14.5	140J	15-20	46J	30-35
Phenanthrene	200J	5-10	200J	5-10	770	2-4	110J	13-14.5	480	25-30	76J	30-35
Pyrene	300J	5-10	300J	5-10	1000	2-4	190J	13-14.5	490	25-30	140J	30-35

Source: OU9 Hydrogeologic Investigation: Soil Chemistry Report (DOE 1994a)
 ND not detected
 J estimated value
 ppb parts per billion

A variety of metals were detected in subsurface soil samples from monitoring well 0322 and 0395, and bedrock boring 0384. Twenty-three metals were detected with most of them detected in all three borings.

Bismuth was found only in well 0322, mercury and thallium were found only in well 0395. Table IV.8 presents a summary of metals detected in subsurface soil samples from historical borings.

4.4.2. Comparison of Historical Subsurface Soil Chemical Data to Phase 1 and Phase 2 Data

The following subsections compare historical subsurface soil chemical data to Phase 1 and Phase 2 data.

4.4.2.1. Comparison of 1992 Soil Gas Survey to Phase 1 Soil Gas Survey

As shown by Table IV.6 and Figure 4.9, the 1992 soil gas survey detected mostly toluene, primarily along the eastern edge of the parking lot, as well as near Buildings 29 and 98. This is inconsistent with the Phase 1 soil gas survey conducted during this investigation which shows limited dispersion of aromatic hydrocarbons (of which toluene is a primary component) in Zone 3 to the east (see Appendix D, Plate 2). Conversely, most the aromatics detected by the Phase 1 soil gas survey were in Zone 2 which is to the west.

Also detected by the 1992 soil gas survey were the halogenated hydrocarbons freon-11; freon-113; cis-1,2-DCE; 1,1,1-TCA; PCE; and TCE (see Table IV.6 and figures 4.3 through 4.8). These were detected less frequently than toluene and were mostly found south of Building 51, as well as to the west near Buildings 29 and 98. The Phase 1 soil gas survey was not conducted near Building 51 so a comparison in this area is not possible but the Phase 1 soil gas survey did show widespread dispersion of halogenated hydrocarbons in Zone 2 bordering Area 7 to the west.

It should be noted that the 1992 soil gas survey was conducted within the boundaries of Area 7 and the Phase 1 soil gas survey was conducted over three outlying areas (Zones 1, 2, and 3) outside the boundary of Area 7. However, a soil gas survey was also conducted for the Non-AOC Field Report (DOE 1994b) with approximately thirty of the grid points, spaced 100 feet apart, near or within the Area 7 boundary. Aromatics (i.e. toluene) were not detected at any of these soil gas sampling locations, though some halogenated hydrocarbons were detected south of Building 51 which compares favorably to the 1992 soil gas survey.

Table IV.8. Historical Subsurface Soil Samples/Metals Analysis
Page 1 of 2

Analyte	Monitoring Well 0322				Bedrock Boring 0384				Monitoring Well 0395			
	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)
Aluminum	13,100	10-15	4270	15-20	16,900	16-17	8080	6-8	12,500	30-35	2300	35-40
Antimony	7.8	10-15	1.9	40-45	7.4J	13-14.5	2.5	22-23	7.9	75-80	2.4	85-90
Barium	82.6	10-15	11.2	45-50	67.9	13-14.5	21.6	6-8	41.2	75-80	0.40	50-55
Beryllium	0.97	10-15	0.5	30-35	1.1	16-17	0.55	6-8	0.66	25-30	0.40	50-55
Bismuth	41.5J	45-50	27.5J	35-40	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	285,000	40-45	9020	10-15	99,300	6-8	21,500	22-23	203,000	55-60	54,600	75-80
Chromium	15.4	10-15	3.9	40-45	22.6	22-23	10.6	6-8	19.5	30-35	5.6	65-70
Cobalt	10.6	10-15	3.1	40-45	19.3	22-23	6.9	6-8	9.9	30-35	2.0	65-70
Copper	22.8	10-15	9.6	40-45	31	22-23	14.4	6-8	36.7	30-35	7.3	60-65
Iron	29,100	10-15	11,500	20-25	33,000	22-23	18,700	6-8	27,300	25-30	7360	60-65
Lead	18.9	10-15	4.5	40-45	43.1	13-14.5	4.0	16-17	11.5	25-30	4.2	80-85
Lithium	18.5J	5-10	5.3J	20-25	40.5J	22-23	15J	2-4	34.1J	30-35	5.8	70-75
Magnesium	52,000	15-20	6760	10-15	28,700	2-4	7050	27-28	72,600	80-85	10,300	85-90
Manganese	1230	10-15	187	15-20	1100	22-23	562	2-4	872	85-90	189	65-70
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	0.27	10-15	0.22	60-65
Molybdenum	9.4	10-15	3.5	40-45	8.5	22-23	5.7J	6-8	5.7	30-35	2.9	5-10
Nickel	23.5	10-15	7.8	40-45	38.7	22-23	16	6-8	23.9	30-35	7.8	65-70

Table IV.8. Historical Subsurface Soil Samples/Metals Analysis
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Analyte	Monitoring Well 0322				Bedrock Boring 0384				Monitoring Well 0395			
	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)	Maximum (ppb)	Depth (feet)	Minimum (ppb)	Depth (feet)
Potassium	2530	45-50	812	40-45	3150	22-23	1140	6-8	2660	30-35	646	60-65
Silver	8.3	10-15	2.6	15-20	9.9	22-23	5.2	6-8	7.7	30-35	2.5J	65-70
Sodium	493	10-15	149	25-30	332	2-4	132	13-14.5	440	30-35	141	70-75
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	0.32	75-80	0.32	75-80
Vandium	35.9	10-15	11.8	40-45	32.9	22-23	19.4	6-8	24.5	30-35	9.5	35-40
Zinc	87.8	25-30	20.6	40-45	66.9	22-23	43.7	6-8	53J	30-35	21.5	60-65

Source: OU9 Hydrogeologic Investigation: Soil Chemistry Report (DOE 1994a)
 ND not detected
 J estimated value
 ppb parts per billion

Environmental Restoration Program

**OPERABLE UNIT 5
OPERATIONAL AREA PHASE I INVESTIGATION
AREA 7 FIELD REPORT**

**MOUND PLANT
MIAMISBURG, OHIO**

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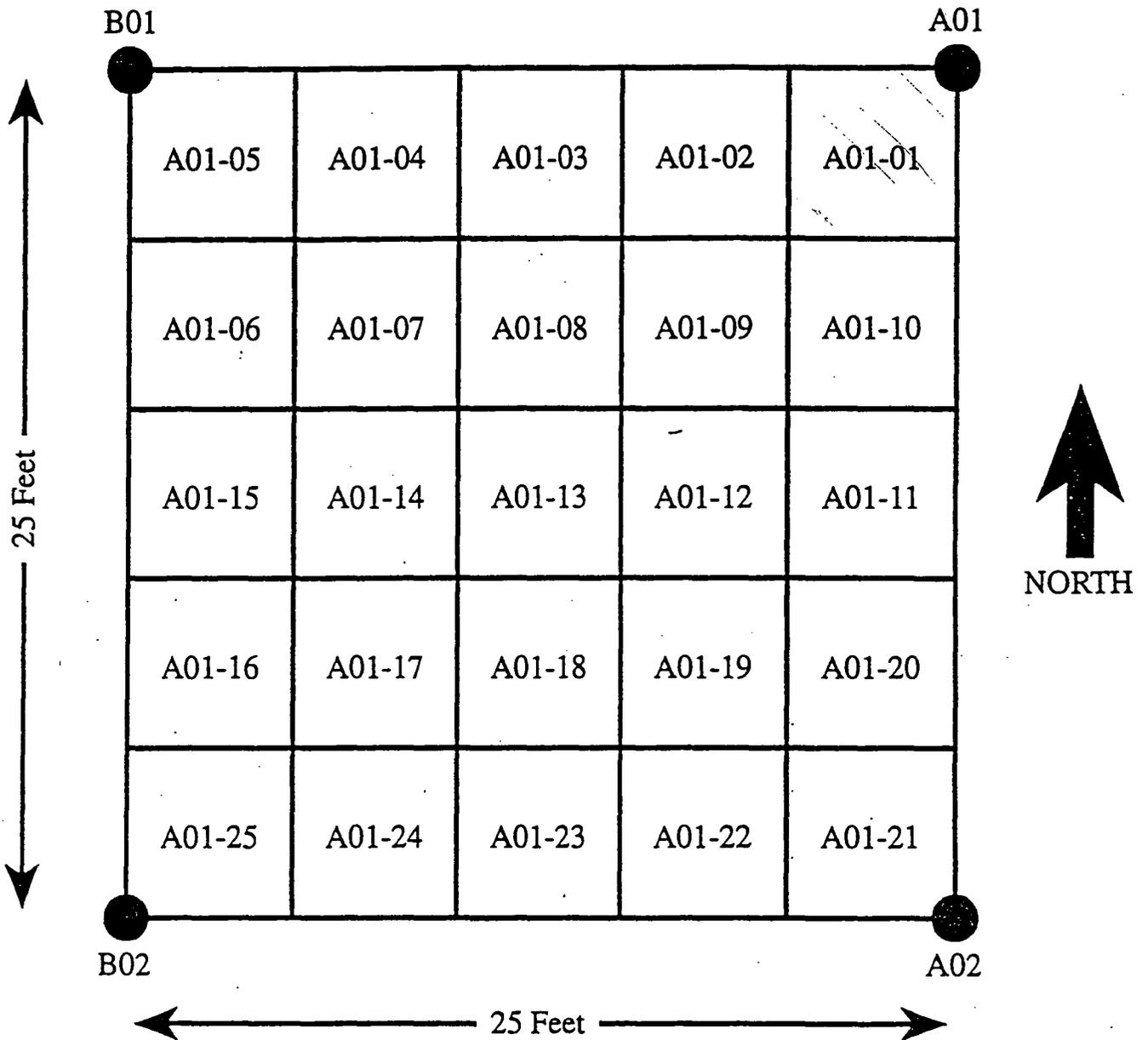
June 1995

Final (Revision 0)



**U.S. Department of Energy
Ohio Field Office**

EG&G Mound Applied Technologies



Operable Unit 5, Operational Area, Phase 1 Investigation -
 Generic Sampling Identification Scheme for the FIDLER survey
 conducted in Area 7

APPENDIX C

RADIOLOGICAL DATA (FIDLER SURVEY & MOUND SOIL SCREENING FACILITY) FOR AREA 7

SMPID	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7A01	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7A01-01	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-02	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7A01-03	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-04	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-05	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7A01-06	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-07	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-08	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-09	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7A01-10	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-11	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-12	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-13	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-14	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-15	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-16	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-17	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7A01-18	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-19	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-20	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-21	178.1	NA	11.70	NA	13.0	4.5	NC		NC	
7A01-22	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-23	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-24	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A01-25	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7A02	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7A02-01	178.1	NA	11.70	NA	13.0	4.5	NC		NC	
7A02-02	178.1	NA	11.70	NA	13.0	5.0	NC		NC	
7A02-03	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A02-04	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A02-05	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A02-06	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A02-07	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A02-08	178.1	NA	11.70	NA	13.0	4.5	NC		NC	

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SMPID	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria C111	FIDLER Readings C111	Contamination Criteria C112	FIDLER Readings C112	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:	
7A02-09	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7A02-10	178.1	NA	11.70	NA	13.0	4.5	NC		NC	
7A02-11	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-12	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-13	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-14	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-15	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-16	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-17	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-18	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-19	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-20	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-21	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-22	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-23	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-24	NA	NA	NA	NA	NA	NR	NC		NC	
7A02-25	NA	NA	NA	NA	NA	NR	NC		NC	
7A03	NA	NA	NA	NA	NA	NR	3	a	0.2	a
7A03-01	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7A03-02	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A03-03	NA	NA	NA	NA	NA	NR	NC		NC	
7A03-04	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A03-05	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7A03-06	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7A03-07	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7A03-08	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-09	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-10	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7A03-11	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-12	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-13	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-14	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-15	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7A03-16	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7A03-17	182.0	NA	10.66	NA	11.7	5.0	NC		NC	

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SMPID	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA				
	Contamination Criteria C111	FIDLER Readings C111	Contamination Criteria C112	FIDLER Readings C112	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:	
7A03-18	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A03-19	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A03-20	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7A03-21	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7A03-22	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7A03-23	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A03-24	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A03-25	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7A04	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7B01	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7B01-01	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-02	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-03	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-04	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-05	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-06	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-07	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-08	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-09	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-10	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-11	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-12	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-13	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-14	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-15	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-16	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7B01-17	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7B01-18	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-19	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-20	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B01-21	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-22	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B01-23	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7B01-24	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7B01-25	182.0	NA	10.66	NA	11.7	4.5	NC		NC	

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	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7B02	NA	NA	NA	NA	NA	NR	6	a	0.2	a
7B03	182	NA	10.66	NA	11.7	3.5	0	a	0.1	a
7B03-01	182.0	NA	10.66	NA	11.7	3.5	NC		NC	
7B03-02	182.0	NA	10.66	NA	11.7	3.0	NC		NC	
7B03-03	182.0	NA	10.66	NA	11.7	3.5	NC		NC	
7B03-04	NA	NA	NA	NA	NA	NR	NC		NC	
7B03-05	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7B03-06	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B03-07	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7B03-08	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7B03-09	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B03-10	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B03-11	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7B03-12	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7B03-13	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7B03-14	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7B03-15	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7B03-16	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7B03-17	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7B03-18	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7B03-19	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7B03-20	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7B03-21	182.0	NA	10.66	NA	11.7	4.0	NC		NC	
7B03-22	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B03-23	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B03-24	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B03-25	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7B04	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7C01	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7C01-01	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7C01-02	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7C01-03	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7C01-04	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7C01-05	178.1	NA	11.70	NA	13.0	5.0	NC		NC	
7C01-06	178.1	NA	11.70	NA	13.0	5.5	NC		NC	

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	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:	
7C01-07	178.1	NA	11.70	NA	13.0	4.5		NC		
7C01-08	178.1	NA	11.70	NA	13.0	4.5		NC		
7C01-09	178.1	NA	11.70	NA	13.0	4.0		NC		
7C01-10	178.1	NA	11.70	NA	13.0	4.0		NC		
7C01-11	178.1	NA	11.70	NA	13.0	3.5		NC		
7C01-12	178.1	NA	11.70	NA	13.0	3.5		NC		
7C01-13	178.1	NA	11.70	NA	13.0	4.0		NC		
7C01-14	178.1	NA	11.70	NA	13.0	4.5		NC		
7C01-15	178.1	NA	11.70	NA	13.0	6.0		NC		
7C01-16	178.1	NA	11.70	NA	13.0	8.0		NC		
7C01-17	178.1	NA	11.70	NA	13.0	6.0		NC		
7C01-18	178.1	NA	11.70	NA	13.0	4.0		NC		
7C01-19	178.1	NA	11.70	NA	13.0	3.5		NC		
7C01-20	178.1	NA	11.70	NA	13.0	3.5		NC		
7C01-21	178.1	NA	11.70	NA	13.0	3.5		NC		
7C01-22	178.1	NA	11.70	NA	13.0	3.5		NC		
7C01-23	178.1	NA	11.70	NA	13.0	4.0		NC		
7C01-24	178.1	NA	11.70	NA	13.0	5.0		NC		
7C01-25	178.1	NA	11.70	NA	13.0	8.0		NC		
7C02	NA	NA	NA	NA	NA	NR		WIPE	c	
7C02-01	178.1	NA	11.70	NA	13.0	3.5		NC		
7C02-02	178.1	NA	11.70	NA	13.0	3.5		NC		
7C02-03	178.1	NA	11.70	NA	13.0	4.0		NC		
7C02-04	178.1	NA	11.70	NA	13.0	4.5		NC		
7C02-05	178.1	NA	11.70	NA	13.0	7.5		NC		
7C02-06	178.1	NA	11.70	NA	13.0	8.0		NC		
7C02-07	178.1	NA	11.70	NA	13.0	5.0		NC		
7C02-08	178.1	NA	11.70	NA	13.0	4.0		NC		
7C02-09	178.1	NA	11.70	NA	13.0	3.5		NC		
7C02-10	178.1	NA	11.70	NA	13.0	3.5		NC		
7C02-11	178.1	NA	11.70	NA	13.0	4.0		NC		
7C02-12	178.1	NA	11.70	NA	13.0	4.5		NC		
7C02-13	178.1	NA	11.70	NA	13.0	4.5		NC		
7C02-14	178.1	NA	11.70	NA	13.0	5.5		NC		
7C02-15	178.1	NA	11.70	NA	13.0	7.5		NC		

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SMPID)	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria C111	FIDLER Readings C111	Contamination Criteria C112	FIDLER Readings C112	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7C02-16	178.1	NA	11.70	NA	13.0	8.5	NC		NC	
7C02-17	178.1	NA	11.70	NA	13.0	5.5	NC		NC	
7C02-18	178.1	NA	11.70	NA	13.0	5.0	NC		NC	
7C02-19	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7C02-20	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7C02-21	178.1	NA	11.70	NA	13.0	3.5	NC		NC	
7C02-22	178.1	NA	11.70	NA	13.0	4.0	NC		NC	
7C02-23	178.1	NA	11.70	NA	13.0	4.5	NC		NC	
7C02-24	178.1	NA	11.70	NA	13.0	6.5	NC		NC	
7C02-25	178.1	NA	11.70	NA	13.0	7.5	NC		NC	
7C03	NA	NA	NA	NA	NA	NR	5	a	0.2	a
7C03-01	182.0	NA	10.66	NA	11.7	4.5	NC		NC	
7C03-02	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7C03-03	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7C03-04	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7C03-05	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7C03-06	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7C03-07	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7C03-08	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7C03-09	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7C03-10	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7C03-11	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7C03-12	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7C03-13	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7C03-14	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7C03-15	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7C03-16	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7C03-17	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7C03-18	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7C03-19	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7C03-20	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7C03-21	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7C03-22	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7C03-23	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7C03-24	182.0	NA	10.66	NA	11.7	5.5	NC		NC	

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SMPID	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7C03-25	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7C04	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7D01	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7D01-01	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7D01-02	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7D01-03	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7D01-04	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7D01-05	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7D01-06	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7D01-07	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7D01-08	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7D01-09	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7D01-10	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7D01-11	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7D01-12	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7D01-13	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7D01-14	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7D01-15	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7D01-16	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D01-17	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D01-18	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D01-19	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D01-20	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D01-21	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D01-22	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D01-23	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D01-24	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D01-25	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02	NA	NA	NA	NA	NA	NR	24	a	0.7	a
7D02-01	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-02	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-03	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-04	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-05	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-06	182.0	NA	10.66	NA	11.7	8.5	NC		NC	

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SMPID	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria C111	FIDLER Readings C111	Contamination Criteria C112	FIDLER Readings C112	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7D02-07	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D02-08	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D02-09	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-10	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-11	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-12	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-13	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D02-14	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D02-15	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7D02-16	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-17	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-18	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D02-19	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7D02-20	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7D02-21	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-22	182.0	NA	10.66	NA	11.7	7.5	NC		NC	
7D02-23	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-24	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D02-25	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D03	NA	NA	NA	NA	NA	NR	9	a	1.1	a
7D03-01	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D03-02	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D03-03	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D03-04	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D03-05	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D03-06	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D03-07	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D03-08	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D03-09	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D03-10	182.0	NA	10.66	NA	11.7	9.0	NC		NC	
7D03-11	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D03-12	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D03-13	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D03-14	182.0	NA	10.66	NA	11.7	9.5	NC		NC	
7D03-15	182.0	NA	10.66	NA	11.7	9.0	NC		NC	

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RADIOLOGICAL DATA (FIDLER SURVEY & MOUND SOIL SCREENING FACILITY) FOR AREA 7

SMPID	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7D03-16	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D03-17	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D03-18	182.0	NA	10.66	NA	11.7	8.5	NC		NC	
7D03-19	182.0	NA	10.66	NA	11.7	8.0	NC		NC	
7D03-20	182.0	NA	10.66	NA	11.7	7.0	NC		NC	
7D03-21	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7D03-22	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7D03-23	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7D03-24	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7D03-25	182.0	NA	10.66	NA	11.7	6.5	NC		NC	
7D04	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7E01	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7E02	NA	NA	NA	NA	NA	NR	22	a	0.7	a
7E03	NA	NA	NA	NA	NA	NR	18	a	0.8	a
7E04	NA	NA	NA	NA	NA	NR	8	a	0.6	a
7F07	NA	NA	NA	NA	NA	NR	WIPE	c	WIPE	c
7F07-01	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-02	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-03	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-04	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7F07-05	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7F07-06	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-07	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7F07-08	182.0	NA	10.66	NA	11.7	5.0	NC		NC	
7F07-09	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-10	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7F07-11	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-12	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-13	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-14	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-15	182.0	NA	10.66	NA	11.7	5.5	NC		NC	
7F07-16	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7F07-17	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7F07-18	182.0	NA	10.66	NA	11.7	6.0	NC		NC	
7F07-19	182.0	NA	10.66	NA	11.7	5.5	NC		NC	

Mound Plant, ER Program
Revision 0

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APPENDIX C
RADIOLOGICAL DATA (FIDLER SURVEY & MOUND SOIL SCREENING FACILITY) FOR AREA 7

SMPID	FIDLER SURVEY DATA						MOUND SOIL SCREENING FACILITY DATA			
	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	Contamination Criteria Out Channel	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
7S20	NA	NA	NA	NA	NA	NR	13	a	1	a
7S21	NA	NA	NA	NA	NA	NR	17	a	0.9	a

CH1 - Channel 1

CH2 - Channel 2

NR - Reading not recorded.

NC - No sample collected, location not at grid point.

NA - Reading not taken; contamination criteria not exceeded.

a - Mound Soil Screening Facility detection level of 25.0 pCi/g for Pu-238 and 2.0 pCi/g for Th-232 not exceeded.

b - Mound Soil Screening Facility detection level of 25.0 pCi/g for Pu-238 and 2.0 pCi/g for Th-232 exceeded.

c - Results of the wipe sample were less than 20 disintegrations per minute.

d - Sampling equipment was wiped when sufficient soil for analysis could not be collected. The wipes were screened at the Mound Soil Screening Facility.

CPM - Counts per minute

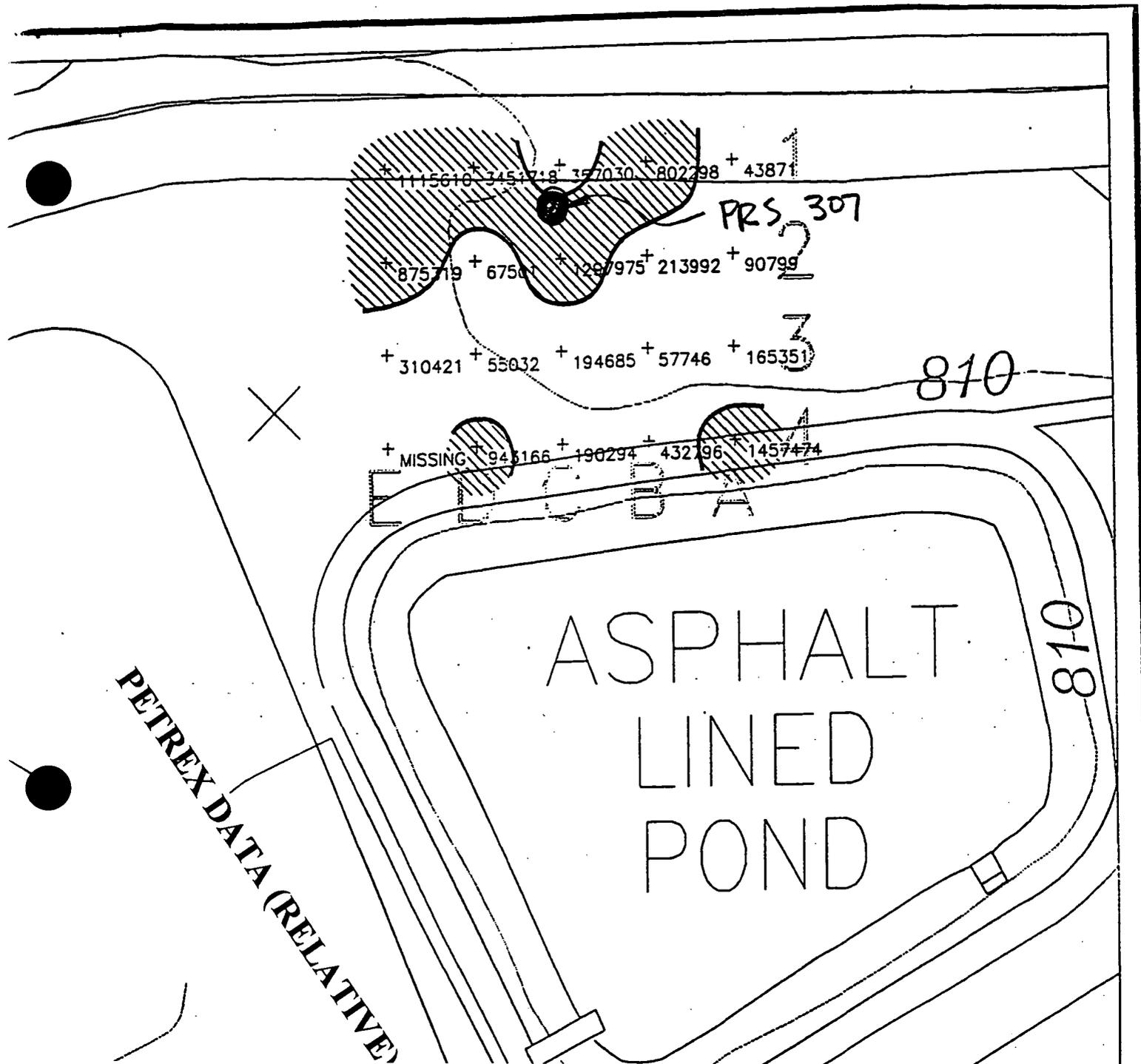
KCPM - Counts per minute x 1000

pCi/g - Picocuries per gram

SMPID - Sample identification number.

RADIOLOGICAL DATA (MOUND SOIL SCREENING FACILITY DATA)
FOR AREA 7 SOIL BORINGS

SOIL BORINGS (B01 - B16)					
MOUND SOIL SCREENING FACILITY DATA					
SOIL	Sample Depth ^b	Plutonium - 238		Thorium - 232	
BORING		Units: pCi/g		Units: pCi/g	
		RESULTS	Note:	RESULTS	Note:
B01	6 inches	20	a	0.9	a
	2	19	a	0.7	a
	3.5	11	a	0.8	a
	5-7	23	a	0.7	a
	10-12	12	a	1.0	a
	15-17	30		0.7	a
	20-22	24	a	0.9	a
	25-27	17	a	0.8	a
	30-32	20	a	1.1	a
B02	6 inches	0	a	0.0	a
	2	0	a	0.6	a
	3.5	24	a	1.1	a
	5-7	9	a	1.7	a
B03	0-2	14	a	0.6	a
	4-6	0	a	1.0	a
	10-12	32		1.2	a
	15-17	26		0.7	a
	25-28	25		0.7	a
	36-38	10	a	1.6	a
38-40	0	a	0.7	a	
B04	6 inches	12	a	0.5	a
	2	23	a	0.8	a
	3.5	18	a	1.8	a
	5-7	14	a	0.9	a
	5-9	16	a	1.1	a
B05	6 inches	25		0.9	a
	2	26		1.5	a
	3.5	22	a	2.0	
	3-5	11	a	1.2	a
B06	6 inches	0	a	0.5	a
	2	16	a	0.9	a
	2-4	21	a	1.2	a
	5-10	7	a	1.0	a
	10-16	20	a	1.6	a
B07	15-17	0	a	18.3	
	15-17	9	a	8.7	
B08	6 inches	0	a	1.3	a
	2	11	a	1.1	a
	5-10	25		1.0	a
	10-22	0	a	0.9	a

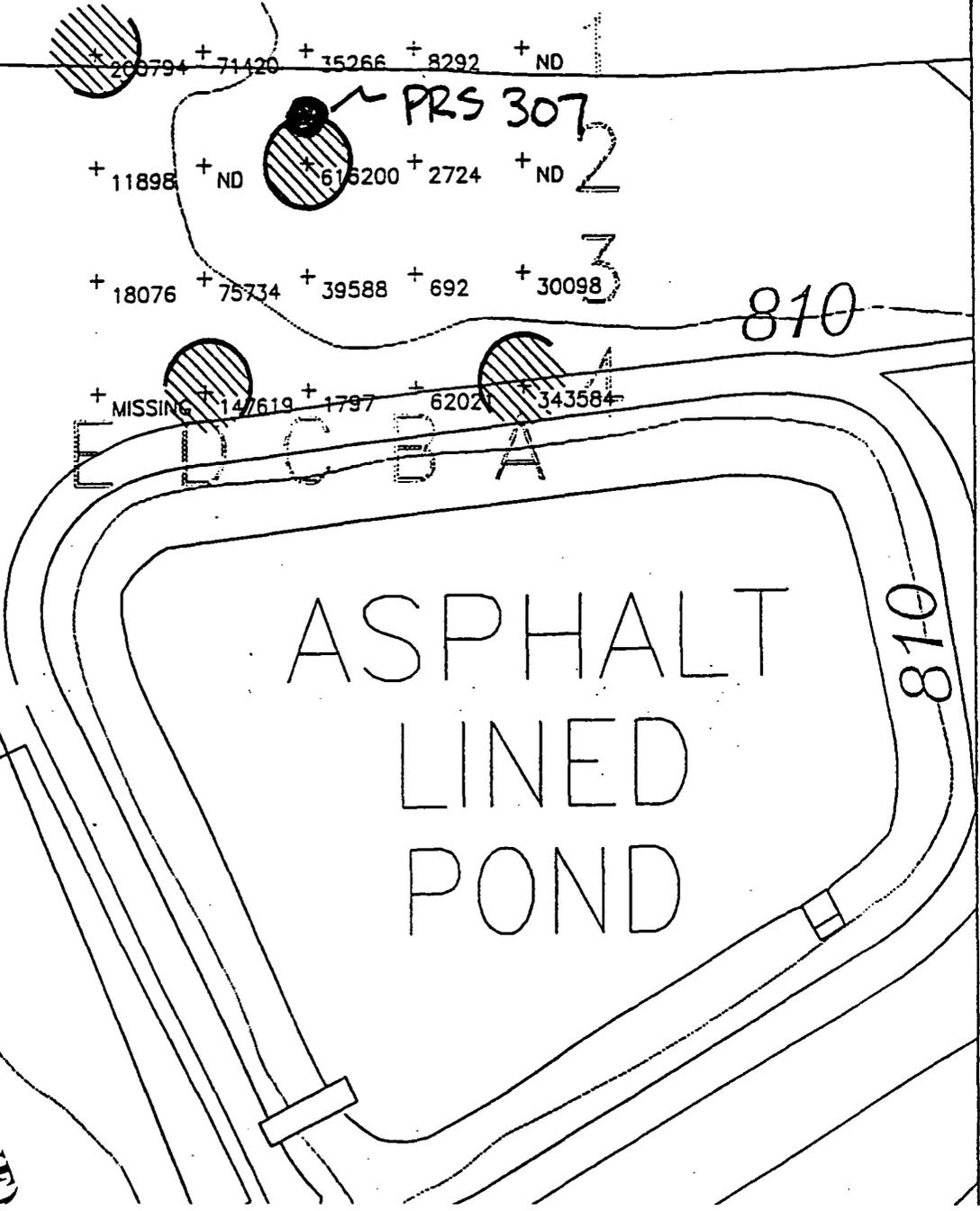


LEGEND				
Relative Response Values (in ion counts):				
NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61
☉ ≥ 4,200,000	☉ ≥ 20,000,000	☉ ≥ 5,000,000	☉ ≥ 10,000,000	☉ ≥ 5,800,000
☉ 850,000-4,199,999	☉ 2,600,000-19,999,999	☉ 850,000-4,999,999	☉ 1,500,000-9,999,999	☉ 1,400,000-5,799,999

Relative Response
 Total Aromatic
 Hydrocarbons

 Plate 2

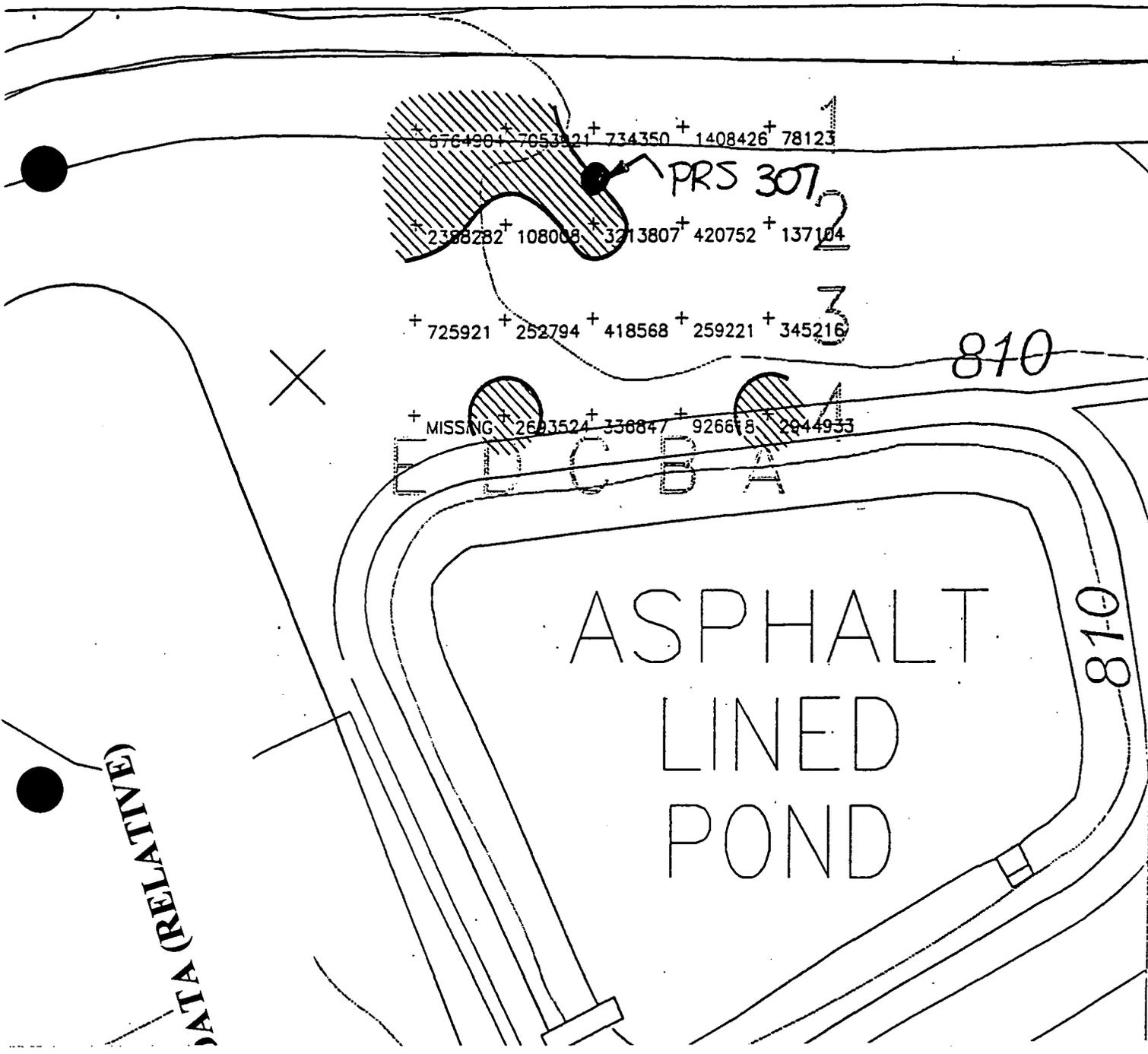
PETREX DATA (RELATIVE)



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	⊙ 60,000-799,999	⊙ 160,000-1,399,999

Relative Response
 Total Semivolatile
 Hydrocarbons

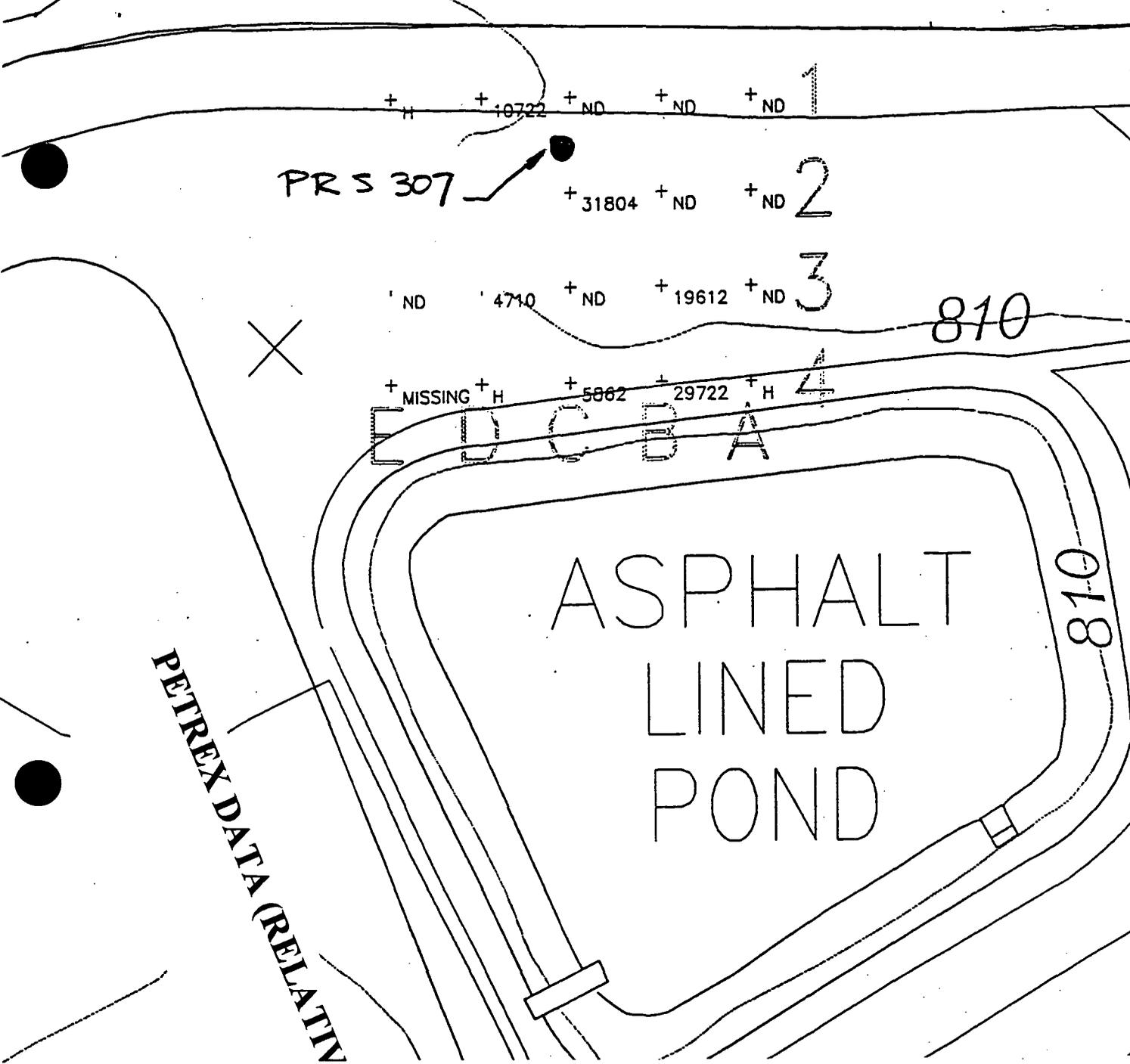
Plate 3



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
<ul style="list-style-type: none"> ● ≥ 500,000 ● 50,000-499,999 	<ul style="list-style-type: none"> ● ≥ 500,000 ● 50,000-499,999 	<ul style="list-style-type: none"> ● ≥ 80,000 ● 20,000-79,999 	<ul style="list-style-type: none"> ● ≥ 400,000 ● 40,000-399,999 	<ul style="list-style-type: none"> ● ≥ 250,000 ● 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**

5.0 Results

S0208

One sample from hot spot S0208 (Area 93) triggered field screening action levels:

- One sample exceeded limits for hazardous compounds

Elevated concentrations of Chromium were detected by the PXRf in soil samples collected from the site.

Table 5.17 shows Hot Spot S0208 field results exceeding action levels. Figure 5.22 graphically represents Hot Spot S0208 field sampling results.

Table 5.17 Hot Spot S0208 Field Sampling Results

Sample ID	FIDLER		Organics		Rad Laboratory					
	Channel 1 (1K)	Channel 2 (5K)	OVA	OVM	Pu 238 (25)	Th 232 (5)	Ra 226 (5)	Cs 137 (15)	Am 241(20)	
9301-5002	<1000	<5000	<1	NA	<28 U	0.2	0.9	<0.01	<0.03	

Sample ID	PXRf Metals								
	As (102.07)	Ba (1489)	Cd	Cr HI	Cr LO (164.43)	Pb (172)	Hg	Se	Ag (2559)
9301-5002	66.626	32.31	<44.5	<347	229.11	<10	<37	<14	58.5042

C0007

Two samples from hot spot C0007 (Area 94) triggered field screening action levels:

- One sample exceeded limits for hazardous compounds
- One sample exceeded limits for radionuclides

Elevated concentrations of Chromium were detected by the PXRf in soil samples collected from the site. Elevated concentrations of Pu238 were found in excess of 80 pCi/g in soil samples collected from the site.

Table 5.18 shows Hot Spot C0007 field results exceeding action levels. Figure 5.23 graphically represents Hot Spot C0007 field sampling results.

Table 5.18 Hot Spot C0007 Field Sampling Results

Sample ID	FIDLER		Organics		Rad Laboratory					
	Channel 1 (1K)	Channel 2 (5K)	OVA	OVM	Pu 238 (25)	Th 232 (5)	Ra 226 (5)	Cs 137 (15)	Am 241(20)	
9404-5004	<1000	<5000	<1	<1	<35.9 U	0.4	1.3	<0.01	<0.03	
9404-5008	<1000	<5000	<1	<1	80.7 U	0.23	0.78	<0.05	<0.05	

Sample ID	PXRf Metals								
	As (102.07)	Ba (1489)	Cd	Cr HI	Cr LO (164.43)	Pb (172)	Hg	Se	Ag (2559)
9404-5004	63.687	137.26	<44.5	<347	253.66	<10	<37	<14	30.4994
9404-5008	72.678	261.32	<44.5	<347	<60.7	<10	<37	<14	58.6747

Although above the Other Soils field screening level, this chromium concentration is 4000 times less than the 10^{-6} Risk Based Guideline Value.

ER Program, Mound Plant
90% Draft (Rev. 0)

NA&D&O-SOILSREPORTTEXTPROJECT

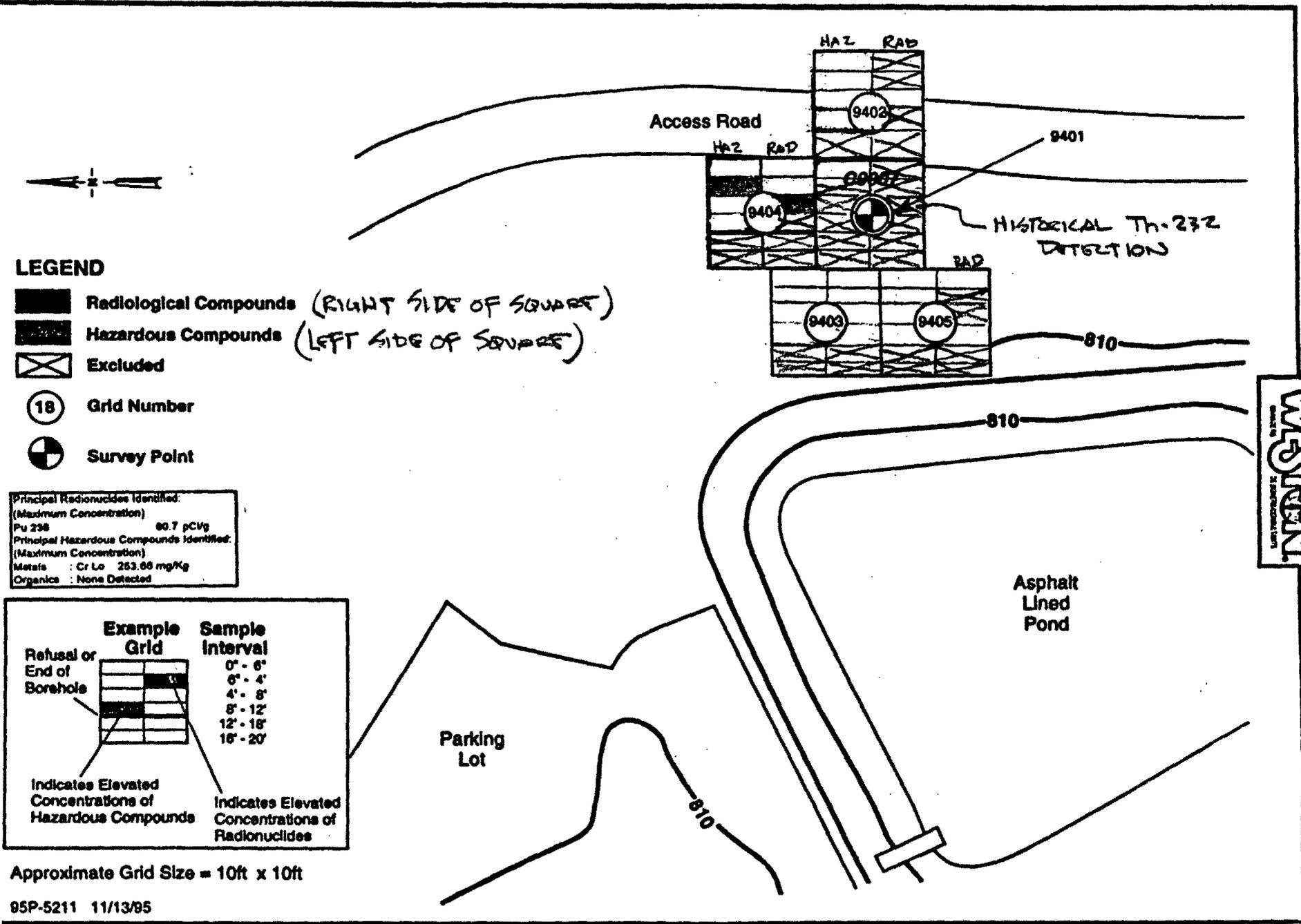


FIGURE 5.23 HOT SPOT C0007

Gamma Scan Data

Sample ID	Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
9202-5012	<0.14	0.17	<1.43	<0.75	<16.54	0.95	<2.91	<16.95	<142.1	<0.14
9203-5004	<0.12	<0.08	2.63	<0.65	<13.69	0.69	<3.25	<13.97	<146.9	<0.18
9203-5008	<0.12	0.13	3.05	<0.64	<14.11	0.95	<2.91	<18.78	<125.7	<0.15
9203-5012	<0.08	<0.08	<1.05	0.6	<14.16	0.8	<2.81	<11.68	<168.1	<0.17
9203-5016	<0.1	0.05	2.76	<0.49	<13.7	0.67	<3.18	10.23	<113.1	<0.15
9203-5020	<0.07	<0.09	1.56	<0.56	<12.91	0.65	<2.8	<10.65	<131.9	0.11
9203-5020	<0.03	<0.03		1.9 <0.2	<4.5	0.8	<0.9	<3.8	<55.1	<0.05
9204-5004	<0.08	0.06	<1.86	<0.61	14.89	0.84	<3.46	<18.63	<109.4	<0.15
9204-5008	<0.1	<0.1	<1.67	<0.82	<13.89	0.83	<3.58	<14.39	<179.5	<0.15
9204-5012	<0.11	<0.09	2.28	<0.66	<17.32	0.54	<4.01	<16.14	<171	<0.18
9204-5016	<0.13	<0.1	<1.95	<0.62	<17.14	0.94	<3.65	14.24	<129.9	<0.13
9205-5004	<0.06	<0.05	<1.73	<0.7	<17.23	0.67	<3.76	<15.52	<147.9	<0.15
9205-5008	<0.09	<0.09	<2.03	<0.6	<14.81	0.64	<4.26	8.54	<142.4	<0.19
9205-5012	<0.11	<0.1	<1.86	0.94	<16.2	0.93	<3.43	<9.18	<147.1	0.16
9205-5012	<0.04	<0.03		1.4 <0.3	<5.3		1.1 <1.2	<4.6	<59	<0.06
9301-5002	<0.01	<0.01	0.9	<0.08	<2.6	0.2	<0.7	<2	<28	<0.03
9302-5002	<0.02	0.04	1.19	<0.14	<3.39	0.54	<0.57	<2.71	<30.83	<0.04
9303-5002	<0.01	<0.02	0.96	<0.14	<3.5	0.52	<0.61	<2.69	<34.74	<0.04
9402-5008	<0.01	<0.01	0.8	<0.1	<2.5	0.3	<0.6	<2.2	<23	<0.03
9403-5001	<0.01	<0.01	0.79	<0.1	<2.12	0.15	<0.5	<1.9	<22.6	<0.02
9403-5004 D	<0.01	0.03	1.45	<0.07	<1.62	0.66	<0.29	<1.34	<15.95	<0.02
9403-5004	<0.02	<0.02	0.79	<0.21	<2.75	0.31	<0.53	<2.45	<25.62	<0.03
9403-5008 D	<0.01	0.02	0.96	<0.06	<1.38	0.37	<0.25	<1.18	<12.59	<0.01
9403-5008	<0.02	0.02	1.3	<0.16	<3.78	0.71	<0.66	<2.86	<37.08	<0.04
9403-5009	<0.02	<0.02	1.05	<0.13	<3.15	0.5	<0.7	<2.63	<30.43	<0.03
9404-5001	<0.01	0.03	1.3	<0.1	<3.2	0.4	<0.8	<2.3	<29.8	<0.03
9404-5004 D	<0.02	0.02	1.1	<0.1	<3.2	0.4	<0.7	<2.6	<28	<0.03
9404-5004	<0.02	<0.01	1.3	<0.1	<3.2	0.4	<0.8	<2.3	<35.9	<0.03
9404-5008	<0.03	<0.05	0.78	<0.26	<5.13	0.23	<1.03	<3.81	80.7	<0.05
9405-5001	<0.02	0.12	1.47	<0.15	<3.5	0.48	<0.63	<2.61	<33.08	<0.04
9405-5009	<0.02	<0.02	1.63	<0.18	<4.11	0.68	<0.75	<2.89	<38.01	<0.04
9901-5007	<0.02	<0.02	0.85	<0.14	<3.21	0.47	<0.66	<2.78	156.2	<0.03
9909-5004	<0.02	<0.02	1.4	<0.14	<3.5	0.59	<0.73	<2.95	<30.61	<0.03
9909-5008	<0.02	<0.02	1.07	<0.12	<2.98	0.41	<0.68	<2.92	141.1	<0.03
9909-5009	<0.02	<0.02	1.72	<0.17	<3.67	0.51	<0.88	<3.95	<32.5	<0.04

PRS 307 RADIOLOGICAL RESULTS
VIA MOUND GAMMA SPECTROSCOPY
10 SAMPLE LOCATIONS ANALYZED

DATE	FILE	ID	TIME	CRH	K	Ca	Ti	CrLO	Mn	Fe	Co	Ni	Cu	Zn	As	Se
8-Sep-95	A090895A	8885-5008	10.784	-881.72	29432	139472	2722.9	-32.126	189.35	25688	156.88	-31.122	1.9095	35.849	37.091	-13.543
8-Sep-95	A090895A	8885-5012	11.148	-1153.8	27077	102894	2117	-56.878	9.1245	26900	-93.26	-43.186	-23.169	24.908	73.167	-21.554
7-Sep-95	A090795A	8886-5001	14.433	-867.35	24579	71286	2542.9	60.205	-114.14	28335	20.15	-12.031	-17.664	77.469	52.077	-11.697
7-Sep-95	A090795A	8886-5004	14.648	-1083.8	19502	61968	2488.4	82.578	326.82	22336	179.45	36.039	-17.605	49.115	76.759	-18.308
7-Sep-95	A090795A	8886-5008	14.936	-862.54	27575	140503	2552.2	-89.729	29.632	26037	220.15	-16.084	-13.794	72.443	63.855	-27.601
7-Sep-95	A090795A	8886-5012	15.142	-781.03	26654	88867	2155.2	21.502	909.11	32528	121.26	-12.306	-53.063	-15.152	65.264	-20.711
29-Aug-95	A082995A	9004-5001	20.154	-601	19061	21117	2771.4	59.756	664.78	25368	-37.035	76.328	-0.68998	57.398	61.691	-26.53
21-Aug-95	A082195A	9005-5001	9.414	-430.61	17119	8675.9	3055.7	5.4447	821.27	24634	163.17	-57.885	-27.31	100.21	31.074	-12.347
21-Aug-95	A082195A	9005-5004	9.623	-567.1	18112	89420	2391.7	93.284	525.3	24096	377.19	-11.473	-13.266	54.839	-17.13	-28.328
21-Aug-95	A082195A	9005-5008	10.517	-547.21	22823	126513	2178.6	127	502.62	24767	410.16	-11.787	-27.863	57.933	-28.082	-23.446
21-Aug-95	A082195A	9005-5011	10.766	-425.93	26880	94474	2438	102.22	533.93	27955	292.25	-28.232	-59.111	54.833	-7.4795	-3.6742
26-Jul-95	A072695A	9101-5001	10.859	-764.75	25605	60126	2334.5	-8.1345	562.89	24719	119.87	-64.375	60.505	61.387	16.97	12.394
26-Jul-95	A072695A	9101-5004	11.111	-683.02	20580	80380	2173.3	-47.572	423.56	22920	133.8	-41.927	60.949	66.277	42.669	8.3169
26-Jul-95	A072695A	9101-5008	11.351	-763.57	34480	63852	3114.4	-107.03	481.06	29852	142.92	-48.088	45.66	59.458	22.793	14.489
26-Jul-95	A072695A	9101-5012	11.658	-570.64	35418	56964	3073.6	-88.939	623.33	31366	179.8	-1.3186	63.226	128.74	13.675	18.922
26-Jul-95	A072695A	9101-5014	14.239	-420.53	36537	69692	3306.9	-154.09	758.37	31122	229.75	-141.43	37.114	75.087	26.33	18.082
26-Jul-95	A072695A	9103-5001	13.33	-648.74	29475	56477	2493.1	65.984	417.99	27633	124.22	24.759	17.017	80.014	16.634	16.062
26-Jul-95	A072695A	9103-5004	14.634	-507.67	19508	89341	1996.3	-65.417	445.63	20354	-127.04	-17.1	12.413	84.661	33.506	5.3087
26-Jul-95	A072695A	9103-5008	14.853	-853.19	30536	71916	2864.1	-85.005	708.91	27232	55.033	-61.324	51.292	69.528	36.574	28.338
26-Jul-95	A072695A	9103-5012	15.067	-691.91	34404	55833	3026.6	-72.343	917.46	28139	3.9561	-66.457	18.807	44.668	31.752	20.858
26-Jul-95	A072695A	9101-5012	13.548	-502.78	32261	62316	2796.6	-30.432	365.01	28751	-115.4	-12.61	29.792	104.96	13.185	14.288
30-Aug-95	A083095A	9104-5001	14.057	-656.42	24131	56820	2200.9	50.32	375.08	24054	-40.507	-25.157	-10.908	47.281	53.816	-26.225
30-Aug-95	A083095A	9104-5004	14.261	-724.19	15083	85993	1476.3	58.606	-333.43	18673	-18.717	19.603	-9.9593	66.636	59.038	-9.9776
30-Aug-95	A083095B	9104-5008	15.882	-543.46	23532	66638	2296.8	24.672	308.13	22162	156.27	36.711	23.093	38.117	77.045	-29.357
30-Aug-95	A083095B	9104-5012	16.094	-847.52	32863	68029	2437.7	11.069	440.48	27959	178.18	16.035	-1.7318	24.835	77.629	-29.023
29-Aug-95	A082995A	9105-5001	14.98	-504.37	24466	70020	2369.5	229.98	587.32	24549	152.34	-150.63	-45.795	27.205	84.481	-26.095
29-Aug-95	A082995A	9105-5004	15.191	-343.61	17243	83455	1797.6	120.2	185.76	19034	128.84	-117.64	-17.582	44.041	52.882	-30.104
29-Aug-95	A082995A	9105-5008	15.397	-212.3	29921	80325	2712.9	87.434	572.46	26760	405.42	-106.34	-20.93	63.097	36.225	30.205
29-Aug-95	A082995A	9105-5012	15.602	-21.008	33569	54713	2870.1	130.43	524.71	30595	109.25	-38.335	-30.714	-7.2702	65.947	-35.997
29-Sep-95	A092995A	9106-5001	15.479	-835.32	28502	66045	2452.1	48.748	1190.3	26309	103.76	-148.33	-122.57	97.244	66.95	-19.63
29-Sep-95	A092995A	9106-5004	15.901	-467.93	29548	81521	2706.7	-38.643	484.05	27740	354.12	-181.26	-63.881	51.428	68.611	-19.127
29-Sep-95	A092995A	9106-5008	16.113	-676.73	22712	89838	2124.8	-58.965	493.68	19873	93.837	-141.2	-58.565	67.443	52.657	-21.513
29-Sep-95	A092995A	9106-5001	15.693	-948.61	30441	74250	2647.6	-8.5676	533.57	27328	-112.51	-147.9	-108.78	85.176	41.68	-25.87
29-Sep-95	A092995A	9107-5001	16.333	-973.81	31104	100209	2661.2	-52.036	715.33	26888	-126.85	-103.43	-112.83	85.089	66.849	-16.506
29-Sep-95	A092995A	9107-5004	16.989	-454.94	26299	139530	2461.1	-105.65	461.2	24522	449.95	-182.38	-59.172	89.815	37.33	-16.537
29-Sep-95	A092995A	9107-5008	17.206	-692.64	23095	105790	2424.3	-51.048	77.638	21597	-40.822	-150.74	-69.004	54.49	50.496	-12.933
29-Sep-95	A092995A	9108-5001	17.47	-792.29	35940	65825	3146	10.504	660.71	30868	27.138	-146.66	-63.821	52.177	61.942	-14.732
29-Sep-95	A092995A	9108-5004	17.779	-1032.9	23123	95304	1943.1	-101.27	793.92	21848	-253.33	-183.67	-54.728	80.161	51.233	-21.738
29-Sep-95	A092995A	9108-5008	17.981	-787.45	18035	93858	2120.5	47.915	275.79	18853	38.704	-118.47	-51.493	64.908	50.185	-10.505
27-Jul-95	A072795A	9201-5001	15.636	-900.33	6340.6	140293	1118.9	63.381	183.29	9198.8	-17.086	-85.963	-21.687	56.768	-9.501	11.3
27-Jul-95	A072795A	9201-5004	15.862	-590.81	26918	86116	2593.2	-68.081	918.07	27360	-37.814	-16.107	35.649	55.037	12.721	10.23
27-Jul-95	A072795A	9201-5016	16.113	-707.45	30834	92408	3001.2	-44.948	685.53	29243	187.75	-44.867	9.0759	69.347	40.148	31.331
26-Jul-95	A072695A	9202-5008	15.296	-661.21	32055	85081	3279.7	-161.36	932.53	34705	166.24	-21.2	69.454	87.215	13.8	22.06
26-Jul-95	A072695A	9202-5012	15.508	-371.11	28254	102377	3072.6	-131.46	639.87	28954	315.63	-51.943	74.819	43.432	50.648	9.0408
26-Jul-95	A072695A	9203-5004	15.759	-764.75	17262	140481	1675.5	-164.38	363.42	17889	-106.05	12.008	24.159	32.851	20.088	18.101
26-Jul-95	A072695A	9203-5008	16.069	-498.24	27746	119687	2739.5	-141.26	779.01	28160	153.81	-55.053	39.541	76.627	18.604	19.565
26-Jul-95	A072695A	9203-5012	16.306	-714.59	33006	85217	3133.5	-174.2	717.63	30818	70.049	53.852	51.172	104.38	4.2323	12.261
26-Jul-95	A072695A	9203-5016	16.528	-725.57	28414	127517	2785.5	-110.46	947.1	28311	83.414	-33.105	42.008	106.9	54.163	17.277
27-Jul-95	A072795A	9203-5020	10.325	-507.6	16097	166083	1635.6	-62.093	632.69	20500	113.92	91.248	44.917	55.69	30.171	17.761
26-Jul-95	A072695A	9203-6016	16.811	-531.11	27811	130616	2754.9	-154.8	519.55	27042	24.427	-60.453	20.241	66.663	18.316	10.077
27-Jul-95	A072795A	9204-5004	10.657	-540.35	26127	90153	2522.7	-27.141	430.26	26029	169.86	-17.923	22.776	78.024	21.176	14.162
27-Jul-95	A072795A	9204-5008	10.975	-976.06	34567	69561	3399	-156.86	1279.7	34863	240.73	-9.5634	58.479	105.89	31.131	15.755
27-Jul-95	A072795A	9204-5012	12.588	-903.96	21213	139584	2093.9	-144.82	811.85	22885	-68.209	-15.213	31.32	88.718	31.748	7.4819
27-Jul-95	A072795A	9204-5016	12.81	-342.97	26006	106973	2467.3	-151.37	834.44	26877	-53.542	-9.7097	-1.4589	94.625	35.597	21.884
27-Jul-95	A072795A	9205-5004	15.414	-363.11	31333	70178	2870.7	-13.124	1018.3	28024	233.67	-77.074	80.177	46.779	47.42	7.0544
29-Aug-95	A082995A	9301-5002	18.569	-403.95	12904	137515	1401.8	229.11	361.92	13060	221.94	-22.285	-37.587	18.01	66.626	-30.599
29-Aug-95	A082995A	9302-5002	19.302	-556.6	25815	94973	2639.7	95.086	190.45	23034	125.21	23.186	27.172	9.8414	51.225	-3.9812
29-Aug-95	A082995A	9302-6002	19.512	-662.49	28116	95910	2823.3	-30.057	266.31	24798	258.64	-16.496	-15.027	53.161	59.786	-19.623
29-Aug-95	A082995A	9303-5002	19.729	-550.32	22922	94452	2286.3	-28.928	349.35	20102	137.45	89.653	-34.611	311.67	40.58	-24.34
10-Sep-95	A091095A	9401-5001	16.016	-511.68	7424.5	137331	959.66	-13.654	49.744	8540.5	-57.417	-70.013	43.873	14.22	13.969	12.722
10-Sep-95	A091095A	9401-5002	16.629	-455.42	6712.7	161426	722.22	-110.38	320.56	10135	-279.3	-36.6	15.49	69.874	5.2179	14.306
30-Aug-95	A083095B	9403-5001	18.94	-774.05	5866.6	207202	219.74	27.969	-359.23	8626.9	-44.51	6.5251	-41.88	-18.376	45.167	-12.544
30-Aug-95	A083095B	9403-5004	19.163	-763.4	5488.9	210832	178.55	-2.5127	47.852	5307.8	-43.963	25.474	-17.299	-18.714	45.426	-26.883
30-Aug-95	A083095B	9403-5008	19.383	-901.62	28											

**Mound ER Program
Investigation-Specific Planned Change Notification (ISPCN)**

ISPCN No.: 038 Investigation/Activity: Other Soils
(Task Project Manager Assigns) Work Order No.: 05376-046-003

Document/Plan/Procedure: SAP

Section: 3.2.2 Addendum 1

Document Date: June 1994

Revision No.: Final

(Rev. 1)

Effective Date From: 07/17/95 To: end of project

PRS 307

Description and Justification of Change: Due to the presence of underground utilities at Hotspot C0007, the historic location was sampled to only 2 feet. Location 9402 was moved 1 foot North, 9403 was moved to a point 14' SW of the historic location, 9405 was moved to a point 33 feet S-SW of the historic location, 9406 was moved to a point 23 feet E-NE of the historic location.

Budget Impact ? (Y/N) No

Approximate Cost (\$):

Follow-up/Actions:

Approval:

Task Project Manager: *J. S. [Signature]* Date: 8/18/95

Distribution:

- | | | | |
|-------------------------|--------------------------|---------------------------|--------------------------|
| Program Manager | <input type="checkbox"/> | Technical Manager | <input type="checkbox"/> |
| Alternate Project Mgr. | <input type="checkbox"/> | Quality Assurance Officer | <input type="checkbox"/> |
| Project File Code 6.2.1 | <input type="checkbox"/> | Other: _____ | <input type="checkbox"/> |

DRAFT
**OTHER SOILS
CHARACTERIZATION
REPORT**

Volume II – Appendices

**MOUND PLANT
MIAMISBURG, OHIO**

JANUARY 1996

**U.S. DEPARTMENT OF ENERGY
OHIO FIELD OFFICE**

**DECONTAMINATION AND DECOMMISSIONING PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES**

124
1995-01-27

CLIENT/SUBJECT C0007 94XX 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		Fidler		α	B	Organics		Metals
		(25) Plutonium	(15) Thorium	(1K) channel 1	(5K) channel 2			OVA	OVM	
1	9401-5001	---	---	---	---	---	---	---	---	---
2	5002	---	---	---	---	---	---	---	---	---
3	9402-5001	---	---	---	---	---	---	---	---	---
4	5004	---	---	---	---	---	---	---	---	---
5	5008	---	---	---	---	---	---	---	---	---
6	5009	---	---	---	---	---	---	---	---	---
7	9403-5001	---	---	---	---	---	---	---	---	---
9	5004	---	---	---	---	---	---	---	---	---
9	5008	---	---	---	---	---	---	---	---	---
10	5009	---	---	---	---	---	---	---	---	---
11	9404-5001	---	---	---	---	---	---	---	---	---
12	5004	---	---	---	---	---	---	---	---	---
13	5008	80.7	---	---	---	---	---	---	---	---
14	5009	---	---	---	---	---	---	---	---	---
15	9405-5001	---	---	---	---	---	---	---	---	---
16	5004	---	---	---	---	---	---	---	---	---
17	5008	---	---	---	---	---	---	---	---	---
18	5009	---	---	---	---	---	---	---	---	---

**THIS IS THE DATA FIELD DATA SHEET
INDICATING THE 18 SAMPLE LOCATIONS
TAKEN FOR ANALYSIS OF PRS 307**

**DASH LINES UNDER THE FIDLER AND ORGANICS
COLUMNS INDICATE THAT READING WAS NOT
DISTINGUISHABLE FROM BACKGROUND**

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 ⁻³	GV for TR=10 ⁻⁶	GV for HI=1	GV for TR=10 ⁻⁴	GV for TR=10 ⁻³	GV for TR=10 ⁻⁶	GV for HI=1	GV for TR=10 ⁻⁴	GV for TR=10 ⁻³	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 ⁻³	GV for TR=10 ⁻²	GV for HI=1	GV for TR=10 ⁻⁴	GV for TR=10 ⁻³	GV for TR=10 ⁻²	GV for HI=1	GV for TR=10 ⁻⁴	GV for TR=10 ⁻³	GV for TR=10 ⁻²	GV for HI=1
Tribromomethane	3.75e+04	3.75e+03	3.75e+02	2.15e+04	8.00e+09	8.00e+08	8.00e+07		3.75e+04	3.75e+03	3.75e+02	
Trichloroethylene	2.70e+04	2.70e+03	2.70e+02		2.20e+03	2.20e+03	2.25e+02		2.20e+03	1.25e+03	1.25e+02	
Trichlorofluoromethane				3.20e+05				3.65e+03				3.65e+03
Trichloromethane	4.90e+04	4.90e+03	4.90e+02	1.05e+04	1.55e+03	1.55e+02	1.55e+01		1.55e+03	1.55e+02	1.55e+01	
Xylene				2.15e+06								
bis(2-Ethylhexyl)phthalate	2.15e+04	2.15e+03	2.15e+02	2.15e+04								
PAHs												
Acenaphthylene												
Anthracene				3.20e+05								
Benzo(a)anthracene	4.10e+02	4.10e+01	4.10e+00									
Benzo(a)pyrene	4.10e+01	4.10e+00	4.10e-01									
Benzo(b)fluoranthene	4.10e+02	4.10e+01	4.10e+00									
Benzo(g,h,i)perylene												
Benzo(k)fluoranthene	4.10e+03	4.10e+02	4.10e+01									
Dibenz(a,h)anthracene	4.10e+01	4.10e+00	4.10e-01									

Mound Plant
Draft Rev. 3Risk -Based Guideline Values Report
December 1995

Environmental Restoration Program

Duplicate
EG+G-29-01-10-05-0
9506050038

Operable Unit 9 Hydrogeologic Investigation: Groundwater Sweeps Report

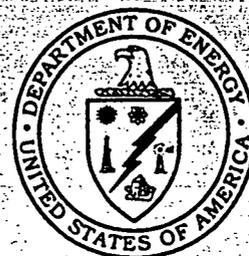
**MOUND PLANT
MIAMISBURG, OHIO**

April 1995

**Technical Memorandum
(Revision 1)**

**U.S. Department of Energy
Ohio Field Office**

EG&G Mound Applied Technologies



GROUNDWATER QUALITY DATA BY LOCATION
 SITE: SWP98 GROUNDWATER SWEEPS
 LOCATION: 0322
 NORTH COORDINATE: 598865.46 FT
 EAST COORDINATE: 1497201.16 FT
 09/10/93 TO 10/15/93
 REPORT DATE: 04/03/95

FORMATION OF COMPLETION: SHALE (SH)
 HYDRAULIC FLOW RELATIONSHIP: ON SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	LAB VALUE	PVI	VALIDATED VALUE	RUN TYPE
RADIUM-226	09/27/93	0001	PCI/L		1.35		1.35	I
SODIUM, SOLUBLE	09/27/93	0001	UG/L		128000.	J	128000.	I
SODIUM, TOTAL	09/27/93	0001	UG/L		113000.	J	113000.	I
SULFATE	09/27/93	0001	MG/L		85.5		85.5	I
THORIUM-228	09/27/93	0001	PCI/L		.607		.607	I
TIN, SOLUBLE	09/27/93	0001	UG/L	B	12.1		12.1	I
TIN, TOTAL	09/27/93	0001	UG/L	B	20.4		20.4	I
TOTAL DISSOLVED SOLIDS	09/27/93	0001	MG/L		659.		659.	I
TOTAL KJELDAHL NITROGEN	09/27/93	0001	MG/L		2.3		2.3	I
TOTAL PHOSPHATE	09/27/93	0001	MG/L		0.22		0.22	I
TOTAL SUSPENDED SOLIDS	09/27/93	0001	MG/L		9.0		9.0	I
URANIUM-234	09/27/93	0001	PCI/L		.266		.266	I
URANIUM-238	09/27/93	0001	PCI/L		.133		.133	I
VANADIUM, SOLUBLE	09/27/93	0001	UG/L	B	6.8	J	6.8	I
VANADIUM, TOTAL	09/27/93	0001	UG/L		11.1	J	11.1	I
ZINC, TOTAL	09/27/93	0001	UG/L		71.0	J	71.0	I

PARAMETER VALUE INDICATOR (PVI): U - LESS THAN DETECTION LIMIT

GROUNDWATER QUALITY DATA BY LOCATION
 SITE: SWP98 GROUNDWATER SWEEPS
 LOCATION: 0322
 NORTH COORDINATE: 598865.46 FT
 EAST COORDINATE: 1497201.16 FT
 09/10/93 TO 10/15/93
 REPORT DATE: 04/03/95

FORMATION OF COMPLETION: SHALE (SH)
 HYDRAULIC FLOW RELATIONSHIP: ON SITE (O)

PARAMETER NAME	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	LAB VALUE	PVI	VALIDATED VALUE	RUN TYPE
ALUMINUM, SOLUBLE	09/27/93	0001	UG/L		70.5		70.5	I
ALUMINUM, TOTAL	09/27/93	0001	UG/L		4680.	J	4680.	I
AMMONIA	09/27/93	0001	MG/L		2.6		2.6	I
ANTIMONY, SOLUBLE	09/27/93	0001	UG/L	B	1.0	J	1.0	I
BARIUM, SOLUBLE	09/27/93	0001	UG/L	B	23.8		23.8	I
BARIUM, TOTAL	09/27/93	0001	UG/L	B	25.5		25.5	I
BERYLLIUM, TOTAL	09/27/93	0001	UG/L	B	0.27		0.27	I
CALCIUM, SOLUBLE	09/27/93	0001	UG/L		46300.	J	46300.	I
CALCIUM, TOTAL	09/27/93	0001	UG/L		52300.	J	52300.	I
CHLORIDE	09/27/93	0001	MG/L		81.8		81.8	I
CHROMIUM, TOTAL	09/27/93	0001	UG/L		13.4		13.4	I
COBALT, TOTAL	09/27/93	0001	UG/L	B	4.3		4.3	I
COPPER, SOLUBLE	09/27/93	0001	UG/L	B	1.1		1.1	I
COPPER, TOTAL	09/27/93	0001	UG/L	B	6.4		6.4	I
FLUORIDE	09/27/93	0001	MG/L		2.4		2.4	I
IRON, SOLUBLE	09/27/93	0001	UG/L	B	75.5		75.5	I
IRON, TOTAL	09/27/93	0001	UG/L		6950.	J	6950.	I
LITHIUM, SOLUBLE	09/27/93	0001	UG/L	B	67.7		67.7	I
LITHIUM, TOTAL	09/27/93	0001	UG/L	B	67.7		67.7	I
MAGNESIUM, SOLUBLE	09/27/93	0001	UG/L		30100.	J	30100.	I
MAGNESIUM, TOTAL	09/27/93	0001	UG/L		29600.	J	29600.	I
MANGANESE, SOLUBLE	09/27/93	0001	UG/L		24.5		24.5	I
MANGANESE, TOTAL	09/27/93	0001	UG/L		163.	J	163.	I
MOLYBDENUM	09/27/93	0001	UG/L		26.8		26.8	I
MOLYBDENUM, SOLUBLE	09/27/93	0001	UG/L		32.4		32.4	I
NITRATE NITRITE	09/27/93	0001	MG/L		0.054		0.054	I
PLUTONIUM-239/240	09/27/93	0001	PCI/L		.128		.128	I
POTASSIUM, SOLUBLE	09/27/93	0001	UG/L		15600.		15600.	I
POTASSIUM, TOTAL	09/27/93	0001	UG/L		14800.		14800.	I

PARAMETER VALUE INDICATOR (PVI): U - LESS THAN DETECTION LIMIT

Environmental Restoration Program

**OPERABLE UNIT 9,
HYDROGEOLOGIC INVESTIGATION:
WELL INFORMATION REPORT**

**MOUND PLANT
MIAMISBURG, OHIO**

January 1994

**Technical Memorandum
(Revision 1)**

**U. S. Department of Energy
Albuquerque Operations Office**

**Environmental Restoration Program
EG&G Mound Applied Technologies**



WESTON

GEOLOGIC LOG		MOUND - OU9		Project Manager GORDON HORN		PAGE: 1 of 3	
Drilling Company		NORTH STAR DRILLING		Borehole/Well Id		0322	
Drilling Method		ROTONSONIC DRILL		STATE PLANE COORDINATES			
Drilling Fluid		WATER		North (ft)		598865.46	
Date Started		3/30/93		East (ft)		1497201.16	
Date Completed		4/1/93		Ground Surface Elev. (ft)		809.84	
Logged By		DALE FLORES		Top of Casing Elev. (ft)		811.61	
Checked By		PAUL DARR		Total Depth (ft)		55.0	
Comments:		West of gate 8 and north of asphalt lined pond.					

Depth	Sample			Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	T	A	ID					
0	B	GC	0005	Casing: Stainless steel, 4"			TS	0.0 to 0.6' - Dark yellowish brown (10Y 4/2) sandy silt, moist. Topsoil.
5	B	GC	0006	Backfill: Cement - bentonite grout			FL	0.5 to 2.0' - Light olive (5Y 3/2) silty clay, trace brown staining, stiff, ~20% angular limestone clasts, slightly moist. Probable fill. 2.0 to 4.0' - Moderate yellow brown (10YR 5/4) silty, sandy gravel, trace of olive clay, 20% angular to subangular gravel 7" maximum size. Probable fill. 4.0 to 8.0' - Variegated from moderate olive brown (5Y 4/4) to moderate yellow brown (10YR 5/4) gravelly clayey silt, dense, ~10% angular gravel, dry to slightly moist. Probably fill.
10	B	GC	0012				ML	8.0 to 10.0' - Dark yellow brown (10YR 5/4) sandy silt, trace of angular gravel up to 2", dense, piece of concrete at 10', slightly moist to moist, slight petroleum odor. Fill. 10.0 to 12.0' - Greenish black (5GY 2/1) clayey silt, trace gravel, moderate plasticity, moist, slight petroleum odor. Probable old topsoil.
15	B	GC	0020				ML	12.0 to 15.0' - Moderate yellow brown (10YR 5/4) sandy silt, non-plastic, moist. Outwash.
20							TI	15.0 to 20.0' - Moderate yellow brown (10YR 5/4) sandy silt, ~10% angular to subangular to 1", stiff, moist. Sandy till.

GROUNDWATER		
DEPTH	HOUR	DATE
49.20	12:32	03/31/93
26.67	16:38	05/19/93

GEOLOGIC LOG

MOUND - OU9

Project Manager
GORDON HORN

PAGE:
2 of 3

Borehole/Well Id 0322

Depth	Sample			Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	T	A	ID					
20	B	GC	0025				TI	20.0 to 42.5' - Olive gray (5Y 3/2) sandy silt, ~10% angular to subangular gravels to 1", slightly moist to moist. Sandy till.
25	B	GC	0030					
30	B	GC	0035					
35	B	GC	0040					
40	B	GC	0045	Seal: 1/4" Bentonite chips				
45	B	GC	0050	Filter Pack: 10/20 Colorado silica sand			SH	42.5 to 55.0' - Medium gray (N4) silty fissile shale, thin (1/2 - 1") interbeds of fossiliferous limestone, dry, crumbly.

GROUNDWATER

DEPTH	HOUR	DATE
49.20	12:32	03/31/93
26.67	16:38	05/19/93

