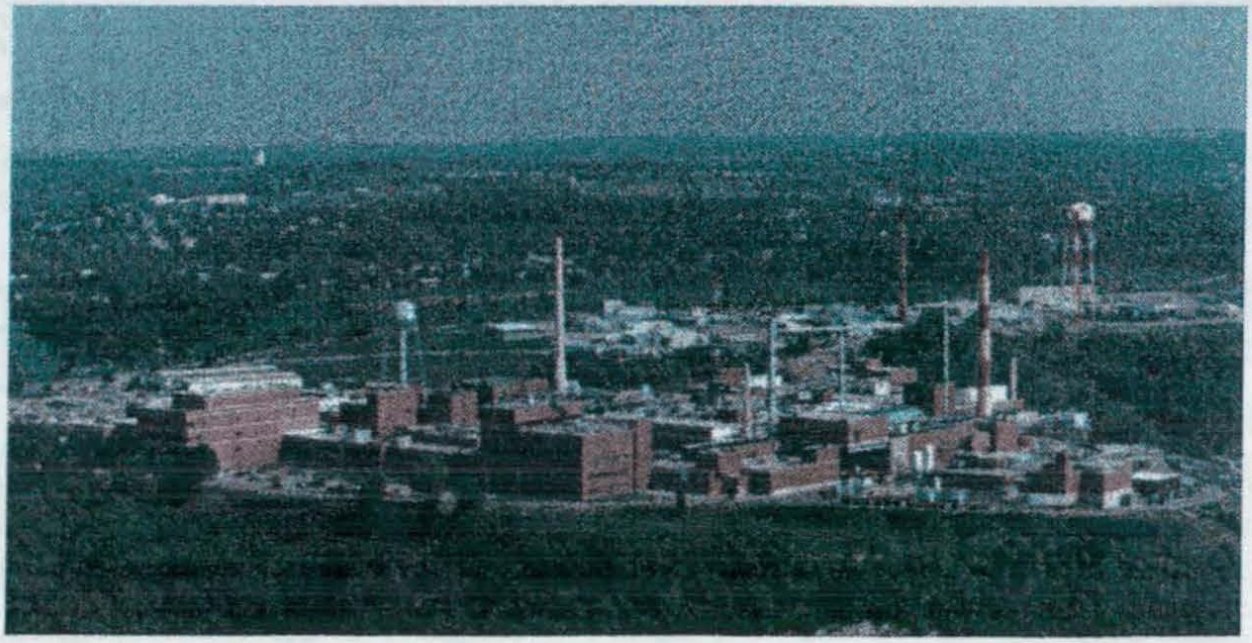
EG&G MOUND-30-03-03-03--9705080025

MOUND

Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 304/313



PRS 304/313

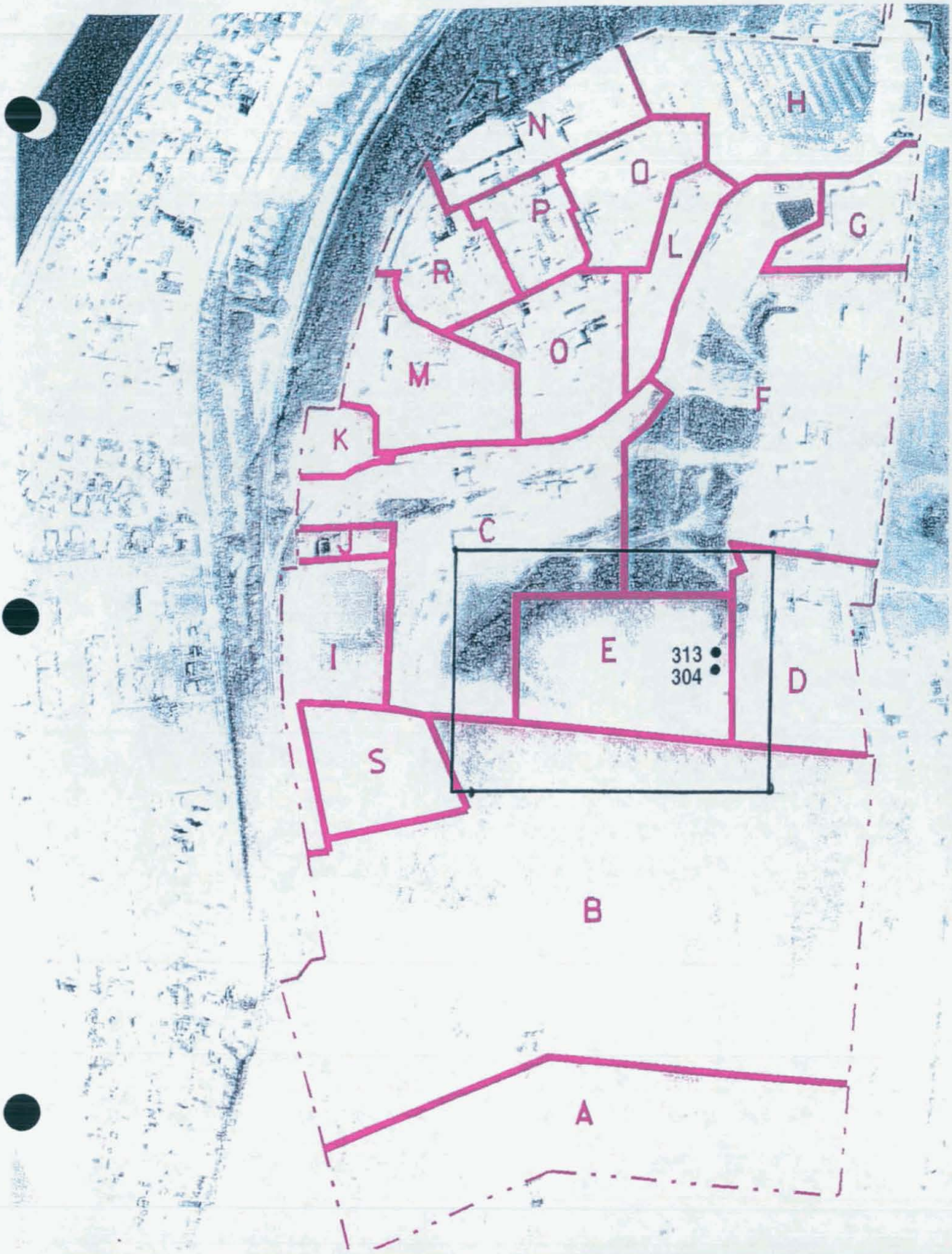
REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comments.	Mar. 19, 1997
FINAL 1		

MOUND PLANT

Release Block E

Potential Release Site

PRS 304/313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MOUND PLANT

Release Block E

Potential Release Site

PRS 304/313

313
304

PRS 304/313

PRS HISTORY:

PRS 304 and PRS 313 are neighboring soils PRSs located approximately 300 feet southwest of Building 105. The PRS 304 soils area (also known as the Excavated Materials Disposal Area and as Raider's Hill) was created due to the dumping of low level thorium soils (less than 5 pCi/g). PRS 313 was created due to a thorium hot spot identified during the Radiological Site Survey Project.

The PRS 304/313 soils area contains the overburden soils excavated from the decommission and decontamination (D&D) of the Waste Transfer Line (PRS 300) and from Area 12 (PRS 273). Soils from these areas were segregated according to thorium contamination concentration. Soils with thorium concentrations greater than 5 pCi/g (5 pCi/g is the guideline criteria for surface thorium removal) were boxed and shipped for off-site disposal; those soils with less than 5 pCi/g of thorium were dumped in the area of PRS 304/313.

CONTAMINATION:

1) In 1984, the Radiological Site Survey Project took one surface sample at the location of PRS 313. Thorium was detected at 15 pCi/g (the guideline value for thorium-232 is 5 pCi/g).[1,2,7] Plutonium-238 was detected at 0.43 pCi/g (the ALARA guideline criteria for plutonium-238 is 25 pCi/g).[1,2]

2) In 1984, approximately 52 soil samples (15 boring locations) were collected from the area of PRS 304 and analyzed by the Mound Plant soil screening facility.[2] Results indicate:

Contaminant	Maximum Concentration Detected	Guideline Criteria
Plutonium-238	34.4 pCi/g [ref 2] (in soil @ 12.5 feet)	25 pCi/g (Mound ALARA in soil)
Thorium-232	1.2 pCi/g [ref 2] (in subsurface soil)	15 pCi/g [ref 4] (in subsurface soil)

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

3) In 1994, the OU5, Operational Area Phase I Investigation Non-AOC Field Investigations[3] included the PRS 304/313 area. This investigation included a field instrument for detection of low-energy radiation (FIDLER) survey; surface soil sampling and analysis using the Mound Plant soil screening facility; and a PETREX passive soil gas survey to detect volatile and semi-volatile organic compounds. The survey was conducted over a 100-foot grid system. The results of the PETREX passive soil gas survey indicated moderately elevated detections of total semi-volatile hydrocarbons relative to surrounding PETREX sampling location.[3] No relatively elevated detections of halogenated, aromatic, or petroleum hydrocarbons were found.[3] The PETREX soil gas methods generally indicate the relative presence of a substance, but do not yield a quantitative concentration of that substance.

Results of soil samples analyzed by the Mound soil screening facility found no plutonium-238 or thorium-232 occurs in concentrations above the guideline criteria (25 pCi/g for plutonium and 5 pCi/g [surface to 15 cm in depth] for thorium).[3, 7]

4) In 1995, the Other Soils Characterization project sampled the location of PRS 313 and four surrounding locations approximately 10 feet from PRS 313. Soil samples were analyzed for organics (by organic vapor and/or organic vapor meter), metals (by X-ray fluoroscope) and radionuclides (field detection by FIDLER and lab analysis by Mound soil screening).[4, 8] Sample depth was from 0 to 3 feet.[5] The sampling analysis found:
   No radioactive contamination was detected in excess of guideline criteria.[4, 5, 6, 7]
   No organics were detected above background levels.[4, 5]
   No metal contamination was detected above the 10^{-6} Risk Based Guideline Values.[4, 5, 6]

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, Final, December 1994. (pages 6-8)
2) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993. (pages 9-16)
3) OU5, Operational Area Phase I Investigation Non-AOC Field Report, June 1995. (pages 17-23)
4) Other Soils Characterization Report Vol I - Text, Final, May 1996. (pages 24-28)
5) Other Soils Characterization Report Vol II - Appendices, Final, May 1996. (pages 29-31)

OTHER REFERENCES:

6) Risk Based Guideline Values, Mound Plant, Final, (Revision 3), December 1995.
7) Code of Federal Regulations, 40 CFR 192.12 and 40 CFR 192.41.
8) Data from Mound Soil Screening Lab from Other Soils Characterization Samples. (pages 31.1, 31.2)

PREPARED BY:

George Liebson, Member of the EG&G Technical Staff
Eric Horstman, Member of the EG&G Technical Staff
John Nichols, Member of the EG&G Technical Staff

SUPPLEMENTAL DATA
PRS 304/313

CONTAMINATION:

In 1996, the ***Soil Gas Confirmation Sampling***[8] investigation sampled the PETREX soil gas locations with the highest PETREX ion counts in the southern quadrant of the Mound plant These locations were *Soil Gas Confirmation* samples numbers 15, 16, and 17 which correspond to PETREX sample locations 239, 219 and 25.

PRSs 304 and 313 were not sampled as part of the *Soil Gas Confirmation Sampling* but had lower southern quadrant ion counts than the locations that were sampled. Hence, the *Soil Gas Confirmation* results for the PETREX locations with the highest ion counts in Mound's southern quadrant provide correlating evidence about the risk of contamination at other southern quadrant locations with similar or lower ion counts (i.e. PRSs 304 and 313). The map on page 35 shows the location of PRSs 304 and 313 in relation to *Soil Gas Confirmation Sampling* locations 15, 16, and 17.

The following table lists both the maximum qualitative PETREX ion counts in Mound's southern quadrant and the corresponding quantitative *Soil Gas Confirmation* sampling results. The table also compares these results to the qualitative PETREX ion counts for PRSs 304 and 313.

PETREX Soil Gas Contaminant Family	Maximum Ion Counts[3]	Confirm Sample #	Confirmation Sample Results that Exceed Guideline Criteria (GC)[ref 8]	Maximum Ion Counts in the vicinity of PRSs 304 and 313[ref 3]
Total Aromatic Hydrocarbons	4,568,544	(#15)	None	583,402
Total Semivolatile Hydrocarbons	71,014	(#16)	None	20,316
Total C5-C11 Petroleum Hydrocarbons	8,946,541	(#15)	None	924,070
Total Halogenated Hydrocarbons	2,481,563	(#17)	None	Not Detected

The correlations made above make no conclusions about individual contaminant concentrations at PRSs 304 and 313 only that the overall health risk from PRSs 304 and 313 is expected to be similar to or less than that of the PETREX locations with the highest measured ion counts.

REFERENCES:

8) Soil Gas Confirmation Sampling, May 1996. (pages 32-41)

MOUND PLANT
PRS 304/313
DISPOSAL SITE FOR CONTAMINATED SOILS – AREA SOUTHWEST OF BUILDING 105

RECOMMENDATION:

PRS 304 and PRS 313 are neighboring soils PRSs located approximately 300 feet southwest of Building 105. The PRS 304 soils area was created due to the dumping of low level thorium soils. PRS 313 was created due to a thorium hot spot identified during the Radiological Site Survey Project.

Soils from on-site removal actions with thorium concentrations greater than 5 pCi/g (5 pCi/g is the guideline criteria for surface thorium removal.) were boxed and shipped for off-site disposal; those soils with less than 5 pCi/g of thorium were put in PRS 304/313.

Sampling in 1984 at PRS 304 found plutonium and thorium below 10^{-5} Risk Based Guideline Values. Results from sampling in 1995 at PRS 313 and four locations approximately 10 feet from PRS 313 indicated no radioactive contamination in excess of guideline criteria, no organic contamination detected above background level or any metal contamination detected above 10^{-6} Risk Based Guideline Values.

Therefore, NO FURTHER ASSESSMENT is recommended for PRSs 304 and 313.

CONCURRENCE:

DOE/MEMP: Arthur Kleinrath 2/19/97
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 2/19/97
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 2/19/97
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

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

REFERENCE MATERIAL
PRS 304/313

Document Control No. _____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

December 1994

Final

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

				Operational Jurisdiction				Historic Activities			
No.	Site Name	Location	Status	Regulated Units	Regulatory Authority	Spill Response	SWMU	Evidence Of Release	Response Authority	Further Action Recommended	FFA OU
299	Building 38 Diesel Fuel Storage Tank (Tank 121)	G-9	In Service		BUSTR	BUSTR		No	BUSTR	OM	
300	Area 19, Underground Waste Transfer Line	G-6 G-7 G-8 G-9	Historical		NA		SWMU	Yes	AEA	Yes	6
301	Building 38 In-Line Incinerator	G-9	Historical		NA		SWMU	No	AEA	No	
302	Area D, Acid Leach Field	H-8 H-9 G-8 G-9	Historical		AEA		SWMU	No	AEA	Yes	6
303	Warehouse 14 (AKA Pad 14)	G-9	Grounds		AEA			No	AEA	No	
304	Excavated Materials Disposal Area (AKA Rader's Hill)	I-8	Grounds	runoff to overflow pond	AEA			No	CERCLA	Yes	5
305	SM Stack	G-9	Surplus		NA			No	AEA	Yes	6
306	SM/PP Hill Seep 0609	L-9	NA		AEA			No	CERCLA	Yes	5
307	Site Survey Project Potential Hot Spots Location C0007	E-9	Grounds		AEA			Yes	AEA	Yes	6
308	Site Survey Project Potential Hot Spots Location C0028	F-10	Grounds		AEA			Yes	AEA	Yes	6
309	Site Survey Project Potential Hot Spot Location S0307	F-9	Grounds		AEA			Yes	AEA	Yes	6
310	Site Survey Project Potential Hot Spot Location S0647	H-9	Grounds		AEA			Yes	AEA	Yes	6
311	Site Survey Project Potential Hot Spot Location S0706	I-6	Grounds		AEA			Yes	CERCLA	Yes	5
312	Site Survey Project Potential Hot Spot Location S0971	J-9	Grounds		AEA			Yes	CERCLA	Yes	5
313	Site Survey Project Potential Hot Spot Location S0982	I-8	Grounds		AEA			Yes	CERCLA	Yes	6
314	Farm Trash Area	M-8	Historical		AEA		SWMU	No	CERCLA	No	5

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

Reference List

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

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

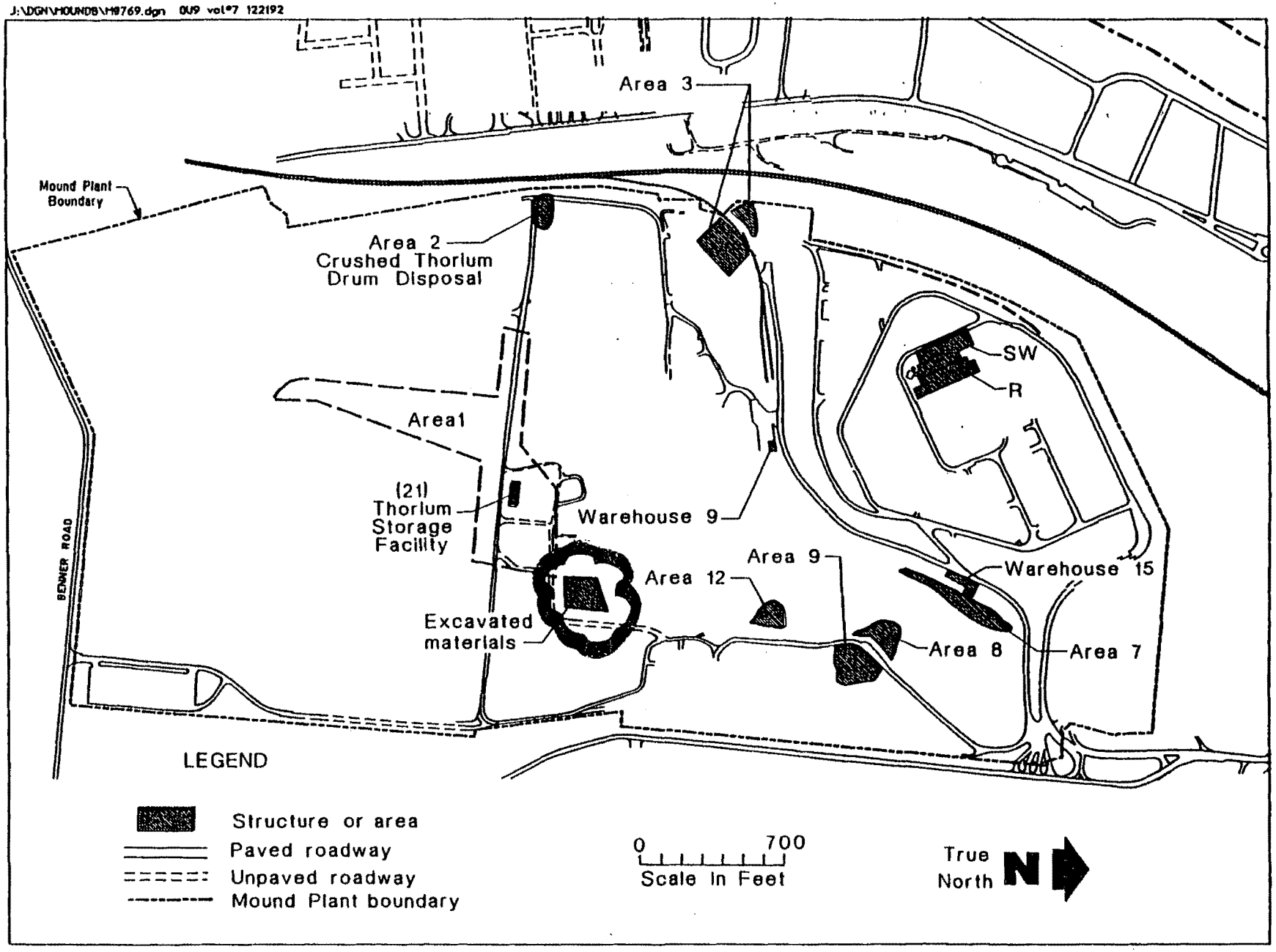


Figure 5.1. Thorium ore processing areas.

Sample locations S0472 and S1092, shown on Plate 1 as possible hot spots, are probably not associated with the thorium project, as S1092 is largely thorium-230 and is associated with Area 23, described in a companion section of this report.

5.10. EXCAVATED MATERIALS DISPOSAL AREA

The excavated materials disposal area is located on the SM/PP Hill adjacent to Area 1 and south of the water tower (Figure 5.1). The area is colloquially known as Rader's Hill. The area contains the overburden soils excavated during the D&D of the waste transfer line on the west slope of the SM/PP Hill. The excavation is known as Area 19. The excavation overlapped the southern margin of Area 12, known to be contaminated with thorium. During excavation, soils that had thorium concentrations were staged and later segregated depending on the thorium concentrations. Soil with thorium concentration greater than 5 pCi/g were boxed for offsite disposal and those with less were moved to the excavated materials disposal area (Draper 1985). About 52 samples were collected from the disposal area in 1984 and analyzed in the Mound soils screening facility. Results indicate total thorium levels around 1 pCi/g; the highest was 1.2 pCi/g (MRC 1984). The data sheets are included in Appendix E.

5.11. RAILROAD SIDING

The railroad siding or spur that enters Mound Plant from the west has been used extensively for shipping and receiving radioactive materials and radioactively contaminated wastes. Through the 1950s and 1960s, the siding was used for unloading lead casks containing the bismuth/polonium mixtures used in the polonium processing. In the mid-1950s, the siding was the site of the unloading of thorium drums, as well as the decontamination of the boxcars in which the drums were shipped. The siding historically extended about 500 feet east of their current location. The eastern portions were removed or simply buried at an unknown date. The portion that would underlie the waste transfer line, known as Area 19 (Plate 1), is gone and may have been removed when the line was built in 1967 (DOE 1992g). Portions of the siding east of Area 19 (Plate 1) are known to be in place, but covered by a thin layer of soil.

The siding itself was not a sampling target during the Site Survey Project (Stought et al. 1988); however, some limited sampling has been performed. Site Survey Project samples S0485 and S0491 (Appendix E) located near the siding (Plate 1) indicated levels of plutonium-238 below 5 pCi/g and less than 2 pCi/g of thorium. Subsequent sampling along the siding indicates that elevated thorium contamination may be very localized. Two samples collected in 1987 and analyzed by the Mound Plant

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 under gone 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. Sample were apparently collected north and west of the fenceline 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).

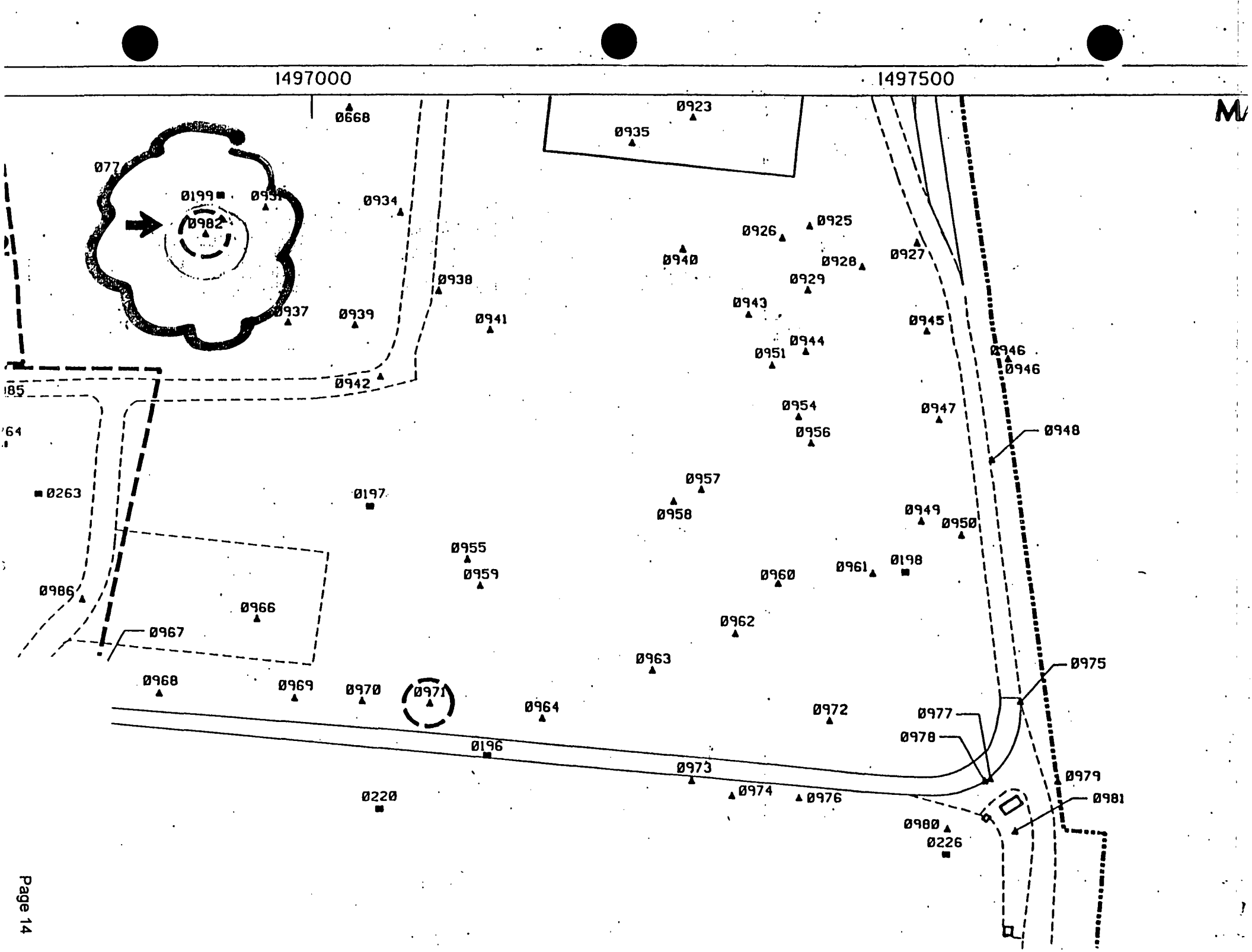
Mound Plant drawings #FSE16472 (DOE 1992f) indicates the depth to bedrock in this area of Mound Plant is approximately 180 inches, or about 15 ft. The core locations in this area were sampled to at least 216 inches. Based on the Mound Plant drawing referenced above, it appears that the core locations 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. (page 2 of 2)

Plate 1 Location[a]	Coordinates South	Coordinates West	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)
S0647[d]	3340	2610	2778	10-83	0	NR	NR		LDL	270	LDL	LDL
S0706	3325	4035	4021	07-84	0	28.90	b					
S0971	4075	3025	5958	07-84	0	0.15	5.02					
S0982	3625	3025	5944	07-84	0	0.43	14.94					
S1092	2185	3362	8413	12-84	e	0.31	323.5[f]					

[a]Map locations are given using a "C" to designate core locations and an "S" to designate surface locations.
[b]A "b" indicates that the total thorium concentration was less than the background level of 2 pCi/g, using FIDLER screening. Therefore, radiochemical analysis was not performed.
[c]The boring log for this location indicates that sampling was not performed to bedrock (Appendix B).
[d]Contaminated soil was excavated from this location in 1984. Post-cleanup soil concentrations of cesium-137 were less than 2 pCi/g (Draper 1984).
[e]The depth given for this sample was "SS." For mapping purposes (Plate 1), this is assumed to be a surface sample.
[f]Isotopic results are available for this sample and include 0.99 pCi/g of thorium-228; 321 pCi/g of thorium-230, and 1.5 pCi/g of thorium-232, for a total of 323.5 pCi/g of thorium.
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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S.S. SAMPLES RAN AT 400 SECONDS (WET) Radar's Hill 7-18-84

SAMPLE #	GROSS CNTS.	Pu	Rci/g Pu	GROSS CNT/H	Rci/g Th	LOCATION			
5634	348	-1.6		449	.3	FLAG 335	SAMPLE	#1	1'-2.5'
5635	399	8.4		406	.2			#2	5'
5636	430	8.6		583	.6			#3	7½'
5637	409	7.5		498	.4			#4	10'
5638	544	34.4		369	.1	FLAG 335	SAMPLE	#5	12½'
5639	529	23.1		603	.6	FLAG 336	SAMPLE	#1	1'-2.5'
5640	442	7.2		709	.8			#2	3.5'-5'
5641	445	14.4		472	.4			#3	6'-7.5'
5642	363	2.5		396	.2			#4	8.5'-10'
5643	425	12.5		418	.2	FLAG 336	SAMPLE	#5	11'-12'
5644	441	6.7		717	.9	FLAG 337	SAMPLE	#1	1'-2.5'
5645	483	14.7		688	.8			#2	2'-5'
5646	458	11.9		636	.7	FLAG 337	SAMPLE	#3	6.5'
5647	433	12.7		459	.3	FLAG 338	SAMPLE	#1	1'-2.5'
5648	420	5.3		640	.7			#2	5'
5649	440	10.3		585	.6			#3	7.5'
5650	344	-4.0		506	.4	FLAG 338	SAMPLE	#4	10'
5651	398	5.6		497	.4	FLAG 339	SAMPLE	#1	2.5'
5652	410	1.9		696	.8			#2	5'
5653	435	9.1		596	.6			#3	7.5'
5654	421	6.4		606	.6	FLAG 339	SAMPLE	#4	9.5'
5655	507	19.1		681	.8	FLAG 340	SAMPLE	#1	2.5'
5656	417	1.2		765	.9			#2	5'
5657	423	11.1		457	.3	FLAG 340	SAMPLE	#3	6.5'
5658	377	-0.4		578	.6	FLAG 341	SAMPLE	#1	2.5'
5659	436	9.0		605	.6			#2	5'
5660	456	4.8		871	1.2			#3	7.5'
5661	399	7.9		423	.3	FLAG 341	SAMPLE	#4	10'
5662	514	14.3		890	1.2	FLAG 342	SAMPLE	#1	2.5'
5663	433	11.5		502	.4			#2	5'
5664	387	-2.0		695	.8			#3	7'
5665	377	2.1		494	.4	FLAG 342	SAMPLE	#4	9.5'
5666	460	9.0		750	.9	FLAG 343	SAMPLE	#1	2.5'
5667	522	20.4		725	.9			#2	5'
5668	351	-0.8		441	.3	FLAG 343	SAMPLE	#3	7'
5669	439	9.2		617	.6	FLAG 344	SAMPLE	#1	2.5'
70	417	8.8		500	.4				

S.S SAMPLES RAN @ 400 SECONDS (WET) 7-18-89

SAMPLE #	Pu GROSS CNTS	Pu Pci/g	Th GROSS CNTS.	Th Pci/g	LOCATION			
5671	401	5.1	533	.5	FLAG 344	SAMPLE	#3	7.5'
5672	377	4.6	407	.2	FLAG 344	SAMPLE	#4	9.5'
5673	424	14.2	354	1	FLAG 346	SAMPLE	#1	2.5'
5674	476	7.9	884	1.2			#2	5'
5675	345	1.2	331	.1	FLAG 346	SAMPLE	#3	7'
5676	428	1.5	818	1.1	FLAG 347	SAMPLE	#1	2.5'
5677	468	10.8	736	.9			#2	5'
5678	425	5.2	671	.8	FLAG 347	SAMPLE	#3	6.5'
5679	486	14.7	708	.8	FLAG 348	SAMPLE	#1	5'
5680	421	8.7	528	.5			#2	7.5'
5681	404	6.4	501	.4	FLAG 348	SAMPLE	#3	7.5'
5682	428	7.5	609	.6	FLAG 349	SAMPLE	#1	2.5'
5683	237	-17.9	398	.1			#2	5'
5684	370	5.0	350	.1			#3	7.5'
5685	381	3.0	486	.4	FLAG 349	SAMPLE	#4	10'

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

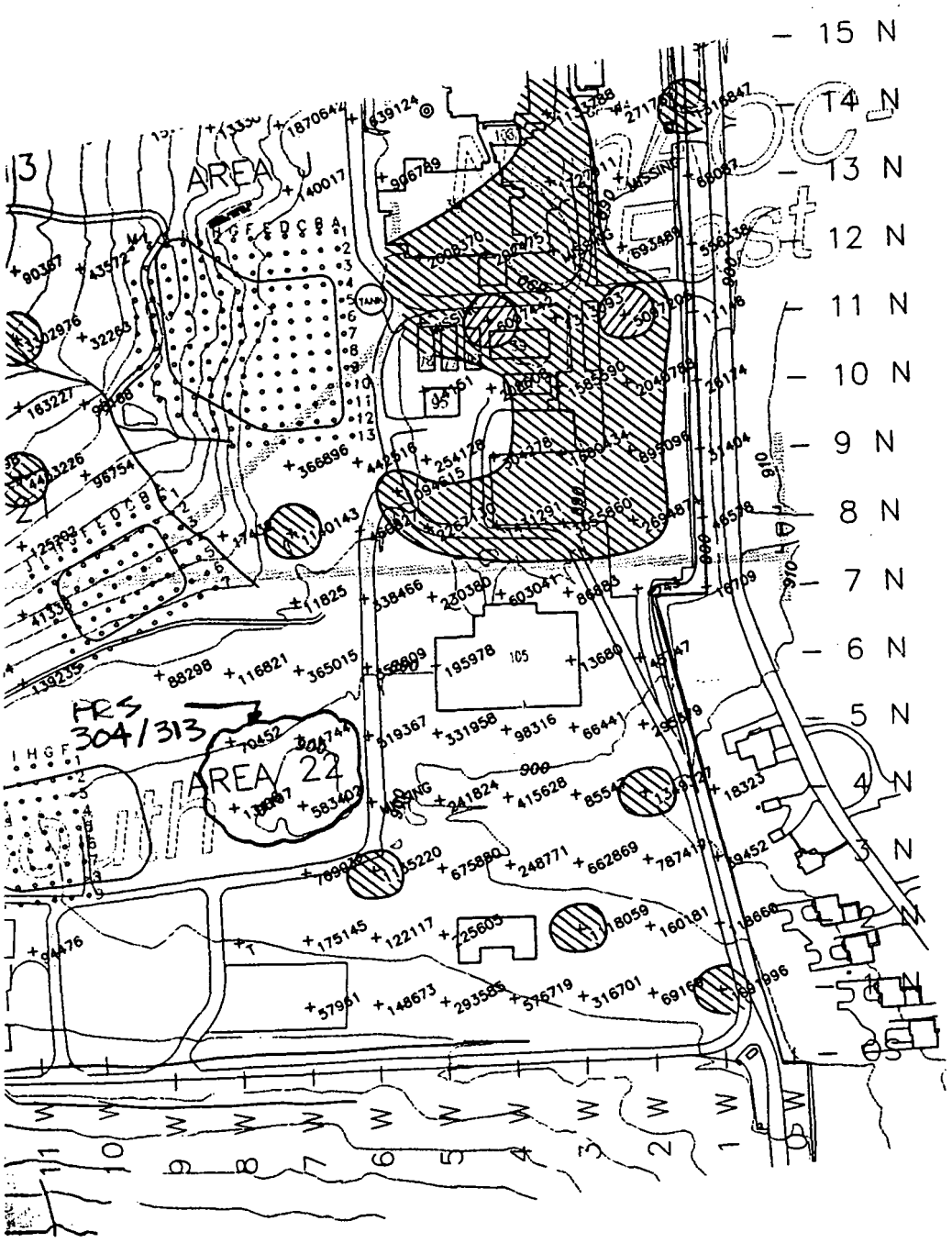
VOLUME II - APPENDICES A-G

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies



Features:

+ PETREX Sample Location

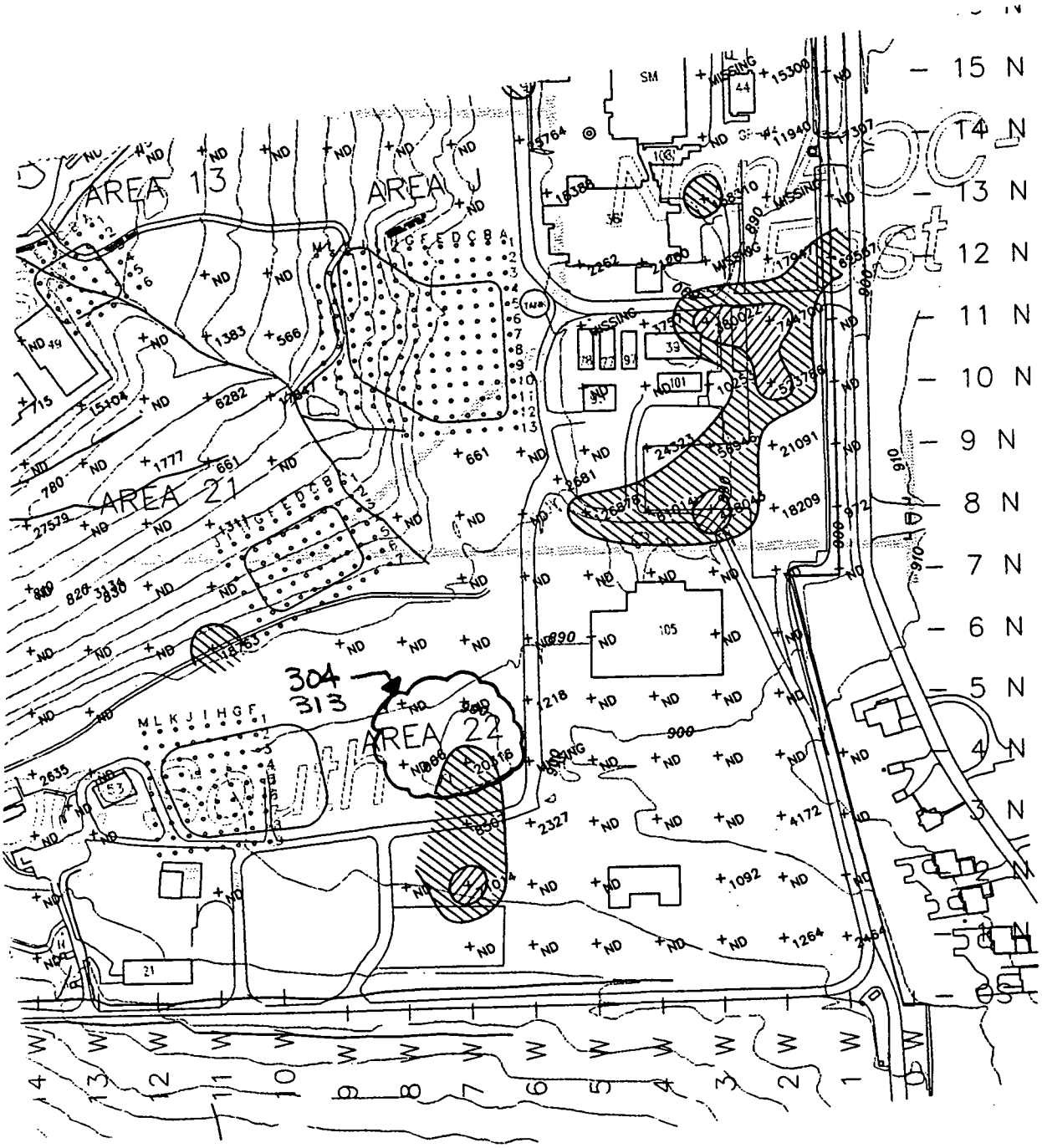
ND Not Detected

T Denotes interference by terpenes; see text.

Relative Response

Total Aromatic Hydrocarbons

Plate 2



Features:

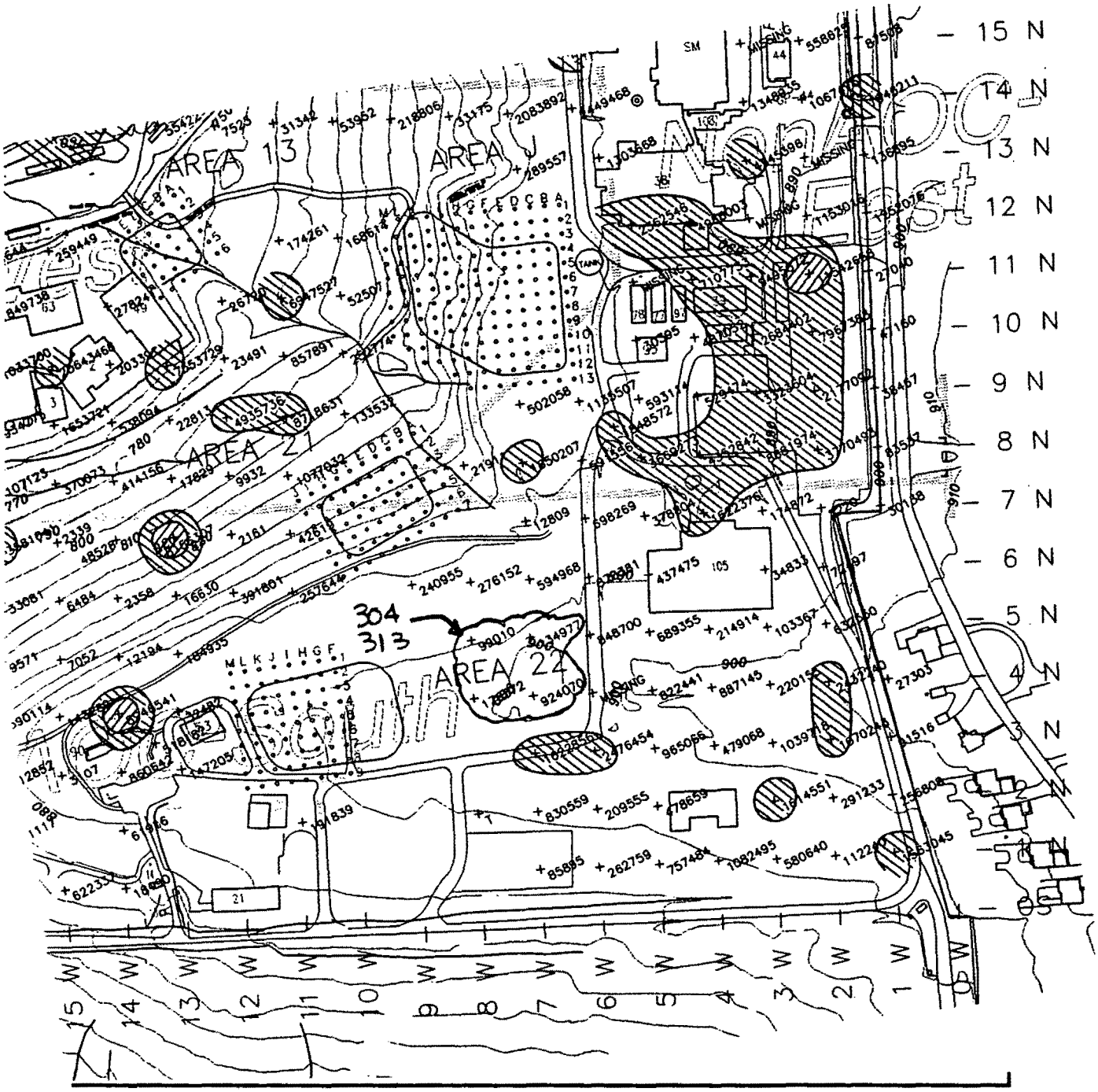
+ PETREX Sample Location

ND Not Detected

Relative Response

Total Semivolatile Hydrocarbons

Plate 3



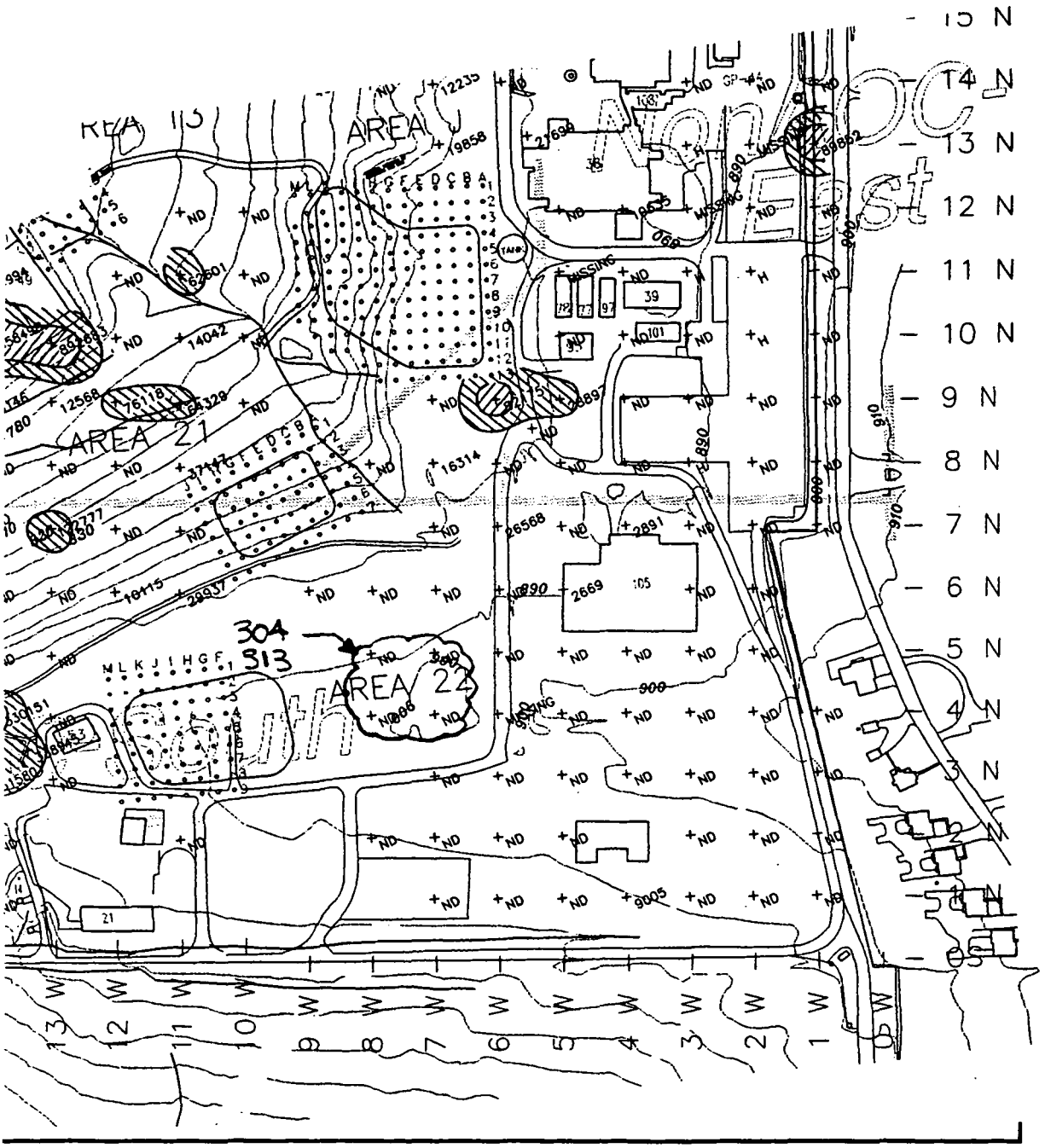
Features:

+ PETREX Sample Location
T Denotes interference by terpenes; see text.

Relative Response

Total C5–C11 Petroleum Hydrocarbons

Plate 4



Features:

+ PETREX Sample Location

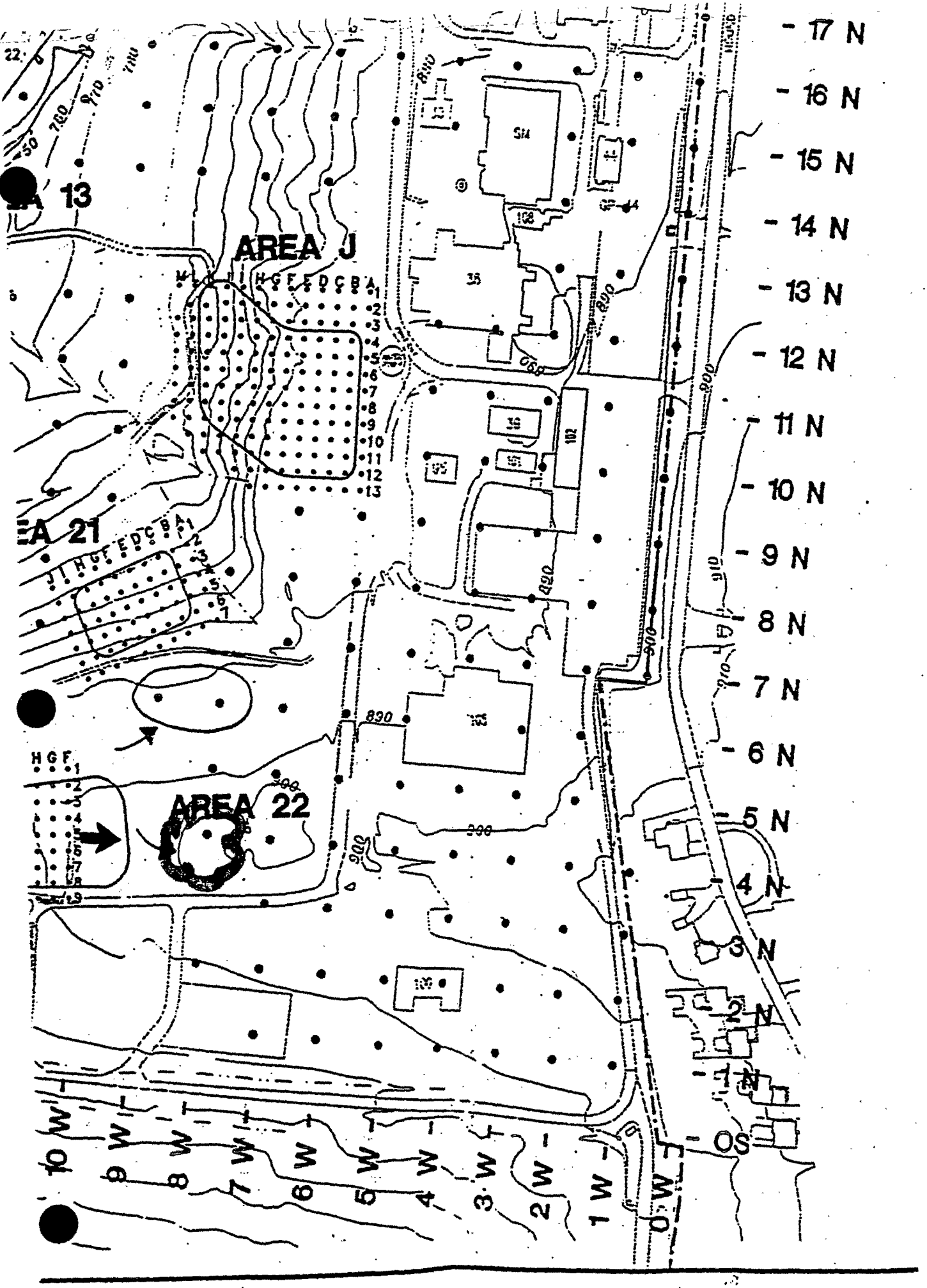
ND Not Detected

H Denotes interference by petroleum hydrocarbons; see text.

Relative Response

Total Halogenated Hydrocarbons

Plate 5



ABLE UNIT 5 PHASE 1 RI/FS OPERATIONAL AREA

APPENDIX D

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

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
04N06	137.8	100	6.5	5.0	NC	0	a	0.3	a
04N6.5	137.8	1000	6.5	80	45	NC		NC	
04N07	137.8	100	6.5	6.0	NC	19	a	0.8	a
04N08	179.4	100	10.92	8.5	NC	0	a	1.1	a
04N13	170.3	130	9.72	8.5	NC	15	a	0.7	a
04N14	170.3	110	9.72	6.0	NC	16	a	1.4	a
04N15	179.4	170	10.92	8.5	NC	19	a	1.2	a
04N16	179.4	140	10.92	8.0	NC	31	b	0.8	a
04N17	179.4	170	10.92	8.0	NC	15	a	1	a
04N18	179.4	160	10.92	8.5	NC	37	b	1	a
04N19	179.4	150	10.92	9.5	NC	35	b	1.5	a
04N20	130	75	6.5	5.5	NC	21	a	1.1	a
04N21	130	50	6.5	4.5	NC	11	a	0.1	a
04N22	157.3	120	8.45	8.0	NC	0	a	0.9	a
04N23	139	100	9.23	6.5	NC	16	a	0.6	a
05N02	253.5	115	12.48	9.0	NC	30	b	1.2	a
05N03	253.5	95	12.48	5.5	NC	16	a	1.3	a
05N04	253.5	115	12.48	7.5	NC	27	b	1.1	a
05N05	253.5	105	12.48	7.0	NC	1	a	0.8	a
05N06	184.6	70	11.7	4.0	NC	0	a	0.3	a
05N07	184.6	160	11.7	6.5	NC	0	a	0.8	a
05N08	184.6	125	11.7	8.5	NC	18	a	1.2	a
05N13	179.4	145	10.92	9.5	NC	16	a	1.2	a
05N14	179.4	120	10.92	7.0	NC	25	b	0.2	a
05N15	179.4	140	10.92	9.5	NC	41	b	0.5	a
05N16	210.6	140	12.22	11.0	NC	16	a	1.1	a
05N17	210.6	145	12.22	9.0	NC	18	a	1	a
05N18	210.6	165	12.22	10.5	NC	39	b	0.8	a
05N19	130	105	6.5	9.5	NC	7	a	0.9	a

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Environmental Restoration Program

OTHER SOILS CHARACTERIZATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

Volume I – Text

May 1996

Final
(Revision 0)

U.S. Department of Energy
Ohio Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

5.0 Results

Samples collected as part of the Other Soils characterization effort underwent analyses under two distinct programs, the Field and Laboratory Programs. Figure 5.1 shows the program measurements for the two programs.

Field Program

Samples were subject to field analyses for elevated activity (alpha, beta, and gamma) and the presence of organic compounds. As part of the field effort, the PXRF was used to analyze for inorganic metals, and the Mound Radiological Laboratory provided analyses (initially) for Pu238 and Th232. Later, the Mound Radiological Laboratory expanded its scan to include a number of additional radionuclides.

Field and Mound Rad lab data were reviewed against specific action levels of the D&D program, and in accordance with the SAP. Data exceeding action levels were tabulated, and are presented by area in this section. Raw field data has been retained in Appendix E.

Lab Program

Based on initial field results, and consultation with Mound Project Engineers, specific locations were targeted for resampling. Collocated samples were shipped offsite to independent laboratories to analyze for specific radionuclides, organic compounds, and metals.

Analytical results of the two programs were compared to help quantify data collected as part of the field program.

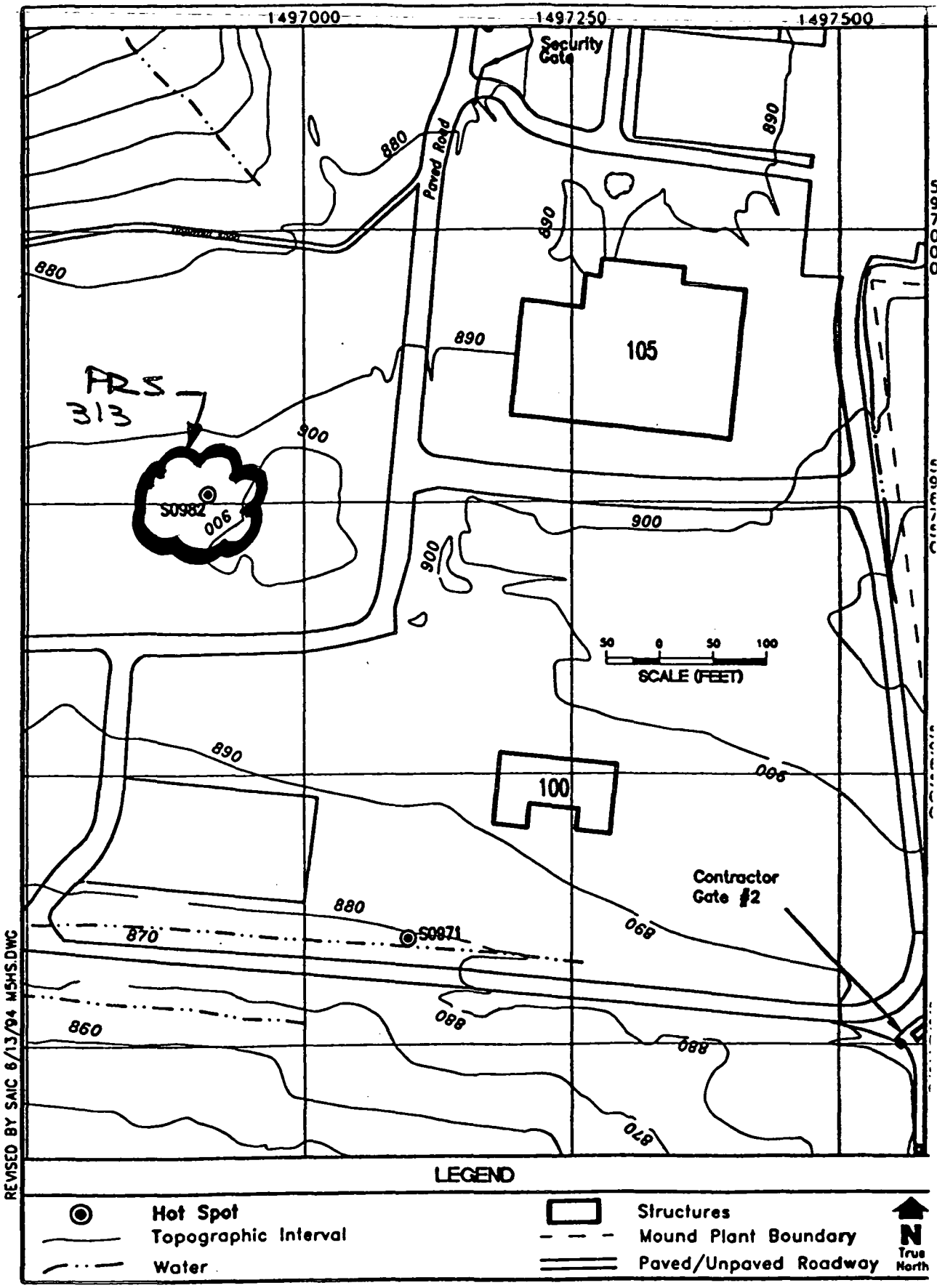

Figure 2.8. Location of Hot Spots S0971 and S0982

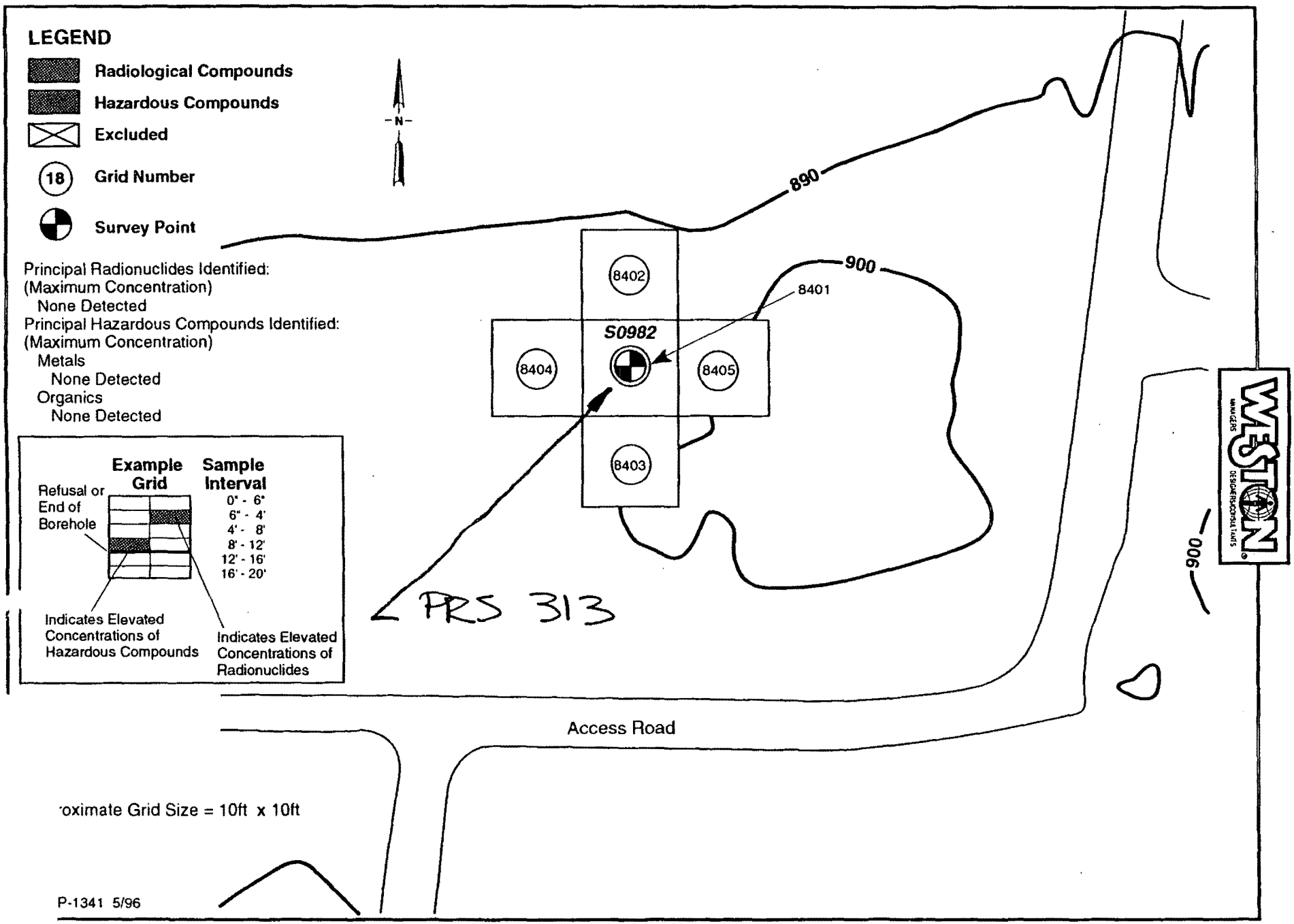

FIGURE 5.15 HOT SPOT S0982

Hot spots with a data overlay have been included to facilitate interpretation, and aid in the computation of soil cleanup volumes.

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

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

Table 5.2 Field Action Levels

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

* NRC Limit

PR 3/3

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

S0982

Analyses of soil samples revealed no radiological, organic or inorganic compounds in concentrations exceeding the action levels defined in Section 5.1. Figure 5.15 graphically represents Hot Spot S0982 field sampling results.

Document Control No. _____

Environmental Restoration Program

OTHER SOILS CHARACTERIZATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

Volume II – Appendices

May 1996

Final
(Revision 0)

U.S. Department of Energy
Ohio Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

WESTON

SHEET ____ of ____

CLIENT/SUBJECT S0982 84XX 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	β	Organics		Metals
	(27) Plutonium	(51) Thorium	(1K) Channel 1	(5K) Channel 2			OVA	OVM	
8401-5001	—	—	—	—	—	—		—	
-5004	—	—	—	—	—	—		—	
8402-5001	—	—	—	—	—	—	—	—	
-5004	—	—	—	—	—	—	—	—	
8403-5001	—	—	—	—	—	—	—	—	
-5004	—	—	—	—	—	—	—	—	
8404-5001	—	—	—	—	—	—	—	—	
-5004	—	—	—	—	—	—	—	—	
8405-5001	—	—	—	—	—	—	—	—	
-5004	—	—	—	—	—	—	—	—	

DATE	FILE	ID	"TIME"	"CrHI"	"K"	"Ca"	"Ti"	"CrLO"	"Mn"	"Fe"	"Co"	"Ni"	"Cu"	"Zn"	"As"	"Se"
21-Aug-95	A082195B	7509-6017	16.813	-360.76	28166	66440	2819.9	89.908	650.38	24393	196.76	4.6675	-18.314	49.777	18.289	-0.03497
27-Jul-95	A072795A	8001-5001	13.048	-752.65	3612.8	239163	484.09	-125.73	-81.682	6783.3	-28.108	-0.29142	41.645	8.6526	43.93	16.751
27-Jul-95	A072795A	8002-5001	13.279	-814.78	2821.4	240077	562.14	-122.84	499.13	9799.5	41.673	23.351	50.502	97.535	14.425	36.426
27-Jul-95	A072795A	8003-5001	13.566	-680.85	3021.6	217459	378.2	-124.47	316.5	6791.2	54.095	-6.5998	30.267	35.447	14.564	25.232
27-Jul-95	A072795A	8004-5001	13.949	-832.78	3207.3	233723	474.14	-165.14	135.5	7209.9	-157.94	34.288	57.321	-4.1015	17.988	10.338
27-Jul-95	A072795A	8005-5001	14.231	-669.8	3434.4	216227	846.62	-123.82	165.48	11062	79.5	-10.237	92.262	161.41	9.0517	16.953
27-Jul-95	A072795A	8005-6001	14.465	-484.6	3005.4	215162	840.03	-205.56	552.22	11902	44.774	-41.742	79.02	111.3	-7.1289	18.565
5-Apr-95	A040595A	8101-5001	15.475	-121.78	13327	71145	1355.6	178.18	104.58	17285	-237.16	-32.095	24.337	76.417	48.025	-35.259
5-Apr-95	A040595A	8101-5004	16.083	-120.43	26805	90596	2526.3	85.377	273.37	22434	-125.59	35.244	-46.942	17.041	30.836	-40.244
5-Apr-95	A040595A	8101-5008	16.318	73.752	33032	99630	2856.5	-67.12	16.873	27704	-254.09	18.813	-27.935	23.386	26.751	-41.534
5-Apr-95	A040595B	8101-5012	17.05	730.8	18477	182197	1973	135.53	0	17065	0	0	0	52.35	0	0
5-Apr-95	A040595B	8101-5012	17.283	86.716	18766	182439	2060.1	99.297	214.45	18865	-361.87	11.022	-17.29	4.1906	14.916	-28.916
6-Apr-95	A040695A	8101-5016	8.886	-129.25	29574	119404	2885.4	-14.114	25.085	24373	-254.56	8.3728	18.841	68.382	28.158	-24.087
5-Apr-95	A040595B	8101-6012	17.51	121.75	20572	165731	2011.9	76.179	17.465	18657	-99.67	5.4681	25.614	23.296	12.406	-46.752
29-Mar-95	81025001	8102-5001	10.77	-740.15	13924	74662	2117	-0.38568	554.96	18525	-47.373	-19.926	5.3061	719.35	6.4901	-15.065
29-Mar-95	81025004	8102-5004	10.509	-807.94	30176	103032	3111.8	-111.06	647.25	27286	-84.816	-24.256	52.128	121.78	-1.9319	-17.855
29-Mar-95	81025008	8102-5008	10.282	-635.51	34826	95827	3520.1	-104.44	454.97	28083	-252.4	85.09	49.456	96.373	4.3029	-21.1
29-Mar-95	81025012	8102-5012	10.01	-870.59	22673	161826	2523.9	-124.17	504.92	23739	-174.84	76.338	43.951	73.414	-7.3438	-15.646
29-Mar-95	81026001	8102-6001	11.087	-597.7	13550	71799	1930.3	29.259	280.78	18028	-212.14	-47.581	64.071	773.8	-7.9482	-4.1828
24-Mar-95	81035001	8103-5001	12.702	-467.07	16843	62850	1824.5	-14.976	456.17	18580	-78.785	12.965	67.579	157.75	-1.15	-9.1047
24-Mar-95	81035004	8103-5004	12.96	-770.17	33723	93378	3535.7	-30.376	876.07	28041	129.06	-21.529	75.378	88.423	-7.4534	-30.947
24-Mar-95	81035008	8103-5008	13.197	-496.66	32970	106327	3208.7	-106.39	348.91	27740	22.513	76.687	45.49	84.255	1.6091	-3.7808
24-Mar-95	81035012	8103-5012	13.497	-382.09	38016	100989	3957.4	-46.659	435.71	31310	195.21	25.898	79.18	51.705	-33.38	-8.9191
24-Mar-95	81035016	8103-5016	13.767	-661.47	33683	106370	3386	-71.252	510.32	26620	-82.267	28.661	74.464	115.4	13.212	-8.4544
24-Mar-95	81045001	8104-5001	12.413	-652.02	15088	58459	2026.3	-33.269	670.69	19216	-23.66	33.126	58.978	141.51	14.997	-5.6564
23-Mar-95	81045004	8104-5004	15.566	-466.69	27638	108353	2715	-77.774	274.36	25504	-96.936	16.124	13.361	84.881	-9.5305	4.8881
23-Mar-95	81045008	8104-5008	15.328	-558.29	27083	127977	2490.1	-95.38	540.61	23395	69.155	8.9215	35.034	99.435	-12.098	-15.182
23-Mar-95	81045012	8104-5012	15.076	-719.95	13695	222541	1503.6	-178.91	346.53	15640	69.203	29.599	24.791	71.162	24.345	-11.975
23-Mar-95	81046004	8104-6004	15.807	-557.09	28439	104980	2641.2	26.686	657.86	26219	104.73	-89.77	-1.9848	46.331	8.7635	-27.336
13-Mar-95	81055001	8105-5001	14.792	-260.19	15053	46843	2180.7	14.595	182.43	20859	-147.06	-0.26957	-18.714	320.66	47.653	2.1262
13-Mar-95	81055004	8105-5004	16.429	-576.28	8488.9	124085	1119.9	78.473	-227.42	11762	-49.037	-46.112	2.5309	84.452	44.628	-0.79656
13-Mar-95	81055008	8105-5008	14.545	-36.667	15964	129109	1740.8	-34.005	105.2	15206	63.029	-93.811	-14.695	96.812	37.86	12.76
13-Mar-95	81055012	8105-5012	16.213	-273.41	33120	121095	3236.4	-80.233	167.28	24616	138.42	-62.609	-11.777	73.962	49.116	7.4301
6-Apr-95	A040695A	8301-5001	9.238	-56.882	23933	67606	2690.3	19.286	524.67	26557	-212.53	45.244	-3.1291	67.791	41.83	-18.474
6-Apr-95	A040695A	8301-5004	9.471	-359.38	18259	152963	1979.9	40.576	-24.624	21739	-120.05	50.83	1.3992	39.291	18.643	-40.336
5-Apr-95	A040595A	8302-5001	14.146	-21.67	28823	58956	2828.9	-0.08359	482.61	29685	-169.23	-18.285	27.231	85.158	17.084	-31.804
5-Apr-95	A040595A	8302-5004	14.376	-229.71	20843	63925	2613.8	107.03	925.26	23219	-20.539	63.044	-5.1819	84.239	16.187	-32.662
6-Apr-95	A040695A	8303-5001	9.694	-243.35	23439	78227	2870.2	43.783	518.57	26618	-163.24	2.1177	8.274	63.065	35.236	-38.551
5-Apr-95	A040595A	8303-5004	14.704	180.72	22486	142797	2406.3	32.337	-151.18	22998	-76.174	-18.268	77.156	25.324	-8.1202	-24.842
5-Apr-95	A040595A	8304-5001	14.934	-14.856	15698	51777	2659.2	75.742	552.81	17488	-52.354	-48.763	43.121	43.672	16.716	-30.223
5-Apr-95	A040595A	8304-5004	15.214	-138.39	17735	126849	1821.9	162.69	358.06	20584	-150.68	71.452	-16.001	20.899	40.297	-24.047
6-Apr-95	A040695A	8305-5001	9.924	-121.68	19038	29824	2698.1	95.019	634	28680	-49.005	-42.045	13.547	56.815	11.757	-28.134
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
5-Apr-95	A040595A	8401-5001	13.208	26.596	16977	27064	2990.2	47.757	526.93	21405	-71.548	2.0537	6.0756	22.827	27.996	-28.035
5-Apr-95	A040595A	8401-5004	13.432	-181.56	14689	176307	1869.2	11.881	338.81	17821	-105.42	-29.971	-35.972	48.253	26.002	-38.765
5-Apr-95	A040595A	8401-6004	13.68	-317.35	12908	173650	1695.3	125.88	220.94	16523	-253.24	47.115	9.0811	40.831	45.812	-30.834
6-Apr-95	A040695A	8402-5001	10.426	-262.24	17108	17827	2892.6	34.536	677.34	20241	-0.69549	-42.077	12.334	45.529	-4.5052	-28.852
30-Mar-95	84025004	8402-5004	9.098	-522.72	13855	101196	2197	-129.64	769.23	18356	-123.57	-17.274	37.818	37.621	5.9983	-5.6632
6-Apr-95	A040695A	8403-5001	10.664	-188.59	16238	31853	2827.7	68.125	332.51	18950	-194.25	-63.42	-16.222	12.007	20.171	-37.078
30-Mar-95	84035004	8403-5004	9.363	-604.45	12169	174597	1336.9	-136	224.57	14664	-134.86	17.476	48.718	71.964	-2.7337	-10.915
6-Apr-95	A040695A	8404-5001	10.886	-225.25	15599	18700	2554.2	69.802	364.88	20007	29.035	-30.493	-27.177	53.247	25.709	-23.306
6-Apr-95	A040695A	8404-5004	11.142	-107.97	13221	146126	1901.3	88.277	386.93	18818	16.875	-5.2231	-14.276	21.89	12.331	-38.736
6-Apr-95	A040695A	8404-6004	11.402	-229.96	14678	155225	2050.2	-20.697	531.9	20829	-41.119	-9.8775	-13.443	64.801	14.692	-44.393
30-Mar-95	84055001	8405-5001	8.874	-476.54	18753	22355	3471	0.52046	743.92	21512	-186.81	-10.393	78.415	57.195	10.071	2.1635
30-Mar-95	84055004	8405-5004	9.619	-570.63	13677	102954	1996	6.2115	471.4	18229	-169.71	60.364	42.358	89.33	23.276	-9.6653
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
31-Aug-95	A[redacted]	8501-5004	14.286	-895.65	4800.6	241339	414.15	-46.661	-33.473	9482.9	-89.09	151.5	-48.576	7.3346	70.43	-6.7607
31-Aug-95	[redacted]	8501-5007	14.506	-775.34	16235	129652	1567.8	83.833	358.29	17954	[redacted]	[redacted]	[redacted]	[redacted]	70.842	-8.4164
30-Aug-[redacted]	A08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	72.601	-8.6042
30-Aug-95	A08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	56.116	-21.719
30-Aug-95	A08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	59.298	-11.981
[redacted]-Aug-95	A08	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	55.692	-9.8496
[redacted]-Aug-95	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	53.191	-30.619
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	59.545	-33.16
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	48.188	-16.314
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	59.639	-8.8428
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	75.199	-17.505
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	50.558	-13.083
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	57.143	-27.637
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	59.803	-5.4339
30-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	11.089	-17.053
28-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	46.903	-32.111
28-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	57.541	-31.258
28-Aug-95	A0	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	57.831	-39.316
24-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.123	-2.7678
29-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	.1419	3.3306
30-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	3.371	-11.453
29-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	.3773	-17.23
24-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	.2917	-15.24
24-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	8.8614	-5.1928
24-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	11.964	-8.9381
24-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	63634	-11.084
24-Mar-95	87	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	3.3759	-12.886
24-Mar-95	8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	1.3156	-18.606
24-Mar-95	8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	21.728	-13.3
24-Mar-95	8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	10.86	-24.092
24-Mar-95	8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	13.357	-19.621
24-Mar-95	8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	16.885	-0.20627
28-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	81.713	-29.593
28-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	65.859	-26.458
28-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	106.23	-34.694
28-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	64.735	-28.088
28-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	60.503	-39.197
28-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	64.324	-47.622
29-Aug-95	A	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

PRS 313

Key to interpreting sample data:

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

Where:

XX = Area designation

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

ZZ = Sample Type
- 50 = Soil

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

SODIUM IODIDE SOIL SCREEN
400 SECOND COUNT

Prepared by _____

SAMPLE NO.	DATE COLLECTED	DATE SCREENED	SAMPLER	SAMP TYPE	88 KEV WINDOW	17 KEV WINDOW	MORE ISO-TOPES	GRID LOCATION	WELL
9501960	03/08/95	03/09/95	J. TACKETT [redacted]	CONT	1.6	1	N	WESTON HS S0982 8401-5001 0-6"	A
9501961	03/08/95	03/09/95	J. TACKETT [redacted]	CONT	1.1	16	N	WESTON HS S0982 8401-5004 6"-4'	C
9502018	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.4	12	N	WESTON HS S0982 OTHER SOILS 8402-5001	C
9502022	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.2	20	N	WESTON HS S0982 OTHER SOILS 8402-5004	C
9502015	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.0	16	N	WESTON HS S0982 OTHER SOILS 8403-5004	C
9502019	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.5	22	N	WESTON HS S0982 OTHER SOILS 8403-5001	C
9502016	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.5	4	N	WESTON HS S0982 OTHER SOILS 8404-5001	A
9502017	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.3	5	N	WESTON HS S0982 OTHER SOILS 8404-5004	A
9502020	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.0	11	N	WESTON HS S0982 OTHER SOILS 8405-5001	A
9502021	03/13/95	03/13/95	J. TACKETT [redacted]	CONT	1.0	13	N	WESTON HS S0982 OTHER SOILS 8405-5004	A

- TEST CRITERIA -

1.) ACTIVITY IN THE 88 KEV WINDOW CALIBRATED FOR TH-232.

2.) ACTIVITY IN THE 17 KEV WINDOW CALIBRATED FOR PU-238.

3.) INDICATION OF OTHER ISOTOPES (Y) MEANS THAT ISOTOPES OTHER THAN TH-232 AND PU-238 MAY BE PRESENT.

SEE GAMMA SPECTROSCOPY REPORT.

- METHOD STATISTICS -

	PU - 238		TH - 232	
WELL	MDA (pCi/g)	UNCERTAINTY (+/-) (95 % CONFIDENCE) (pCi/g)	MDA (pCi/g)	UNCERTAINTY (+/-) (95 % CONFIDENCE) (pCi/g)
A	31	13	2.1	0.9
B	31	13	2.1	0.9
C	25	11	2.6	1.1

MOUND

Environmental
Restoration
Program

Further Assessment

Soil Gas Confirmation Sampling

Mound Plant
Miamisburg, Ohio

May 1996

Revision 0

Department of Energy

EG&G Mound Applied Technologies

Table I.1 Soil Analyte List

Volatile Organic Compounds

Acetone
Benzene
Bromodichloromethane
Bromoform
Bromomethane
2-Butanone
Carbon Disulfide
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
Dibromochloromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloroethene (total)
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Ethylbenzene
2-Hexanone
Methylene Chloride
4-Methyl-2-Pentanone
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane-
Trichloroethene
Toluene
Vinyl Acetate
Vinyl Chloride
Xylenes (total)

Semivolatile Organic Compounds

Acenaphthene
Acenaphthylene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
bis(2-Chloroethoxy)methane
bis(2-Chloroethyl)ether
bis(2-Ethylhexyl)phthalate
4-Bromophenyl-phenylether
Butylbenzylphthalate
Carbazole
4-Chloroaniline
4-Chloro-3-methylphenol
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl-phenylether
Pentachlorophenol
Phenanthrene
Phenol
Chrysene
Dibenz(a,h)anthracene
Dibenzofuran
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3-Dichlorobenzidine
2,4-Dichlorophenol
Diethylphthalate
2,4-Dimethylphenol
Dimethyphthalate
Di-n-butylphthalate
Di-n-octylphthalate
4,6-Dinitro-2-methylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Fluoranthene
Fluorene
Pyrene
1,2,4-Trichlorobenzene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno(1,2,3-cd)pyrene
Isophorone
2-Methylnaphthalene
2-Methylphenol
4-Methylphenol
Naphthalene
2-Nitroaniline
3-Nitroaniline
4-Nitroaniline
Nitrobenzene
2-Nitrophenol
4-Nitrophenol
N-Nitroso-di-n-propylamine
N-Nitroso-diphenylamine
2,2-oxybis(1-Chloropropane)
2,4,5-Trichlorobenzene
2,4,6-Trichlorobenzene

Table I.1 Soil Analyte List (Continued)

Pesticides/PCB's		
Aroclor-1016	Delta-BHC	Endosulfan II
Aroclor-1221	Gamma-BHC	Endosulfan sulfate
Aroclor-1232	alpha-Chlordane	Endrin
Aroclor-1242	gamma-Chlordane	Endrin aldehyde
Aroclor-1248	4,4'-DDD	Endrin ketone
Aroclor-1254	4,4'-DDE	Heptachlor
Aroclor-1260	4,4'-DDT	Heptachlor epoxide
Aldrin	Dieldrin	Methoxychlor
Alpha-BHC	Endosulfan I	Toxaphene
Beta-BHC		
Inorganics		
Aluminum	Copper	Potassium
Antimony	Cyanide	Selenium
Arsenic	Iron	Silver
Barium	Lead	Sodium
Beryllium	Lithium	Thallium
Bismuth	Magnesium	Tin
Cadmium	Manganese	Vanadium
Calcium	Mercury	Zinc
Chromium	Molybdenum	Nitrate/Nitrite
Cobalt	Nickel	Explosives (USATHAMA,PETN)
Radionuclides		
Americium-241	Plutonium-238	Thorium-230
Bismuth-207	Plutonium-239/240	Thorium-232
Bismuth-210	Potassium-40	Uranium-234
Cesium-137	Radium-226	Uranium-235
Cobalt-60	Thorium-228	Uranium-238

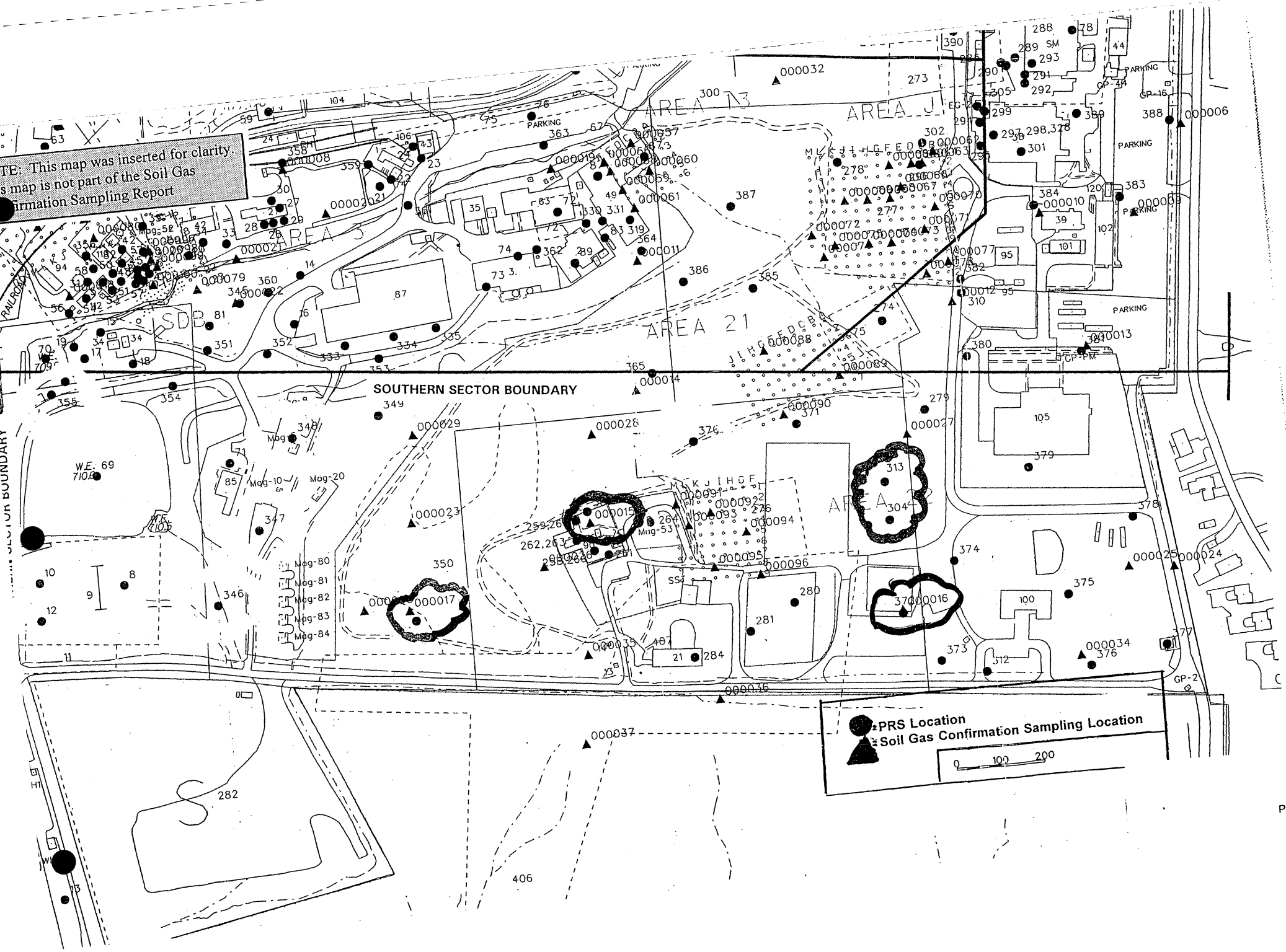
TE: This map was inserted for clarity.
s map is not part of the Soil Gas
irmation Sampling Report
SOUTHERN SECTOR BOUNDARY
AREA 3
AREA 13
AREA J
AREA 21
AREA 2
PARKING
PRS Location
Soil Gas Confirmation Sampling Location
0 100 200

Table A.1. Soil Gas Confirmation Detected Volatile Organic Compounds (cont.)

ANALYTE	SGC NAC 00001	SGC NAC 000011	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	Background	10^{-6} Construction Worker Guidelines
VOLATILES (µg/Kg)								
Acetone							NA	105000000
1,2-Dichloroethene (total)						96	NA	21500000
2-Butanone			8 J	10			NA	46500000
Benzene						2 J	NA	8900
Carbon Disulfide				J			NA	1400000
Chloroform							NA	NA
Chloromethane	4						NA	NA
Ethylbenzene						1 J	NA	480
Methylene Chloride	8						NA	NA
Tetrachloroethene							NA	10500000
Toluene		2 J				28	NA	1250000
Trichloroethene				7		3 J	NA	41000
Xylene (total)					1 J	4 J	NA	2150000000

No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.1. Soil Gas Confirmation Detected Volatile Organic Compounds (cont.)

ANALYTE	SGC NAC 000016	SGC NAC 000017	SGC SAN 0000[illegible]	SGC NAC 00[illegible]019	SGC NAC 000020	SGC NAC 00[illegible]22	Background	10^{-6} Construction Worker Guidelines
VOLATILES (µg/Kg)								
Acetone					36		NA	105000000
1,2-Dichloroethene (total)							NA	21500000
2-Butanone					6		NA	46500000
Benzene							NA	8900
Carbon Disulfide							NA	1400000
Chloroform							NA	NA
Chloromethane							NA	NA
Ethylbenzene							NA	480
Methylene Chloride	8		10				NA	NA
Tetrachloroethene							NA	10500000
Toluene		2 J		[illegible] J	2		NA	1250000
Trichloroethene				7			NA	41000
Xylene (total)							NA	2150000000

No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.2. Soil Gas Confirmation Detected Semivolatile Organic Compounds (cont.)

ANALYTE	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	SGC NAC 000015	Background	10^{-6} Construction Worker Guidelines
SEMIVOLATILES (μg/Kg)								
Acenaphthene							NA	NA
Acenaphthylene							NA	NA
Anthracene							NA	320000000
Benzo(a)anthracene	57 J				18 J		NA	4100
Benzo(a)pyrene	65				21 J		NA	410
Benzo(b)fluoranthene	67 J				22 J		NA	4100
Benzo(g,h,i)perylene	[illegible] J						NA	NA
Benzo(k)fluoranthene	58 J				17 J		NA	41000
Bis(2-ethylhexyl)phthalate		71 J		36 J	35 J		NA	215000
Butylbenzylphthalate							NA	215000000
Carbazole							NA	NA
Chrysene	68 J		20 J		22 J		NA	410000
Di-n-butyl phthalate							NA	105000000
Di-n-octyl phthalate							NA	21500000
Dibenz(a,h)anthracene							NA	410
Dibenzofuran							NA	NA
Diethyl phthalate							NA	NA
Fluoranthene	110 J		31		38 J		NA	42500000
Fluorene							NA	NA
Indeno(1,2,3-cd)pyrene	36 J						NA	4100
2-Methylnaphthalene							NA	NA
Naphthalene						61 J	NA	NA
Phenanthrene	53 J						NA	NA
Phenol							NA	650000000
Pyrene	120				37 J		NA	32000000

No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.2. Soil Gas Confirmation Detected Semivolatile Organic Compounds (cont.)

ANALYTE	SGC NAC 000016		SGC NAC 000017		SGC SAN 000018		SGC NAC 000020		SGC NAC 000021		SGC NAC 000024		Background	10^{-6} Construction Worker Guidelines
SEMIVOLATILES (μg/Kg)														
Acenaphthene							21	J					NA	NA
Acenaphthylene									44	J			NA	NA
Anthracene									30	J			NA	320000000
Benzo(a)anthracene	47	J			48	J	130	J	110	J			NA	4100
Benzo(a)pyrene	42	J			68	J	150	J	130	J			NA	410
Benzo(b)fluoranthene	39	J			59	J		J	88	J			NA	4100
Benzo(g,h,i)perylene	33	J			49	J	100	J	100	J			NA	NA
Benzo(k)fluoranthene	46	J			62		37						NA	41000
Bis(2-ethylhexyl)phthalate	100	J			100						2	J	NA	215000
Butylbenzylphthalate													NA	215000000
Carbazole									21				NA	NA
Chrysene	51	J			54	J	220	J	170	J			NA	410000
Di-n-butyl phthalate													NA	105000000
Di-n-octyl phthalate											8	J	NA	21500000
Dibenz(a,h)anthracene					40	J	24	J	28	J			NA	410
Dibenzofuran													NA	NA
Diethyl phthalate													NA	NA
Fluoranthene	100	J	28	J	84	J	180	J	320	J			NA	42500000
Fluorene									26	J			NA	NA
Indeno(1,2,3-cd)pyrene	27	J			53	J	46	J	7	J			NA	4100
2-Methylnaphthalene													NA	NA
Naphthalene													NA	NA
Phenanthrene	63	J			27	J			220	J			NA	NA
Phenol													NA	650000000
Pyrene	87	J	26	J	91								NA	32000000

No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
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l Gas Confirmation Detected TAL Inorganics (cont.)

	14		SGC NAC 000015		SGC NAC 000016		SGC NAC 000017		SGC NAC 00018		Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)												
Aluminum	8460		17700		7370		14100		20000		130	19000	NA
Antimony												NA	425
Arsenic	1.2	BJ	7		3.6	J	3.4		2.4	B	4.1	8.6	320
Barium	53.		110		51.3	B	68.7		119		21.4	B	180	75000
Beryllium	0.0	B	0.68		0.24	B	0.46		0.98		0.2	1.3	0.7
Bismuth							0.82	B	1.2	B		NA	NA
Cadmium	4.6		7.7		3.7		5.7		8.6			2.1	1050
Calcium	22000	J	9420		342000		133690		23800		157000	310000	NA
Chromium	10.8		2		9.1		17.7		24.5		9.3	20	1050000
Cobalt	7.5		13.9		5.8	B	11.6	B	18.5		5.6	19	NA
Copper	13.5	J	22.4		12.2		19.3		26.9		11.6	26	NA
Cyanide							1.0					ND	21400
Iron	21100		36300		16600		26600		40000		13600	35000	NA
Lead	29	J	12.9		14.3		14.1		27.5		8.2	48	NA
Lithium	.8	B	30.7		15.0	B	25.1		34.1		18.1	26	NA
Magnesium	7250	J	8190		4760		14600		6250		47700	40000	NA
Manganese	543		939		689		641		1360		3	1400	135000
Mercury									0.07	B		NC	320
Molybdenum	0.81		1.3	B	0.51	B	1.3	B	0.76	B	0.82	B	27	NA
Nickel	17.6		31.4		13.8		23.9		34.4		13.5	32	21500
Potassium	1100	B	2	B	1010	B	2090	B	3680		1040	B	1900	NA
Selenium												NA	NA
Silver											0.4	B	1700	5500000
Sodium	328	BJ	142	B	248	B	398	B	209	B	8	B	240	NA
Thallium												460	NA
Tin	1.1	B	0.8	B			1.7	B	3.3	B		20	NA
Vanadium	12.9		29.4		10.7		23.8		30.2		10.3	25	7500
Zinc	44.9		2.5		67.7		70.5		103		41.2	140	320000

Table A.6. Soil Gas Confirmation Detected Radionuclides (cont.)

ANALYTE	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	SGC SAN 000018	SGC NAC 000019	SGC NAC 000020	SGC NAC 000021	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)									
Americium-241		0.162						ND	4.95
Bismuth-207		0.0183						ND	0.175
Bismuth-210		-0.00477						ND	NA
Cesium-137		0.0763	0.582				0.193	0.42	0.46
Cobalt-60		0.0142						NC	0.1
Plutonium-238	0.0118	0.253	0.200	0.684	0.121	0.721	[illegible]72	0.13	5.5
Plutonium-239/240		0.00413	0.0166	0.00487			0.005[illegible]	0.18	5.5
Potassium-40	19.2	15.2	29.1	10.1	7.90[illegible]	24.7	41.8	37	NA
Radium-226	1.40	0.934	0.960	0.677	0.[illegible]8	0.841	1.03	2	0.14
Thorium-228	1.37	1.04	1.10	0.465	0.378	0.[illegible]2	1.1[illegible]	1.5	0.85
Thorium-230	1.48	1.36	1.01	0.5[illegible]2	0.749	1.08	[illegible].701	1.9	44
Thorium-232	1.43	0.894	1.26	0.508	0.375	0.843	0.970	1.4	50
Uranium-234	1.01	0.765	0.698	0.523	0.440	0.751	[illegible]1	1.1	37.5
Uranium-235	0.0927	0.0394	0.0403			0.0[illegible]	0.037	0.11	3.35
Uranium-238	0.955	0.993	0.852	0.496	0.691	0.825	0.822	1.2	11