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EG&G MOUND-30-03-04-02--9704140009

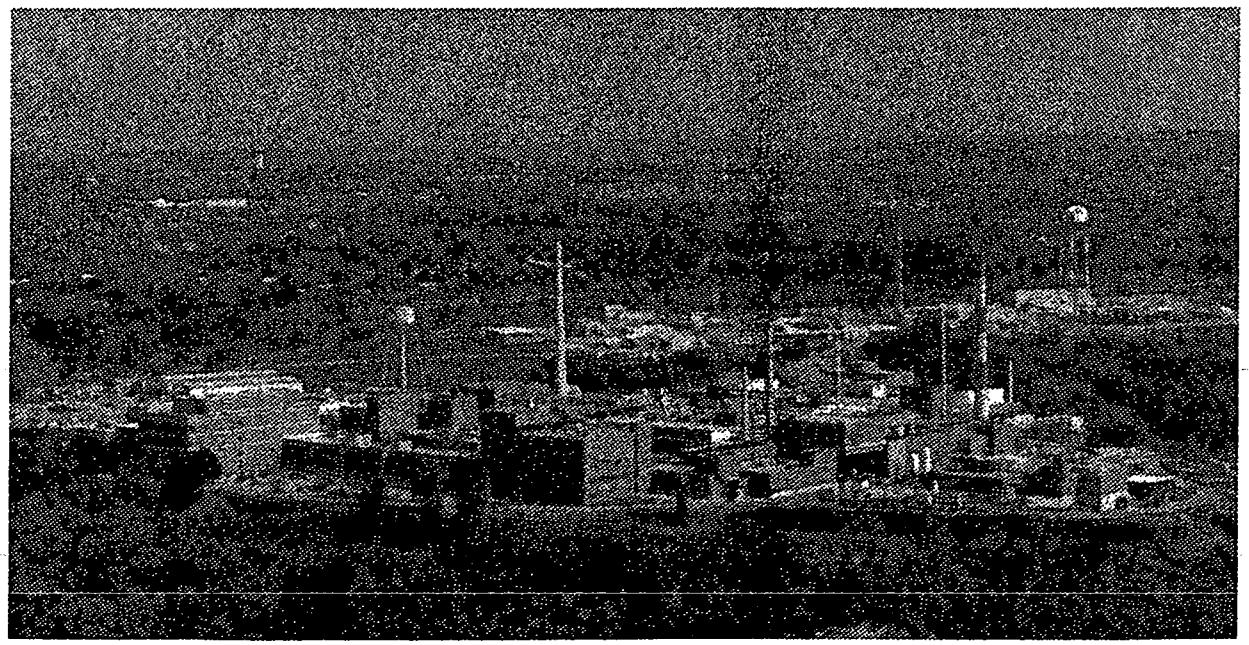
MOUND

Environmental Restoration Program

MOUND PLANT

Potential Release Site Package

PRS # 367



MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PACKAGE

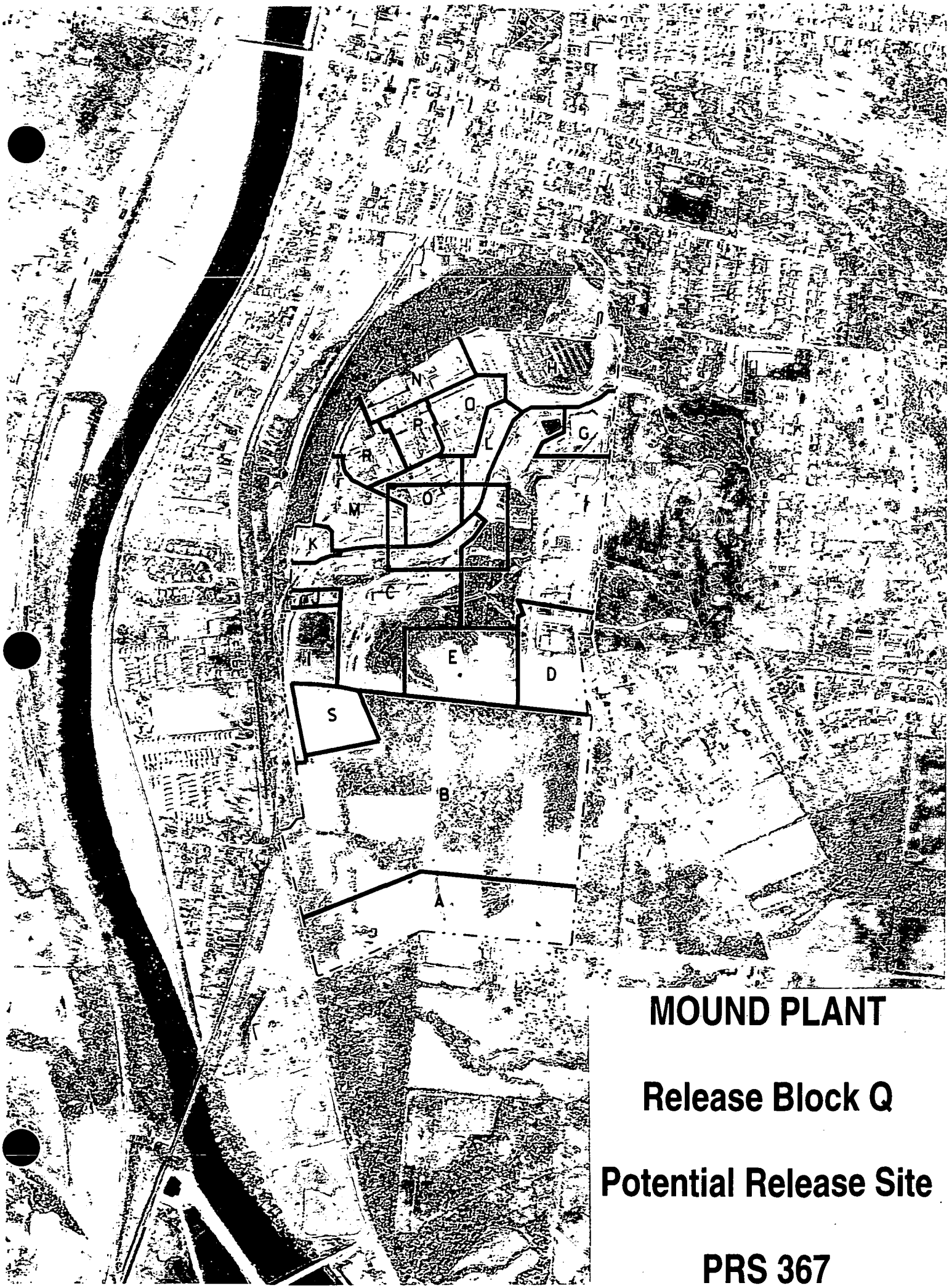
Notice of Public Review Period

The following potential release site (PRS) packages will be available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio beginning February 27, 1997. Public comment will be accepted on these packages from February 27, 1997, through April 3, 1997.

PRS 13:	Former Treatment Site - Trash Incinerator
PRS 23:	Solvent Waste Tank - Building 48 Settling Basin
PRS 24:	Solvent Storage Tank - Building 48
PRS 358:	Soil Contamination
PRS 365:	Soil Contamination
PRS 366:	Soil Contamination
PRS 367:	Soil Contamination
PRS 390/393/394:	Soil Contamination

Questions can be referred to Mound's Community Relations at (937) 865-4140.

REV	DESCRIPTION	DATE
PUBLIC RELEASE **0**	Available for comments.	**Oct. 3, 1996**
FINAL **1**	Comment period expired. No comments. Recommendation page annotated.	Apr. 7, 1997



MOUND PLANT

Release Block Q

Potential Release Site

PRS 367

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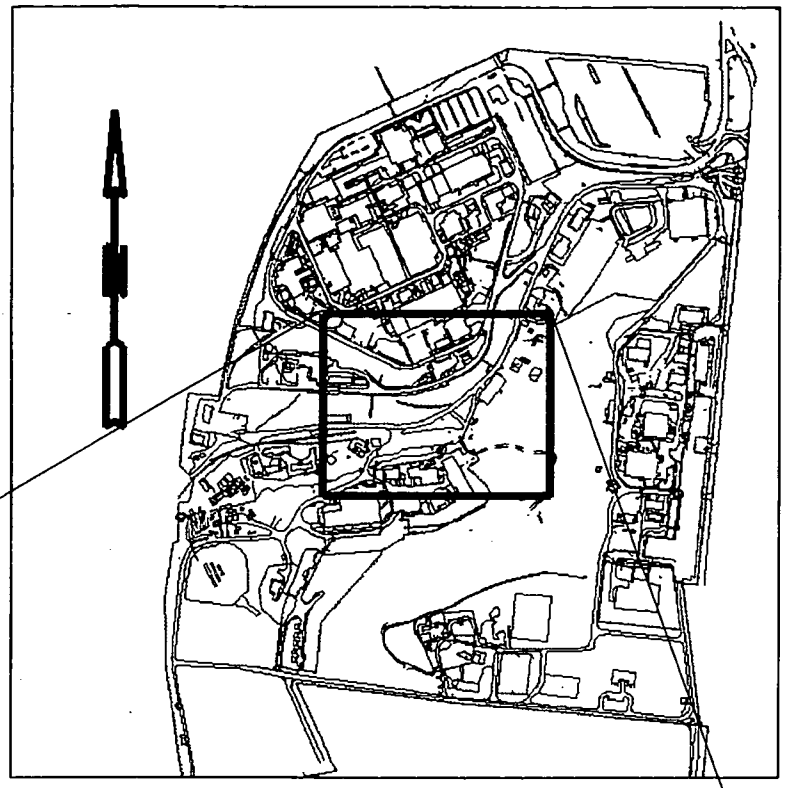
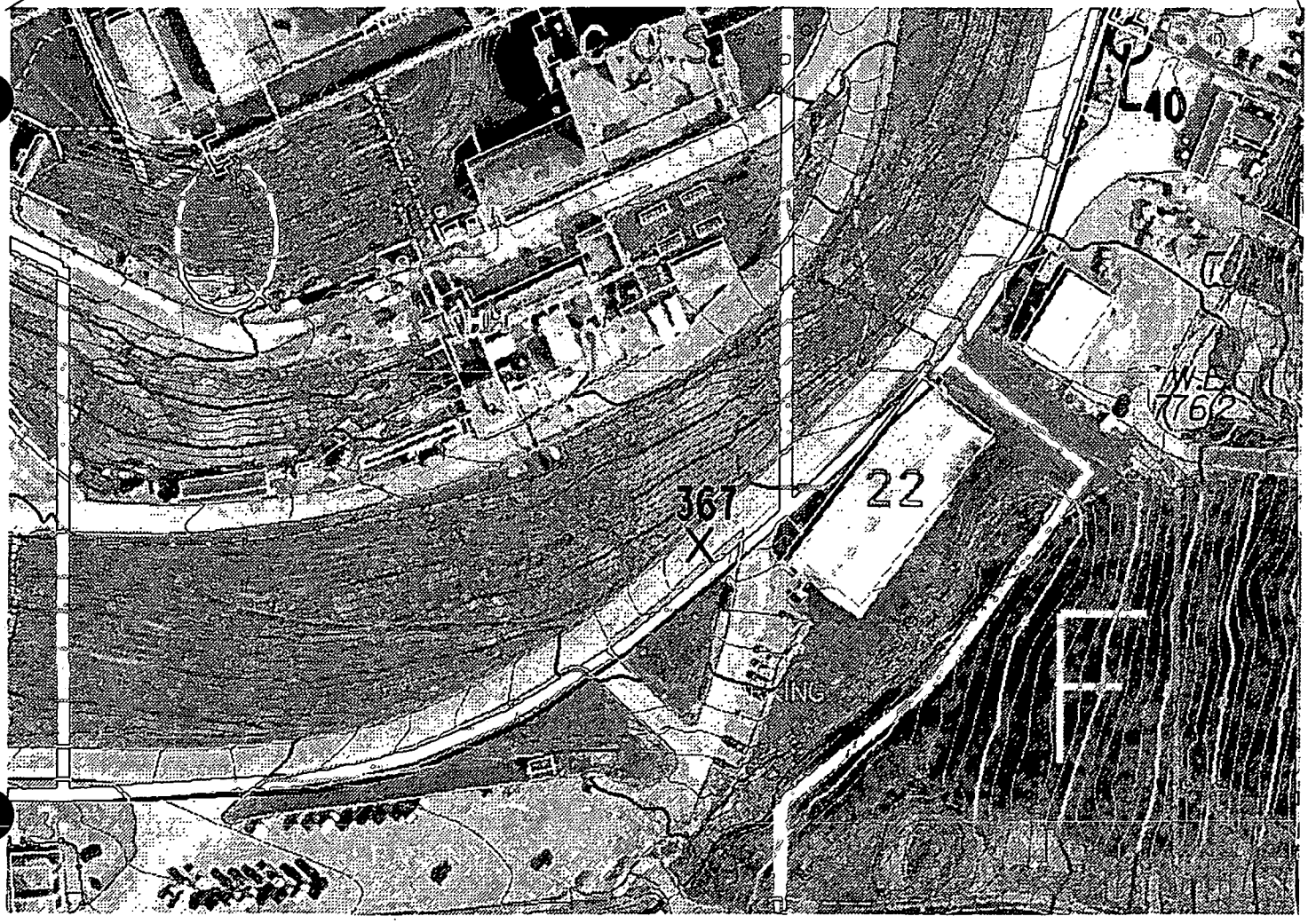
Mound Plant

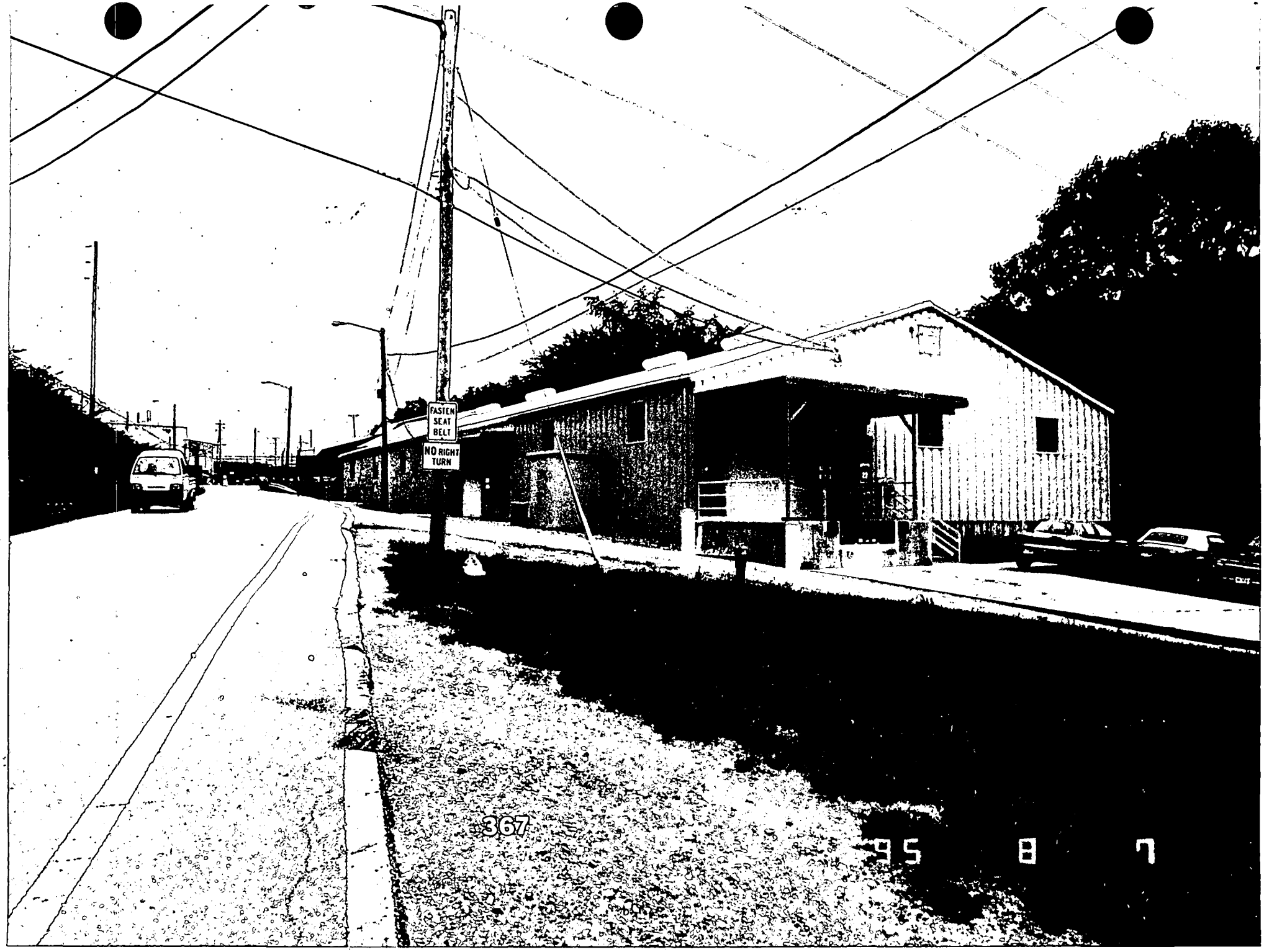
Release Block Q

Potential Release Site

PRS 367



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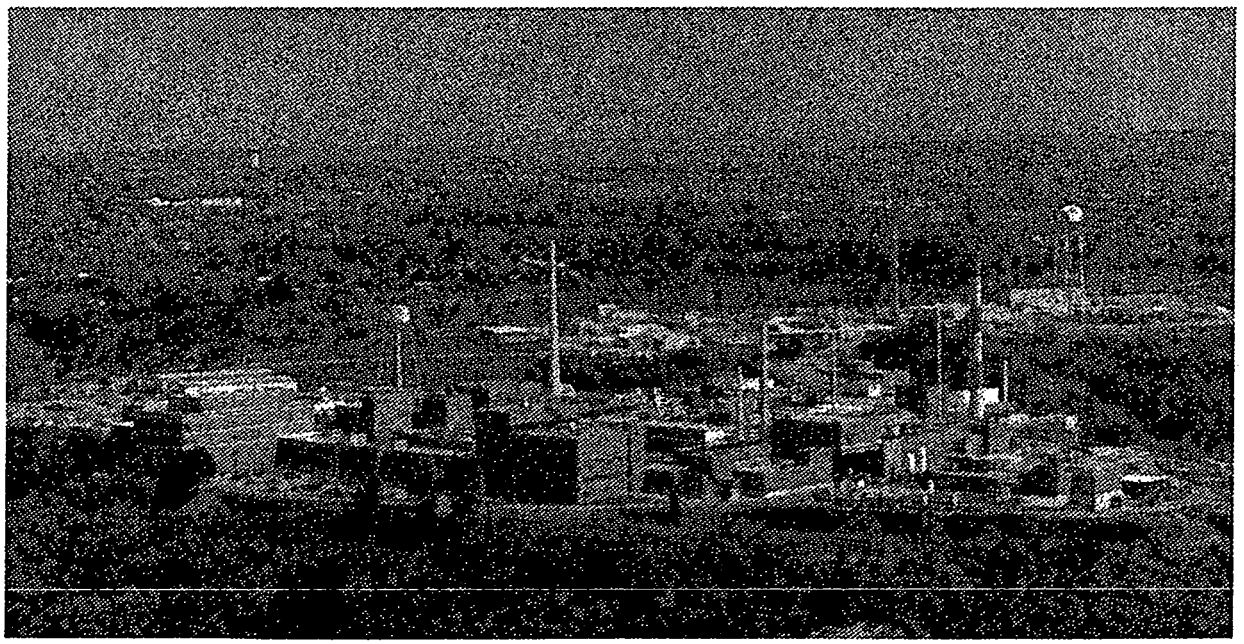
MOUND

Environmental
Restoration
Program

MOUND PLANT

Potential Release Site Package

PRS # 367



PRS 367

PRS HISTORY:

This area was identified as a potential release site (PRS) because of relatively elevated soil gas readings in June 1994 as part of the OU5, Operational Area Phase I Investigation Non-AOC Field Report.[1]

PROCESS DESCRIPTION:

The historical data suggests that no radioactive or hazardous waste processes are known to have occurred at this location. This PRS is located along the roadway approximately 100 ft. southwest of Building 22, which was used to stage incoming equipment prior to distribution.

CONTAMINATION:

In 1984 the Site Survey Project investigated radiological contamination at this PRS location. Subsurface soil samples were radiochemically analyzed for plutonium-238 and thorium-232.[2] The results indicated no elevated levels of radiological activity. The maximum level of plutonium-238 was found to be 0.16 pCi/g.[2] Mound as low as reasonably achievable (ALARA) guideline for plutonium is 25 pCi/g. No thorium was detected above Mound's soil screening facility detection limit of 2 pCi/g.

The OU5, Operational Area Phase I Investigation recently (1994) conducted an investigation using a field instrument for the detection of low-energy radiation (FIDLER) survey; a surface soil sampling and analysis at the Mound soil screening facility; and a passive soil gas survey to detect volatile and semi-volatile organic compounds.

Results from the FIDLER survey and the Mound Soil Screening Analysis indicated no elevated levels of radiological contaminants.

The PETREX passive soil gas survey indicated elevated readings for total aromatic hydrocarbons, total semivolatile hydrocarbons, and total C5-C11 petroleum hydrocarbons in this area. The identity and concentration of the contaminating substance is not yielded by the PETREX soil gas method.

READING ROOM REFERENCES:

1) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, June 1995. (pages 6-11)
2) OU9, Site Scoping Report, Vol. 3, Radiological Site Survey Report, June 1993. (pages 12-18)

PREPARED BY:

Jean Boling, Member of EG&G Technical Staff
Richard Bauer, Member of EG&G Technical Staff
James Rigano, Member of EG&G Technical Staff

PRS 367
(SUPPLEMENTAL DATA)

CONTAMINATION:

Potential Release Site (PRS) 367 was identified as a potential release site as a result of the qualitative PETREX passive soil gas survey in 1994. A subsequent quantitative investigation, the ***Soil Gas Confirmation Investigation***, was performed in February 1996.[4] This survey sampled the PETREX soil gas locations with the highest PETREX ion counts in the western sector of the Mound plant. Locations with the highest ion counts were PETREX locations 1015, 1066 and 1093 which correspond to *Soil Gas Confirmation* samples 7, 11 and 18.

PRS 367 was not directly sampled but had lower ion counts than the locations that were sampled, in the western sector. Hence, the *Soil Gas Confirmation* results for the PETREX locations with the highest counts in Mound's western sector (samples #7, 11 and 18) provide correlating evidence about the risk of contamination at other western sector locations with similar or lower ion counts (i.e. PRS 367). The map on page 23 shows the PRS 367 as well as the *Soil Gas Confirmation* sample locations in Mound's western sector.

The following table lists both the maximum qualitative PETREX ion counts in Mound's western sector and the corresponding quantitative *Soil Gas Confirmation* sampling results. The table also compares the results to the qualitative PETREX ion counts for PRS 367. The PETREX sample corresponding to PRS 367 is listed as sample no. 1084.

PETREX Soil Gas Contaminant Family	Maximum Ion Counts[1]	Confirm Sample #	Confirmation Sample Results that Exceed Guideline Criteria (GC)	Ion Counts at PRS 367	
Total Aromatic Hydrocarbons	21,843,639	(#18)	None	4,169,821	(# 1084)
Total Semivolatile Hydrocarbons	1,389,465	(#18)	None	527	(# 1084)
Total C5-C11 Petroleum Hydrocarbons	30,786,838	(#7)	None	4,386,123	(# 1084)
Total Halogenated Hydrocarbons	892,683	(#11)	None	Not detected	(# 1084)

The correlations made above make no conclusions about individual contaminant concentrations at PRS 367 only that the overall health risk at PRS 367 is expected to be similar to or less that of the PETREX locations with the highest measured ion counts.

SUPPLEMENTAL REFERENCES:

3) Code of Federal Regulations, 40 CFR 192.41 and 40 CFR 192.12.
4) Soil Gas Confirmation Sampling, (Revision 0), May 1996. (pages 19-34)

MOUND PLANT
PRS 367
SOIL CONTAMINATION -

RECOMMENDATION:

PRS 367 is a soil potential release site (PRS) located in the western sector of the original Mound plant. This soil location was identified as a PRS due to qualitative hydrocarbon detections found during the PETREX soil gas portion of the ***OU5, Non Area of Concern*** investigation. No radioactive or hazardous waste generating processes or activities are known to have occurred at PRS 367.

In 1996, the Soil Gas Confirmation Sampling effort sampled the locations with the highest ion counts (confirmation sample locations 7, 11, and 18) in the western sector and discovered no contamination above the 10^{-6} risk range. PRS 367 was not sampled as part of the Soil Gas Confirmation Sampling but the PRS had lower ion counts than confirmation sample locations 7, 11, and 18. This implies that PRS 367 has similar or lower health risk than confirmation sample locations 7, 11, and 18.

All radiological samples collected near this PRS indicate that radionuclides are below their applicable 10^{-6} Risk Based Guideline Values, ALARA, regulatory, or background levels. Therefore, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, 12/17/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer, 12/17/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel, 12/18/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 2/27/97 to 4/3/97

☒ No comments were received during the comment period.

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

REFERENCE MATERIAL

FOR

PRS 367

Environmental Restoration Program

OPERABLE UNIT 5
OPERATIONAL AREA PHASE I INVESTIGATION
NON-AOC 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

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

VOLUME II - APPENDICES A-F

December 1994

Working Draft

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

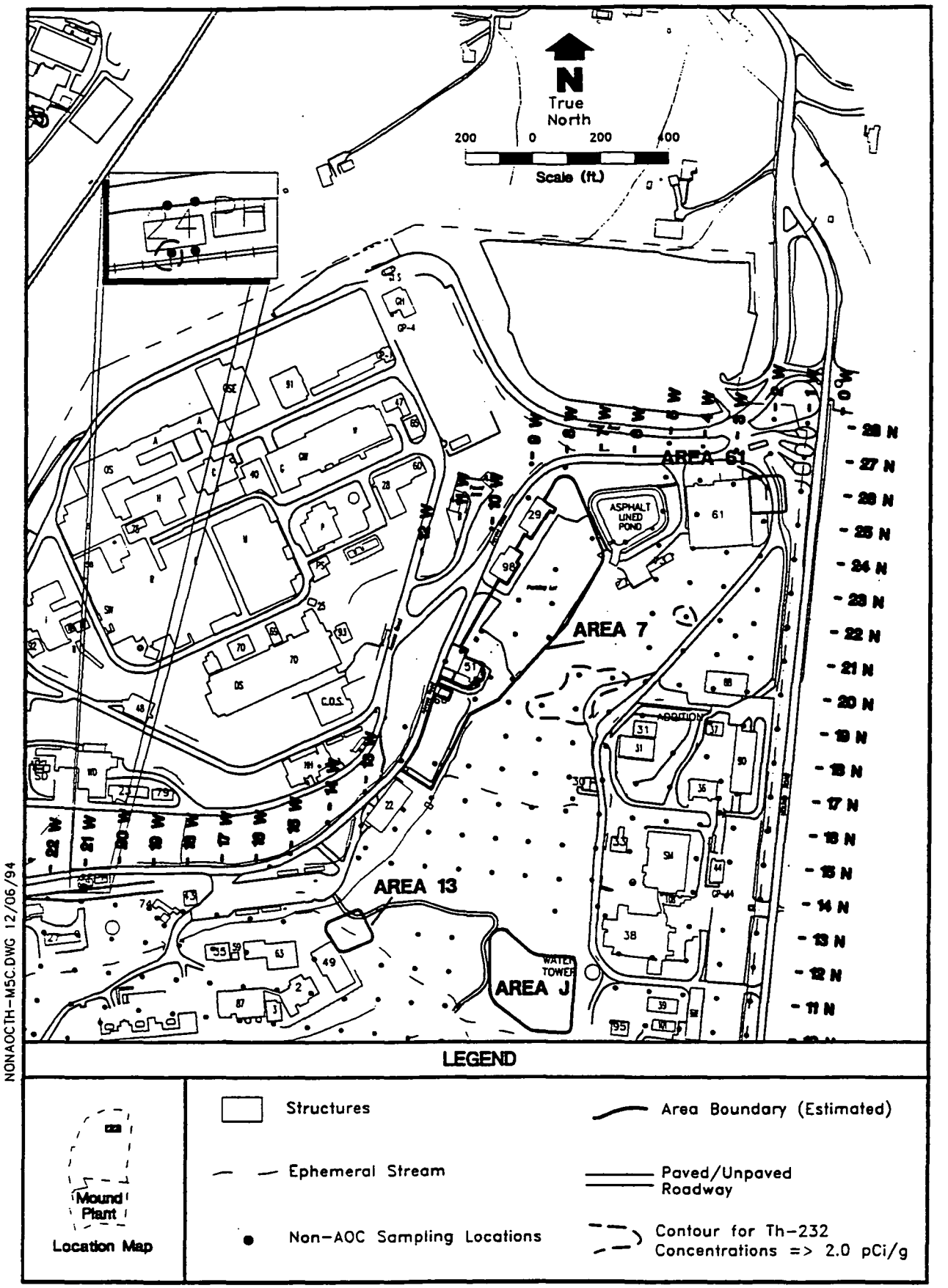


Figure 2.2. Locations of Elevated Surface Soil Th-232 Activity

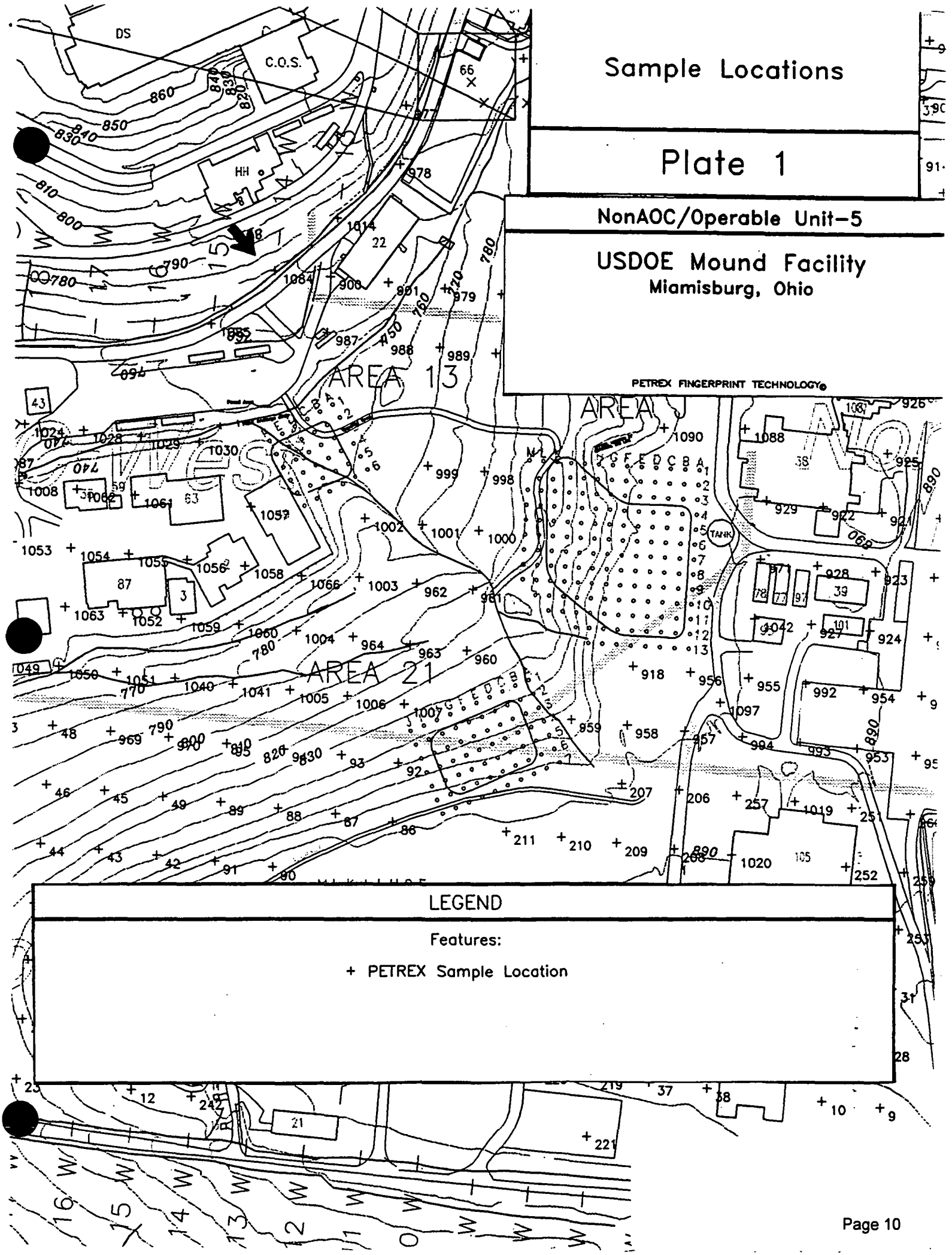
APPENDIX D

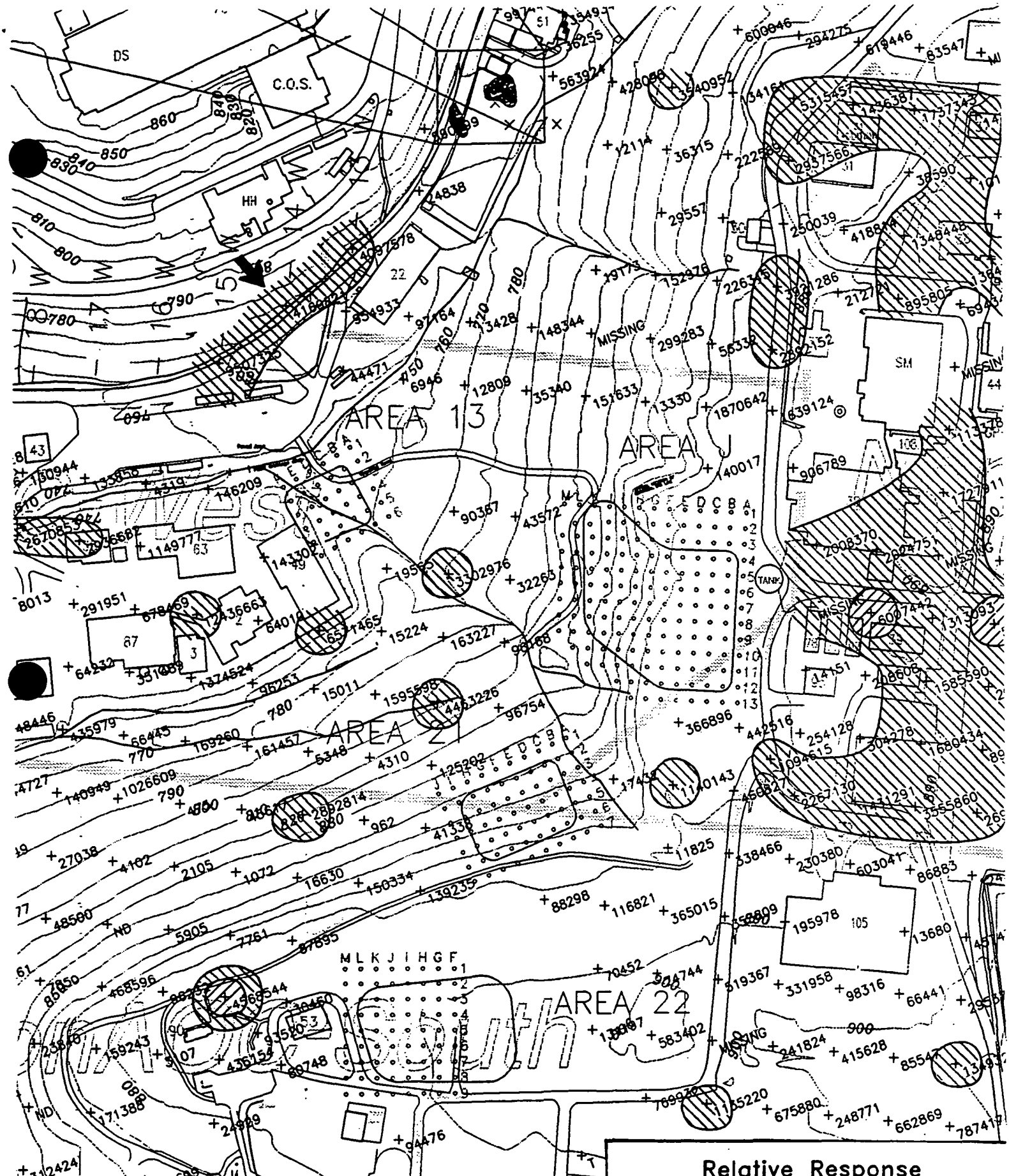
RADIOLOGICAL DATA (FIDLER SURVEY MOUND SOIL SCREENING FACILITY DATA) FOR NON-AOC POINTS

	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:
15N01	253.5	190	12.48	10.0	NC	21	a	1.1	a
15N02	122.2	110	5.59	4.5	NC	WIPE	c	WIPE	c
15N03	130	80	6.5	6.0	NC	0	a	0	a
15N06	130	75	6.5	5.0	NC	NR		NR	
15N07	170.3	115	9.72	8.5	NC	30	b	1	a
15N08	170.3	155	9.72	9.0	NC	NR		NR	
15N09	170.3	125	9.72	10.5	NC	17 17	a a	1.2 1.1	a a
15N10	170.3	100	9.72	7.5	NC	19	a	0.9	a
15N11	170.3	120	9.72	8.5	NC	3	a	1	a
15N12	157.3	100	8.45	6.0	NC	17	a	0.6	a
15N13	157.3	85	8.45	4.5	NC	WIPE	c	WIPE	c
15N14	157.3	108	8.45	6.0	NC	NR		NR	
16N01	253.5	170	10.0	10.5	NC	17	a	1.1	a
16N02	122.2	70	5.59	4.5	NC	WIPE	c	WIPE	c
16N03	130	100	6.5	5.0	NC	0	a	0.5	a
16N04	130	150	6.5	9.0	NC	78	b	1.2	a
16N05	NC	NC	NC	NC	NC	243	b	1.2	a
16N06	130	45	6.5	4.5	NC	WIPE	c	WIPE	c
16N07	170.3	80	9.72	5.0	NC	4	a	1	a
16N08	170.3	45	9.72	4.5	NC	9	a	0.6	a
16N09	170.3	130	9.72	7.5	NC	NR		NR	
16N10	170.3	125	9.72	6.5	NC	NC		NC	
16N11	157.3	110	8.45	5.5	NC	NC		NC	
16N13	157.3	55	8.45	5.5	NC	NR		NR	
17N01	253.5	100	12.48	5.5	NC	0	a	0.5	a
17N02	130	80	6.5	4.5	NC	WIPE	c	WIPE	c
17N04	130	80	6.5	4.0	NC	WIPE	c	WIPE	c
17N05	130	90	6.5	4.0	NC	WIPE	c	WIPE	c

FIDLER DATA

MOUND SOIL SCREEN DATA


Sample Locations
Plate 1
NonAOC/Operable Unit-5
USDOE Mound Facility
Miamisburg, Ohio
PETREX FINGERPRINT TECHNOLOGY©
AREA 13
AREA 21
AREA J
LEGEND
Features:
+ PETREX Sample Location



Features:

+ PETREX Sample Location

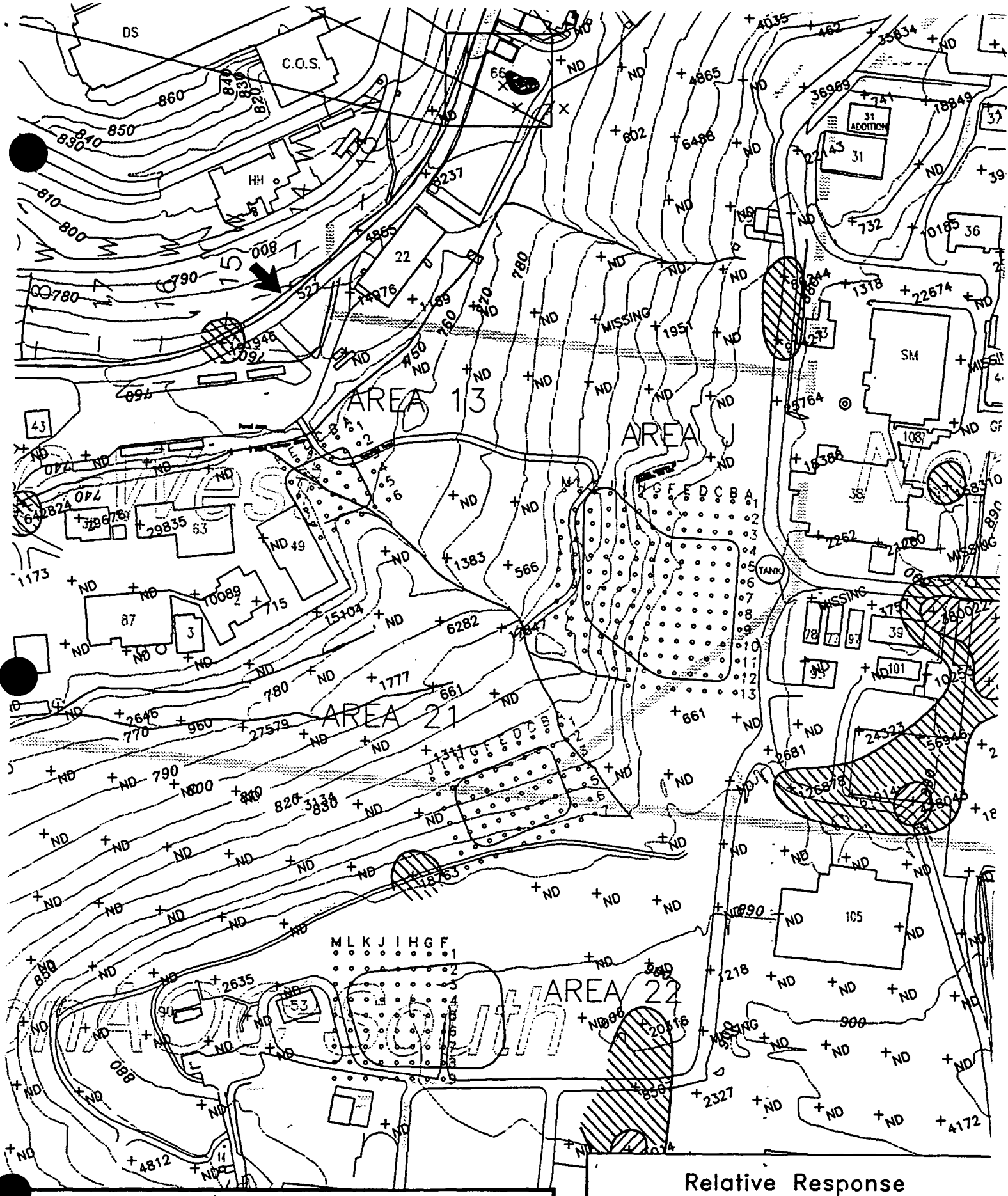
ND Not Detected

T Denotes interference by terpenes; see text.

Relative Response

Total Aromatic Hydrocarbons

Plate 2



Features:

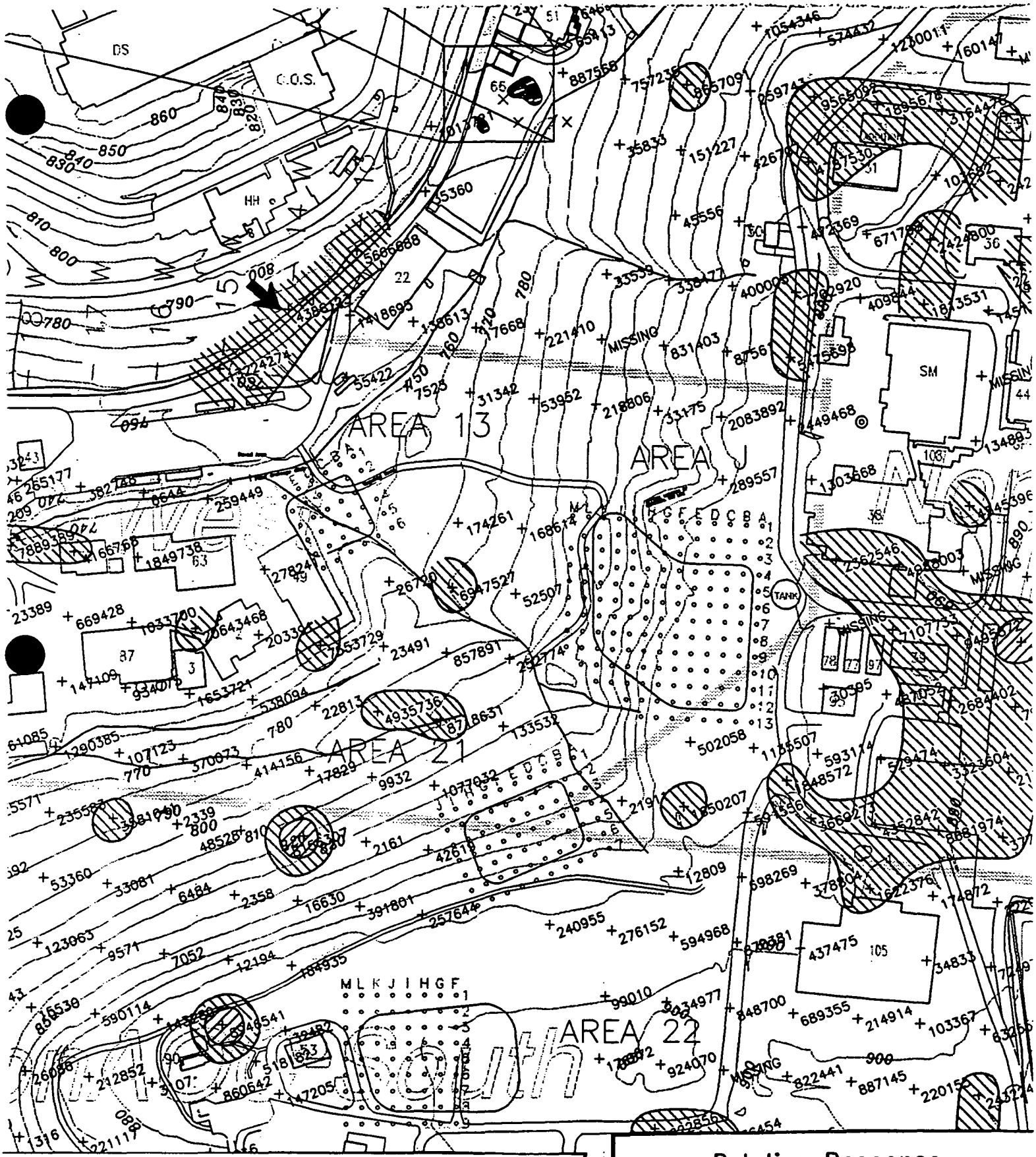
+ PETREX Sample Location

ND Not Detected

Relative Response

Total Semivolatile Hydrocarbons

Plate 3



Features:

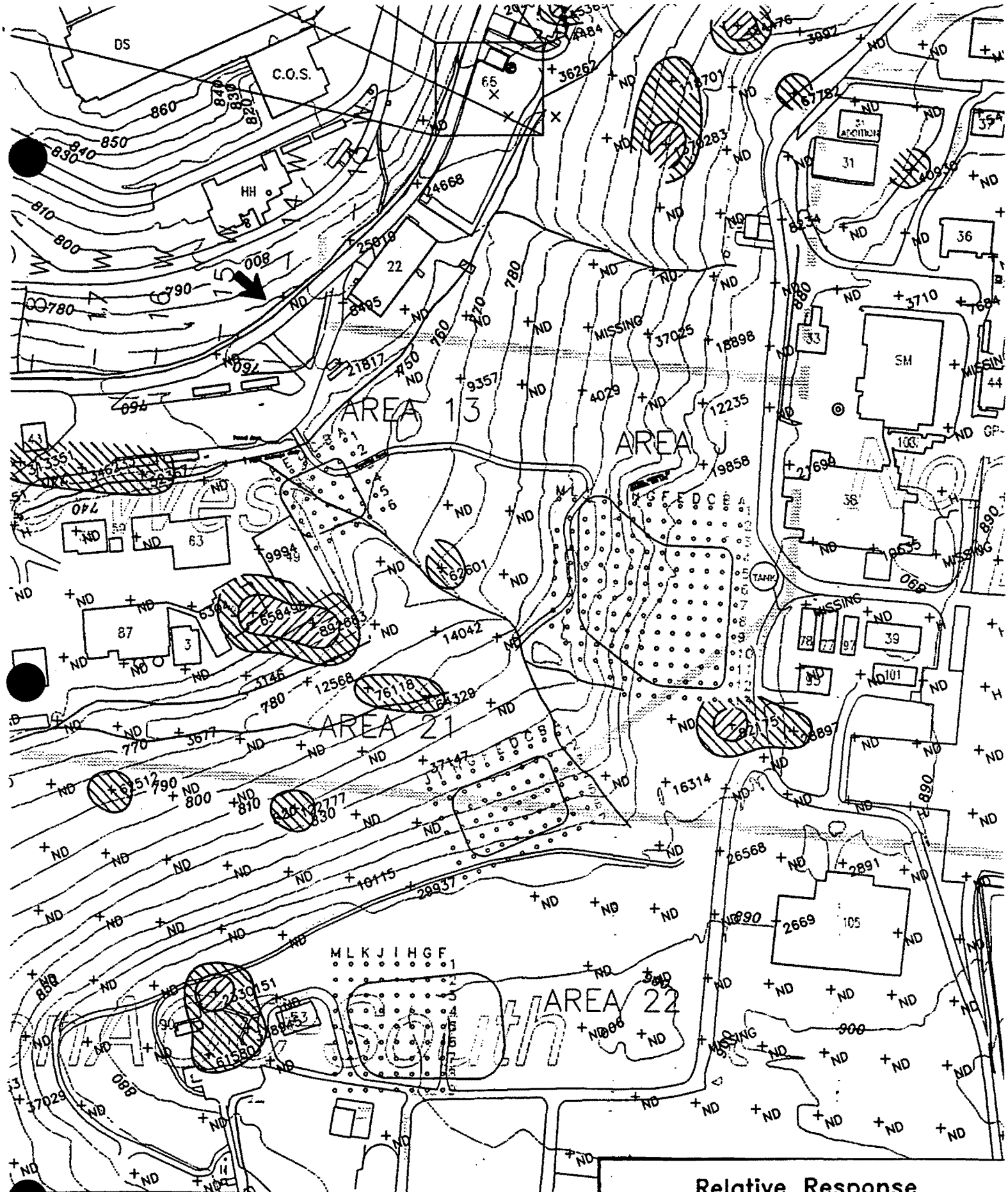
+ PETREX Sample Location

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

Page 10.4

Plate 5

Table 2 (cont'd)

Sample #	Total Aromatic Hydrocarbons (a)	Total Semivolatile Hydrocarbons (b)	Total C5 to C11 Petroleum Hydrocarbons (c)	Total Halogenated Hydrocarbons (d)
1066	6,571,465	15,104	7,553,729	892,683
1070	58,029	ND	183,636	3,689
1071	4,057,383	579,124	9,891,577	H
→ 1084	4,169,821	527	4,386,123	ND
1085	9,507,325	191,946	13,224,274	ND
1086	64,076	1,562	234,446	8,137
1087	28,610	ND	66,209	8,451
3087 (e)	38,480	ND	83,398	7,390
1088	906,789	18,388	1,303,668	21,699
1089	1,639,124	25,764	2,449,468	ND
1090	140,017	ND	289,557	19,858
1091	2,507	ND	2,507	ND
1092	88,618	1,896	252,302	17,004
1093	21,843,637	1,389,465	29,658,830	ND
1096	395,678	1,440	1,161,588	168,226
6001 *	ND	ND	544	ND
6002 *	2,315	ND	2,315	ND
6003 *	ND	ND	ND	ND

Key: (a) Intensity of response to ions of atomic masses 78, 92, 106, 120, 134, 148, 162, 176, 190, and 204.
(b) Intensity of response to ions of atomic masses 128, 142, 153, 156, 178, 184, 198, 202, and 212.
(c) Intensity of response to ions of atomic masses 70, 72, 78, 84, 86, 92, 98, 100, 106, 110, 112, 114, 120, 124, 126, 128, 134, 138, 140, 142, 148, 152, 154, and 156.
(d) Intensity of response to ions of atomic masses 101, 130, 146, 151, and 164.
(e) Duplicate of preceding sample.
H High levels of petroleum hydrocarbons have interfered with the identification of halogenated hydrocarbons in this sample; see text.
T High levels of terpenes have interfered with the identification of petroleum hydrocarbons in this sample; see text.
ND The targeted compounds were not detected in this sample.
* Travel Blank

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

The drilling and sampling were performed using an auger drill rig and a 2-ft, split-barrel sampler. As the split-barrel sampler was removed from the borehole, it was monitored for radioactivity contamination by Mound Plant health physics personnel using a FIDLER to detect radioactivity contamination that would pose a hazard to the workers present. After the soil was removed from the sampler and placed in sample containers, field team members wearing gloves brushed the remaining soil out of the sampler. The gloves were then monitored with an alpha scintillometer before the split-barrel sampler was used again. However, no standard decontamination was performed.

The core locations are shown in Plate 1. The core locations were surveyed by a licensed surveyor after drilling was completed. The available reports submitted to Mound Plant by the drilling subcontractors are presented in Appendix B.

2.1.4. Sample Analyses

2.1.4.1. FIDLER Screening

In order to identify samples with concentrations of plutonium-238 exceeding 25 pCi/g and total thorium exceeding 2 pCi/g, all of the soil samples collected were pulverized and then screened using a Bicron® FIDLER at the Mound Plant Soil Screening Facility, known as trailer 15 at the time of the Site Survey Project. The Soil Screening Facility is now located in the H Building at Mound Plant (Plate 1). The minimum detectable activity at which plutonium-238 can be reliably detected at the Mound Plant screening facility is estimated to be 25 pCi/g (Draper 1986b). The detection of plutonium-238 at lesser concentrations (12-25 pCi/g) was unreliable and had an estimated error of ±75 percent. The estimated error decreased with increasing sample activity; for samples with 25 to 100 pCi/g of plutonium-238, the estimated error was ±35 percent, and for samples with >100 pCi/g, the estimated error was ±30 percent (Casella and Bishop 1984). The minimum detectable activity for thorium from FIDLER screening was estimated to be about 2 pCi/g (Stought et al. 1988). The Mound Plant procedure for screening soil samples is provided in Appendix A.

2.1.4.2. Radiochemical Analysis for Plutonium-238

Because of the high error (±75 percent) involved in the FIDLER screening of samples containing less than 25 pCi/g of plutonium-238, all soil samples were radiochemically analyzed by Mound Plant for plutonium-238. The lower detection limit (LDL) for plutonium-238 by this method was estimated to be 0.01 pCi/g, with a relative precision (two standard deviations) of 25 percent. The overall precision of the plutonium-238 measurements was reported to be about 18 percent (DOE 1991b). The Mound

Plant procedure for the radiochemical analysis of soil samples for plutonium-238 is provided in Appendix A.

2.1.4.3. Radiochemical Analysis for Thorium

Samples with thorium concentrations in excess of 2 pCi/g by FIDLER screening were also radiochemically analyzed for thorium, resulting in the radiochemical analysis of about 12 percent of the samples. The LDLs for the thorium isotopes using radiochemical procedures were estimated to be

- 0.3 pCi/g for thorium-228, with a relative precision of 60 percent;
- 0.3 pCi/g for thorium-230, with a relative precision of 30 percent; and
- 0.1 pCi/g for thorium-232, with a relative precision of 70 percent.

The overall precision for the thorium measurement was reported to be about 25 percent. The thorium results were reported in pCi of total thorium per gram of soil, isotopes were not identified. The Mound Plant procedure for the radiochemical analysis of soil samples for thorium is provided in Appendix A.

2.1.4.4. Gamma Spectroscopy

Gamma spectroscopy was performed by Mound Plant on approximately 350 (18 percent) of the soil samples in order to verify the identity of the radionuclides present when screening indicated the presence of gamma-emitting radionuclides, but little excess plutonium or thorium was identified by radiochemical analysis. Gamma spectroscopy is capable of detecting a variety of gamma-emitting radionuclides; the radionuclides detected in samples collected during the Site Survey Project included cobalt-60, cesium-137, radium-226, actinium-227, and americium-241. No other gamma-emitting radionuclides with gamma energies below 1.5 millielectron volts (MeV) were detected, although the project report stated that subsequent sampling and analysis in some areas indicated bismuth-207 and bismuth 210m. No polonium-210 peaks were detected in the Site Survey Project samples, confirming that polonium-210, which was used at Mound Plant in the 1950s, is no longer present due to radioactive decay (half-life of 138.4 days). The LDLs for cesium-137, cobalt-60, and americium-241 were given with the original data, and were estimated to be 0.5 pCi/g for each. The LDLs for radium-226 and actinium-227 were estimated to be 1.0 pCi/g for both (Stought 1990). The Mound Plant procedure for gamma spectroscopy is provided in Appendix A.

ER PROGRAM

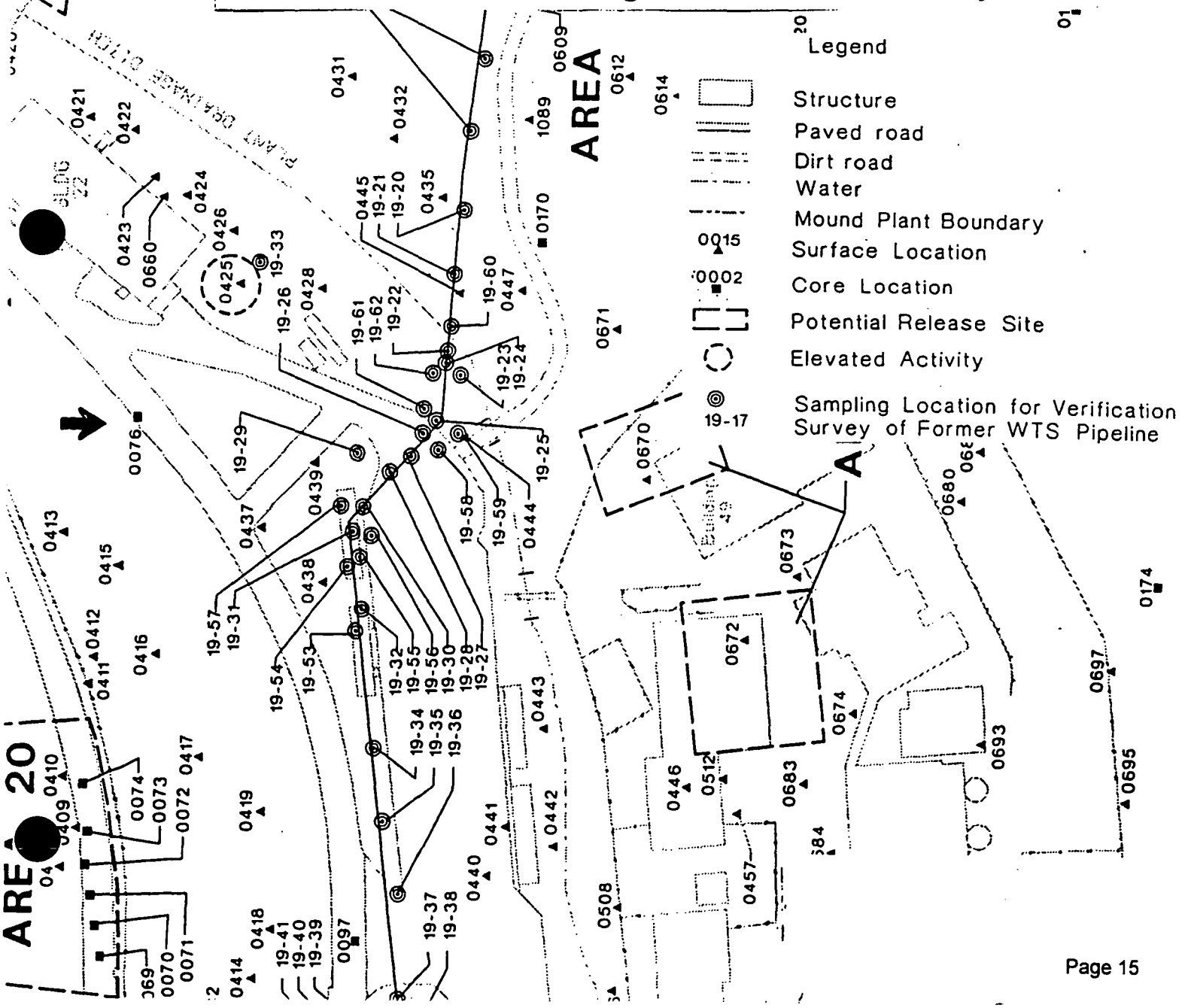
MOUND PLANT

Miamisburg, Ohio

PLATE 1
(1 of 2)

Site Survey Project Sampling Locations

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



Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-228 (pCi/g)	Am-241 (pCi/g)
S0425	2500	2945	4108	10-83	0	1.08	5.74					
S0426	2510	2910	10467	08-85	0	1.00	b					
S0427	2525	2670	6777	08-84	0	1.58	b					
S0428	2550	2970	6772	08-84	0	11.80	b					
S0429	2575	2670	6774	08-84	0	3.43	b					
S0430	2625	2645	4111	10-83	0	0.20[c]	b					
S0431	2625	2845	4110	10-83	0	1.79	b					
S0432	2635	2895	6780	08-84	0	5.78	b					
S0433	2650	2695	6778	08-84	0	0.98	b					
S0434	2650	2770	6773	08-84	0	12.10	b					
S0435	2650	2945	4109	10-83	0	0.83	b					
S0436	2685	2730	6779	08-84	0	7.83	b					
→ C0076	2400	3000	8290	11-84	36	0.15	b					
			8291	11-84	72	0.16	b					
			8292	11-84	126	0.11	b					
S0437	2450	3100	5878	07-84	0	1.52	b					
S0438	2474	3150	5879	07-84	0	0.27	b					
S0439	2500	3075	5880	07-84	0	0.49	b					
S0440	2500	3375	2984	10-83	0	0.96	b					
S0441	2525	3350	2982	10-83	0	0.07	b					

GAMMA SPECTROSCOPY

RADIOCHEMICAL ANALYSIS

Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
C0289	2422.7	2081.0	None[d]	07-84	0	NR	0.6					
			None[d]	07-84	12	NR	1.1					
			None[d]	07-84	24	NR	0.5					
			None[d]	07-84	36	NR	0.8					
			None[d]	07-84	48	NR	1.0					
			None[d]	07-84	60	NR	0.8					
C0290	2401.5	2102.1	None[d]	07-84	0	NR	0.7					
			None[d]	07-84	12	NR	0.8					
			None[d]	07-84	24	NR	0.8					
			None[d]	07-84	36	NR	0.8					
			None[d]	07-84	48	NR	0.6					
			None[d]	07-84	60	NR	0.9					
			None[d]	07-84	72	NR	0.8					
C0291	2915.3	2490.3	None[d]	07-84	0	NR	0.6					
			None[d]	07-84	12	NR	0.4					
			None[d]	07-84	24	NR	0.5					
			None[d]	07-84	36	NR	0.4					
			None[d]	07-84	48	NR	0.4					
			None[d]	07-84	60	NR	0.3					
			None[d]	07-84	72	NR	0.5					
			None[d]	07-84	84	NR	0.4					
			None[d]	07-84	96	NR	0.7					
			None[d]	07-84	108	NR	0.6					
			None[d]	07-84	120	NR	0.3					
			None[d]	07-84	132	NR	0.3					
S1092	2185	3362	8413	12-84	f	0.31	323.5[g]					

[a]C denotes core location and S denotes surface sample location on Plate 1.

[b]Thorium results of ≤ 2 pCi/g are listed as "b".

[c]Verification sample analyzed for QA/QC.

[d]No MRC ID assigned because *in situ* gamma spectrometry was performed for thorium-232.

[e]Gamma results could not be confirmed using the gamma spectroscopy printout given in this appendix.

[f]The depth for this sample was given as "SS". For mapping purposes (Plates 1 and 5), this is assumed to be a surface sample.

[g]Sample results were given isotopically for this sample and included 0.99 pCi/g thorium-228; 321 pCi/g thorium-230; and 1.5 pCi/g thorium-232, for a total of 323.5 pCi/g.

LDL - The sample result was below the Lower Detection Limit, which was estimated to be 0.5 pCi/g for cesium-137, cobalt-60, and americium-241. The LDL for radium-226 or actinium-227 was estimated to be 1 pCi/g.

NR - No result provided. (Note: no samples were taken for plutonium-238 when *in situ* gamma spectrometry was performed.)

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

Semivolatile Organic Compounds

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

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

Table I.2. Variance From 3-Foot Sampling Depth Specification

Location	Description of Variance
SGC-NAC-000001	Core sampler hit refusal at 2 feet.
SGC-NAC-000002	Relocated due to utilities.
SGC-NAC-000003	Core sampler hit refusal at 2 feet.
SGC-NAC-000004	Core sampler hit refusal at 18 inches.
SGC-NAC-000005	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-NAC-000006	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-NAC-000007	Core sampler hit refusal at 18 inches.
SGC-NAC-000008	Drilled to 2 feet due to utilities.
SGC-NAC-000010	Drilled to 1 foot; hand-augered rest due to utilities; flag against building, so sample taken 6 feet from flag.
SGC-NAC-000012	Drilled to 2 feet due to utilities.
SGC-SAN-000018	Core sampler hit refusal at 2 feet; relocated from inside clarifier.
SGC-NAC-000029	Core sampler hit refusal at 18 inches.
SGC-A61-000043	Sampled 1 foot from flag.
SGC-A61-000047	Drilled to 2 feet due to utilities.
SGC-A61-000048	Drilled to 2 feet due to utilities.
SGC-A61-000049	Relocated due to utilities.
SGC-A61-000051	Core sampler hit refusal at 18 inches.
SGC-A61-000052	Relocated due to utilities; core sampler hit refusal at 18 inches.
SGC-A61-000053	Core sampler hit refusal at 2 feet.
SGC-A13-000056	Core sampler hit refusal at 18 inches
SGC-A13-000058	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-A13-000060	Core sampler hit refusal at 1 foot.
SGC-AOJ-000064	Core sampler hit refusal at 2 - 3 inches.
SGC-AOJ-000066	Core sampler hit refusal at 4 inches.
SGC-AOJ-000067	Core sampler hit refusal at 6 inches.
SGC-AOJ-000069	Core sampler hit refusal at 2 feet.
SGC-A03-000080	Core sampler hit refusal at 20 inches
SGC-A03-000081	Drilled to 2 feet due to utilities.
SGC-A03-000082	Drilled to 1 foot, hand-augered rest due to utilities.
SGC-A03-000083	Sampled 25 feet from original location due to storm sewer; core sampler hit refusal at 18 inches.
SGC-A03-000087	Core sampler hit refusal at 2 feet.
SGC-A21-000088	Core sampler hit refusal at 18 inches.
SGC-A21-000090	Core sampler hit refusal at 20 inches.
SGC-SDB-000097	Relocated due to utilities.
SGC-SDB-000098	Relocated from inside a building.
SGC-SDB-000101	Relocation of SGC-SDB-000099; first location surveyed incorrectly.
SGC-SDB-000102	Relocation of SGC-SDB-000100; first location surveyed incorrectly.

Table A.1

Detected Volatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000007	SGC-NAC-000010	SGC-NAC-000011	SGC-NAC-000012	SGC-NAC-000013
PETREX SAMPLE AREA			WEST	EAST	WEST	EAST	EAST
Acetone	NA	21000000					
1,2-Dichloroethene (total)	NA	43000000					
2-Butanone	NA	93000000				8 J	10 J
Benzene	NA	8.90E+03					
Carbon Disulfide	NA	280000					4 J
Chloroform	NA	3100					
Chloromethane	NA	NA		4 J			
Ethylbenzene	NA	480					
Methylene Chloride	NA	3.95E+05		8			
Tetrachloroethene	NA	21000000					
Toluene	NA	250000			2 J		
Trichloroethene	NA	41000	7				7
Xylene (total)	NA	430000000					

No entry - not detected
J - Numerical value is an estimated quantity
C - Identification confirmed by GC/MS
mg/kg - micrograms per kilogram

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

Detected Volatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000014	SGC-NAC-000015	SGC-NAC-000016	SGC-NAC-000017	SGC-NAC-000018
PETREX SAMPLE AREA			SOUTH	SOUTH	SOUTH	SOUTH	WEST
Acetone	NA	21000000					
1,2-Dichloroethene (total)	NA	43000000		96			
2-Butanone	NA	93000000					
Benzene	NA	8.90E+03		2 J			
Carbon Disulfide	NA	280000					
Chloroform	NA	3100					
Chloromethane	NA	NA					
Ethylbenzene	NA	480		1 J			
Methylene Chloride	NA	3.95E+05			8		10
Tetrachloroethene	NA	21000000					
Toluene	NA	250000		28		2 J	
Trichloroethene	NA	41000		3 J			
Xylene (total)	NA	430000000	1 J	4 J			

No entry - not detected
J - Numerical value is an estimated quantity
C - Identification confirmed by GC/MS
mg/kg - micrograms per kilogram

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.

Detected Semivolatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000001	SGC-NAC-000002	SGC-NAC-000003	SGC-NAC-000004	SGC-NAC-000005	SGC-NAC-000006	SGC-NAC-000008
PETREX Sample Area			NORTH	NORTH	NORTH	NORTH	EAST	EAST	WEST
Acenaphthene	NA	NA		190 J	63 J				
Acenaphthylene	NA	NA		730				42 J	
Anthracene	NA	64,000,000		1300	66 J		25 J	55 J	
Benzo(a)anthracene	NA	4,100		1500	180 J		160 J	350 J	57 J
Benzo(a)pyrene	NA	410		1300	180 J		200 J	450	65 J
Benzo(b)fluoranthene	NA	4,100		1000	180 J		190 J	460	67 J
Benzo(g,h,i)perylene	NA	NA		550	110 J		100 J	260 J	26 J
Benzo(k)fluoranthene	NA	41,000		1000	160 J		190 J	440	58 J
Bis(2-ethylhexyl)phthalate	NA	215,000							
Butylbenzylphthalate	NA	43,000,000							
Carbazole	NA	NA		600	62 J			34 J	
Chrysene	NA	410,000		1500	220 J		240 J	490	68 J
Di-n-butyl phthalate	NA	21,000,000	120 J			280 J			
Di-n-octyl phthalate	NA	4,300,000							
Dibenz(a,h)anthracene	NA	410		180 J	40 J		37 J	87 J	
Dibenzofuran	NA	NA		1100	23 J				
Diethyl phthalate	NA	NA							
Fluoranthene	NA	8,500,000		3400 D	480		400 J	800	110 J
Fluorene	NA	NA		1500	42 J				
Indeno(1,2,3-cd)pyrene	NA	4,100		690	120 J		130 J	320 J	36 J
2-Methylnaphthalene	NA	NA		970					
Naphthalene	NA	NA		4000 D	24 J				
Phenanthrene	NA	NA		4700 D	380		150 J	280 J	53 J
Phenol	NA	130,000,000							
Pyrene	NA	6,400,000	24 J	2700 D	440		340 J	730	120 J

No entry - not detected
J - Value is an est. quantity
D - Sample was diluted
NA - Value not available
H - Analyzed outside holding time
µg/kg - micrograms per kilogram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

All semivolatile organic compounds detected for samples #1 through #8 are listed on this page. No semivolatile organic compounds were detected for sample location 7.

Table A.2.

Detected Semivolatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000009	SGC-NAC-000010	SGC-NAC-000011	SGC-NAC-000012	SGC-NAC-000015	SGC-NAC-000016	SGC-NAC-000017
PETREX Sample Area			EAST	EAST	WEST	EAST	SOUTH	SOUTH	SOUTH
Acenaphthene	NA	NA							
Acenaphthylene	NA	NA							
Anthracene	NA	64,000,000							
Benzo(a)anthracene	NA	4,100				18 J		47 J	
Benzo(a)pyrene	NA	410				21 J		42 J	
Benzo(b)fluoranthene	NA	4,100				22 J		39 J	
Benzo(g,h,i)perylene	NA	NA						33 J	
Benzo(k)fluoranthene	NA	41,000				17 J		46 J	
Bis(2-ethylhexyl)phthalate	NA	215,000	71 J		36 J	35 J		100 J	
Butylbenzylphthalate	NA	43,000,000							
Carbazole	NA	NA							
Chrysene	NA	410,000		20 J		22 J		51 J	
Di-n-butyl phthalate	NA	21,000,000							
Di-n-octyl phthalate	NA	4,300,000							
Dibenz(a,h)anthracene	NA	410							
Dibenzofuran	NA	NA							
Diethyl phthalate	NA	NA							
Fluoranthene	NA	8,500,000		31 J		38 J		100 J	28 J
Fluorene	NA	NA							
Indeno(1,2,3-cd)pyrene	NA	4,100						27 J	
2-Methylnaphthalene	NA	NA							
Naphthalene	NA	NA					61 J		
Phenanthrene	NA	NA						63 J	
Phenol	NA	130,000,000							
Pyrene	NA	6,400,000		31 J	20 J	37 J		87 J	26 J

No entry - not detected
J - Value is an est. quantity
D - Sample was diluted
NA - Value not available
H - Analyzed outside holding time
µg/kg - micrograms per kilogram
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.

Detected Semivolatile Organic Compounds (µg/kg)

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000018	SGC-NAC-000020	SGC-NAC-000021	SGC-NAC-000024	SGC-NAC-000027	SGC-NAC-000028	SGC-NAC-000029
PETREX Sample Area			WEST	WEST	WEST	SOUTH	SOUTH	SOUTH	SOUTH
Acenaphthene	NA	NA		21 J					
Acenaphthylene	NA	NA			44 J				
Anthracene	NA	64,000,000			130 J				
Benzo(a)anthracene	NA	4,100	48 J	130 J	110 J				
Benzo(a)pyrene	NA	410	68 J	150 J	130 J				
Benzo(b)fluoranthene	NA	4,100	59 J	67 J	88 J				
Benzo(g,h,i)perylene	NA	NA	49 J	100 J	100 J				
Benzo(k)fluoranthene	NA	41,000	62 J	37 J					
Bis(2-ethylhexyl)phthalate	NA	215,000	1000			28 J	24 J	26 J	25 J
Butylbenzylphthalate	NA	43,000,000							
Carbazole	NA	NA			21 J				
Chrysene	NA	410,000	54 J	220 J	170 J				
Di-n-butyl phthalate	NA	21,000,000							
Di-n-octyl phthalate	NA	4,300,000				89 J			
Dibenz(a,h)anthracene	NA	410	40 J	24 J	28 J				
Dibenzofuran	NA	NA							
Diethyl phthalate	NA	NA							
Fluoranthene	NA	8,500,000	84 J	180 J	320 J				
Fluorene	NA	NA			26 J				
Indeno(1,2,3-cd)pyrene	NA	4,100	53 J	46 J	73 J				
2-Methylnaphthalene	NA	NA							
Naphthalene	NA	NA							
Phenanthrene	NA	NA	27 J		220 J				
Phenol	NA	130,000,000							
Pyrene	NA	6,400,000	91 J	1400	310 J				

No entry - not detected
J - Value is an est. quantity
D - Sample was diluted
NA - Value not available
H - Analyzed outside holding time
µg/kg - micrograms per kilogram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.4.
Detected Inorganics

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000001	SGC-NAC-000002	SGC-NAC-000003	SGC-NAC-000004	SGC-NAC-000005	SGC-NAC-000006	SGC-NAC-000007	SGC-NAC-000008	SGC-NAC-000009
PETREX Sample Area			NORTH	NORTH	NORTH	NORTH	EAST	EAST	WEST	WEST	EAST
TAL INORGANICS (mg/kg)											
Aluminum	19000	NA	11000	4190	1910	11400	7970	7780	10200	2820	18700
Antimony	NA	85		0.23 B		0.24 B	0.41 B			0.27 B	0.91 B
Arsenic	8.6	64	1.5 B	2.1 B	2.9 B	1.4 B	7	7.2	1.9 B	3.2	11.1
Barium	180	15,000	48.6	20.7 B	23.7 B	47.1 B	73.6	86.4	26.2 B	23.2 B	163
Beryllium	1.3	1	0.56		0.12 B	0.65	0.38	0.28	0.28		0.9 B
Bismuth	NA	NA									0.85 B
Cadmium	2.1	210		0.25 B	0.19 B		0.36 B	0.5 B	0.33 B	0.22 B	6
Calcium	310000	NA	162000	159000	95500	152000	13600	86200	83900	113000	5940
Chromium	20	110,000	13.2	6.7	3.8	15.2	13	11.6	14.3	5.7	20.3
Cobalt	19	NA	9.8 B	4.5 B	2.3 B	10.1 B	7.6 B	7.6 B	11 B	3.3 B	13
Copper	26	NA	16.2	11.9	9.9	17.1	14.5	15.2	16.2	13.9	19.2
Cyanide	ND	4,300									
Iron	35000	NA	21300	10600	5680	21800	17200	17700	23000	7660	29400
Lead	48	NA	6.7	5.2	11.2	8.6	30.9	25.1	7.2	5.9	22.2
Lithium	26	NA	21 B	12.5 B	6.2 B	23 B	7.7 B	10.3 B	3.2 B	8.2 B	14.7 B
Magnesium	40000	NA	6160	57800	27900	5670	5210	35600	21600	47900	4500
Manganese	1400	27,000	695	384	270	612	383	589	493	256	728
Mercury	ND	64			0.13						
Molybdenum	27	NA	0.43 B	1.2 B	0.77 B		1.7 B	1.5 B	0.63 B	1.4 B	1.8 B
Nickel	32	4,300	18.4	9.9	6.4 B	20.6	11.1	16.1	22.6	8.1 B	24.5
Potassium	1900	NA	1780	742 B	346 B	2080	574 B	744 B	1590	463 B	1420
Selenium	NA	NA									
Silver	1.7	1,100			0.24 B						
Sodium	240	NA	228 B	888 B	150 B	137 B	411 B	348 B	246 B	341 B	1010 B
Thallium	0.46	NA									
Tin	20	NA	1.1 B			1.4 B	1 B			4.5 B	1.5 B
Vanadium	25	1,500	14.9	8.3	4.7	16.3	23.1	18.9	14.2	7.4	42.7
Zinc	140	64,000	53.3	29.5		67	59	69.2	53.8	36.6	71.8
OTHER INORGANICS											
% Solids (%)	NA	NA	83.9	93.8	88.5	83.3	78.4	75	83.9	95	78.9
Nitrate/Nitrite (mg-N/kg)	NA	NA	2	1.8	1.2	2.1	7.2	4.8	1.6	26.5	2.2

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.4.
Detected Inorganics

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000010	SGC-NAC-000011	SGC-NAC-000012	SGC-NAC-000013	SGC-NAC-000014	SGC-NAC-000015	SGC-NAC-000016	SGC-NAC-000017
PETREX Sample Area			EAST	WEST	EAST	EAST	SOUTH	SOUTH	SOUTH	SOUTH
TAL INORGANICS (mg/kg)										
Aluminum	19000	NA	7300	10300	13100	8460	17700	7370	14100	20000
Antimony	NA	85	0.21 B	1.2 B						
Arsenic	8.6	64	7.2	2.2 B	1.9 BJ	1.2 BJ	2.7	3.6 J	3.4	2.4 B
Barium	180	15,000	64.7	13.5 B	78.4	53.4	110	51.3 B	68.7	119
Beryllium	1.3	1	0.34	0.36 B	0.44	0.2 B	0.68	0.24 B	0.46	0.96
Bismuth	NA	NA		0.99 B					0.82 B	1.2 B
Cadmium	2.1	210	0.62 B	5.2	6	4.6	7.7	3.7	5.7	8.6
Calcium	310000	NA	41500	90800	127000 J	222000 J	94200	342000	133690	23800
Chromium	20	110,000	12	11.9	17.3	10.8	22.3	9.1	17.7	24.5
Cobalt	19	NA	7.9 B	13.7	12.7 J	7.5 BJ	13.9	5.8 B	11.6 B	18.5
Copper	26	NA	17.4	16.6	21.3 J	13.5 J	22.4	12.2	19.3	26.9
Cyanide	ND	4,300					1.8		1	
Iron	35000	NA	17300	25600	27900	21100	36300	16600	26600	40000
Lead	48	NA	16.5	5.7	9.3 J	29.4 J	12.9	14.3	14.1	27.5
Lithium	26	NA	9.2 B	27.3	25.3	17.8 B	30.7	15 B	25.1	34.1
Magnesium	40000	NA	16700	12300	19900 J	7250 J	8190	4760	14600	6250
Manganese	1400	27,000	604	908	658	543	939	689	641	1360
Mercury	ND	64								0.07 B
Molybdenum	27	NA	2.3 B	0.58 B	1.3 B	0.81 B	1.3 B	0.51 B	1.3 B	0.76 B
Nickel	32	4,300	16.5	21.6	26.4	17.6	31.4	13.8	23.9	34.4
Potassium	1900	NA	794 B	2210 B	1630	1100 B	2250 B	1010 B	2090 B	3680
Selenium	NA	NA		0.31 B						
Silver	1.7	1,100								
Sodium	240	NA	82 B	288 B	2490 J	328 BJ	142 B	248 B	398 B	209 B
Thallium	0.46	NA								
Tin	20	NA			1.6 B	1.1 B	0.98 B		1.7 B	3.3 B
Vanadium	25	1,500	19.2	15.8	22.4	12.9	29.4	10.7	23.8	30.2
Zinc	140	64,000	299	59.9	68.5	44.9	92.5	67.7	70.5	103
OTHER INORGANICS										
% Solids (%)	NA	NA	83.9	90.1	84.7	81.7	80.9	74	85.3	72.8
Nitrate/Nitrite (mg-N/kg)	NA	NA	5.9	5.3	1.8	2.1	4.9	3	2.4	6.4

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.4.
Detected Inorganics

ANALYTE	Background Value	Industrial Scenario Guideline Criteria	SGC-NAC-000018	SGC-NAC-000019	SGC-NAC-000020	SGC-NAC-000021	SGC-NAC-000022	SGC-NAC-000023	SGC-NAC-000024	SGC-NAC-000025
PETREX Sample Area			WEST	WEST	WEST	WEST	WEST	SOUTH	SOUTH	SOUTH
TAL INORGANICS (mg/kg)										
Aluminum	19000	NA	5130	7820	13400	7720	8030	12200	5410	6830
Antimony	NA	85					0.66 B			
Arsenic	8.6	64	4.1	6.8	3	4.3	13.3	2 BJ	0.83 BJ	1.9 BJ
Barium	180	15,000	21.4 B	56.1	17.9 B	24.2 B	65.8 J	90.3	28.4 B	49.2
Beryllium	1.3	1	0.28	0.22 B	0.77	0.19 B	0.49	0.91	0.29	0.4
Bismuth	NA	NA								
Cadmium	2.1	210		3.4						
Calcium	310000	NA	157000	76400	64400	58300	42200	35400 J	210000 J	162000 J
Chromium	20	110,000	9.3	8.9	18.6	13.9	14.4 J	16.2	7.9	18.1
Cobalt	19	NA	5.5 B	8.4 B	12.9	10.3 B	11.5 B	13.1	5.9 B	8.7 B
Copper	26	NA	11.6	14.2	17.3	26.5	26.3 J	18.9	8.2	30.5
Cyanide	ND	4,300				0.65 B				
Iron	35000	NA	13600	16000	25500	20600	22300 J	29300	14600	24200
Lead	48	NA	8.2	14.2	5.3	14	14.9 J	16.4 J	5.2 J	6.9 J
Lithium	26	NA	18.1 B	9.7 B	39.5	25.8	15.3 B	18.8 B	12.8 B	16.3 B
Magnesium	40000	NA	47700	29800	16300	15800	22000 J	4640	15700	14900
Manganese	1400	27,000	381	539	505	577	522 J	1030 J	393 J	429 J
Mercury	ND	64						0.07 BJ		
Molybdenum	27	NA	0.82 B	2.2 B		0.53 B	5.7	0.87 B	0.63 B	2.3 B
Nickel	32	4,300	13.5	13.3	27.3	21.3	27.4	42.3	12.3	22.2
Potassium	1900	NA	1040 B	1090 B	3590	1300	641 B	1760	874 B	443 B
Selenium	NA	NA								
Silver	1.7	1,100	0.41 B			0.33 B				
Sodium	240	NA	398 B	155 B	383 B	357 B	101 BJ	174 BJ	172 BJ	157 BJ
Thallium	0.46	NA								
Tin	20	NA		1.3 B	1.6 B	1.7 B	1 B	0.97 B		0.89 B
Vanadium	25	1,500	10.3	17.5	17.7	12.6 B	22.4 J	18	7.3	10.5
Zinc	140	64,000	41.2	56.1	84.9	68.9	72.5 J	66.6	28.9	64.6
OTHER INORGANICS										
% Solids (%)	NA	NA	84.2	85.3	87.6	77.4	78.3	77.5	89.5	89.3
Nitrate/Nitrite (mg-N/kg)	NA	NA	13.7	6.5	2.1	6.1	2.2	11.6	2.2	2

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.5.

Detected Radionuclides (pCi/g)

ANALYTE	Background	Industrial Scenario Guideline Criteria	SGC-NAC-000006	SGC-NAC-000007	SGC-NAC-000008	SGC-NAC-000009	SGC-NAC-000010
PETREX Sample Area			EAST	WEST	WEST	EAST	EAST
Americium-241	ND	4.95					
Bismuth-207	ND	0.18					
Bismuth-210	ND	NA					
Cesium-137	0.42	0.46	0.861				
Cobalt-60	NC	0.10					
Plutonium-238	0.13	5.5	4.32	0.537	0.0826	0.0233	0.107
Plutonium-239/240	0.18	5.5					
Potassium-40	37	NA	14.3	10.8	7.72	12.9	15
Radium-226+D	2	0.14	0.87	0.537	0.571	0.764	0.917
Thorium-228+D	1.5	0.85	1.06	0.431	0.678	0.779	0.914
Thorium-230	1.9	44	1.18	0.582	0.541	1.09	1.27
Thorium-232	1.4	50	1.18	0.328	0.554	0.838	0.708
Uranium-234	1.1	38	0.761	0.551	0.361	0.712	0.897
Uranium-235+D	0.11	3.4					0.0459
Uranium-238+D	1.2	11.0	0.815	0.574	0.414	0.774	1.06

No entry - not detected
ND -No detections in background samples
NA - Data not available
NC - Background value not computed
pCi/g - picocuries per gram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.5.

Detected Radionuclides (pCi/g)

ANALYTE	Background	Industrial Scenario Guideline Criteria	SGC-NAC-000011	SGC-NAC-000012	SGC-NAC-000013	SGC-NAC-000014	SGC-NAC-000015
PETREX Sample Area			WEST	EAST	EAST	SOUTH	SOUTH
Americium-241	ND	4.95					
Bismuth-207	ND	0.18					
Bismuth-210	ND	NA					
Cesium-137	0.42	0.46				0.826	
Cobalt-60	NC	0.10					
Plutonium-238	0.13	5.5	0.0718	0.101	0.0107	0.671	0.0118
Plutonium-239/240	0.18	5.5		0.00154		0.0206	
Potassium-40	37	NA	17.8	15.5	4.65	22.5	19.2
Radium-226+D	2	0.14	0.778	0.592	0.263	1.1	1.4
Thorium-228+D	1.5	0.85	0.913	0.697	0.247	1.18	1.37
Thorium-230	1.9	44	0.902	0.803	0.359	1.09	1.48
Thorium-232	1.4	50	0.83	0.769	0.21	1.08	1.43
Uranium-234	1.1	38	0.882	0.693	0.378	0.866	1.01
Uranium-235+D	0.11	3.4		0.0231	0.0183	0.0548	0.0927
Uranium-238+D	1.2	11.0	0.871	0.681	0.424	1.01	0.955

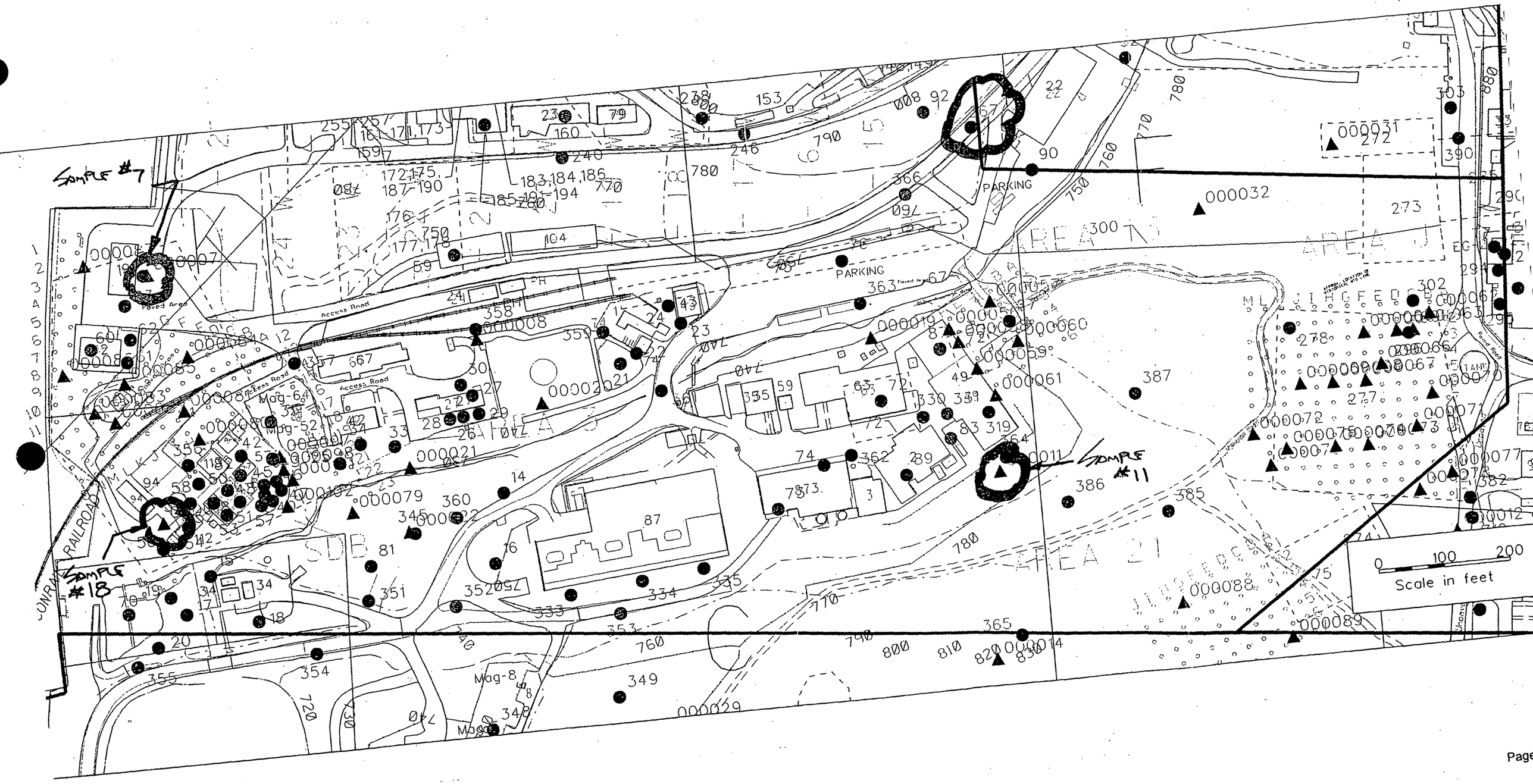
No entry - not detected
ND -No detections in background samples
NA - Data not available
NC - Background value not computed
pCi/g - picocuries per gram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)

Table A.5.

Detected Radionuclides (pCi/g)

ANALYTE	Background	Industrial Scenario Guideline Criteria	SGC-NAC-000016	SGC-NAC-000017	SGC-NAC-000018	SGC-NAC-000019	SGC-NAC-000020
PETREX Sample Area			SOUTH	SOUTH	WEST	WEST	WEST
Americium-241	ND	4.95					
Bismuth-207	ND	0.18					
Bismuth-210	ND	NA					
Cesium-137	0.42	0.46		0.582			
Cobalt-60	NC	0.10					
Plutonium-238	0.13	5.5	0.253	0.2	0.684	0.121	0.721
Plutonium-239/240	0.18	5.5	0.00413	0.0166	0.00487		
Potassium-40	37	NA	15.2	29.1	10.1	7.9	24.7
Radium-226+D	2	0.14	0.934	0.96	0.677	0.528	0.841
Thorium-228+D	1.5	0.85	1.04	1.1	0.465	0.378	0.892
Thorium-230	1.9	44	1.36	1.01	0.582	0.749	1.08
Thorium-232	1.4	50	0.894	1.26	0.508	0.375	0.843
Uranium-234	1.1	38	0.765	0.698	0.523	0.44	0.751
Uranium-235+D	0.11	3.4	0.0394	0.0403			0.0362
Uranium-238+D	1.2	11.0	0.993	0.852	0.496	0.691	0.825

No entry - not detected
ND -No detections in background samples
NA - Data not available
NC - Background value not computed
pCi/g - picocuries per gram
Red = above Guideline Criteria (GC)
Green = above GC and below Background
Magenta = above Background and Below GC
Blue = above Background (no GC)


Sample #7
Sample #11
Sample #18
PARKING
PARKING
Access Road
Paved Area
Mag-64
Mag-52
Mag-8
AREA 21
0 100 200
Scale in feet