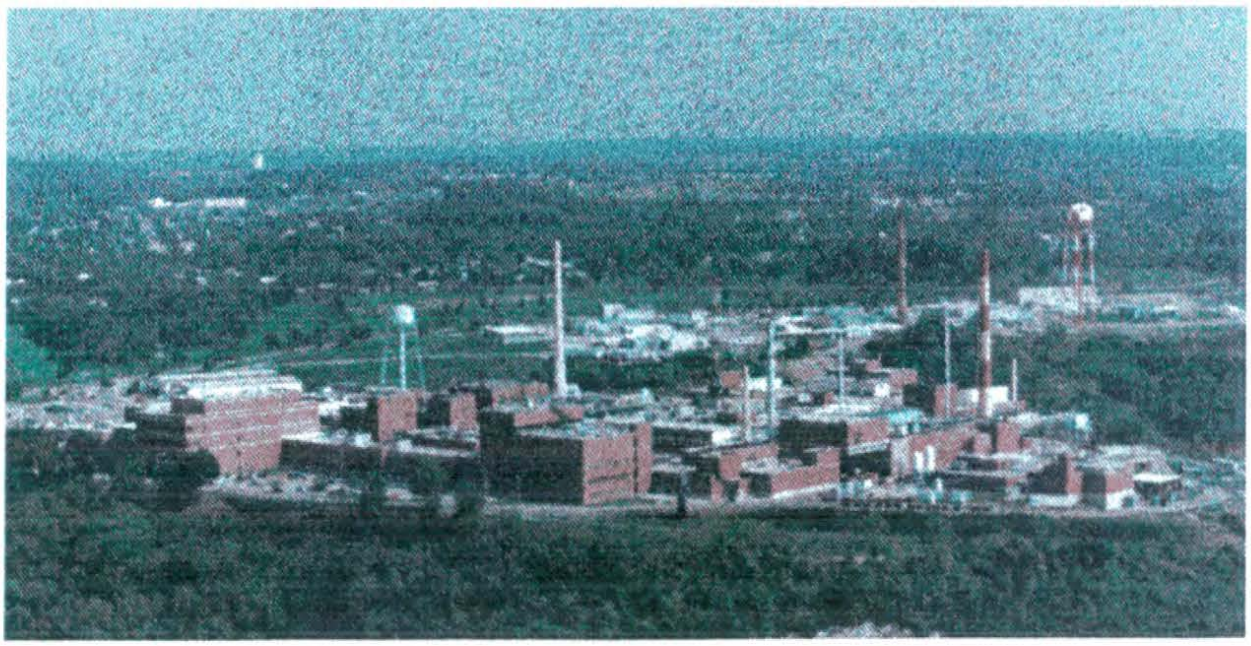
EG&G MOUND-30-03-04-02--9702110052

MOUND

Environmental
Restoration
Program

MOUND PLANT
(Western Sector)
Potential Release Site Package
PRS # 351/352/353/357/359/360/361/362/385/386/387



MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PACKAGE

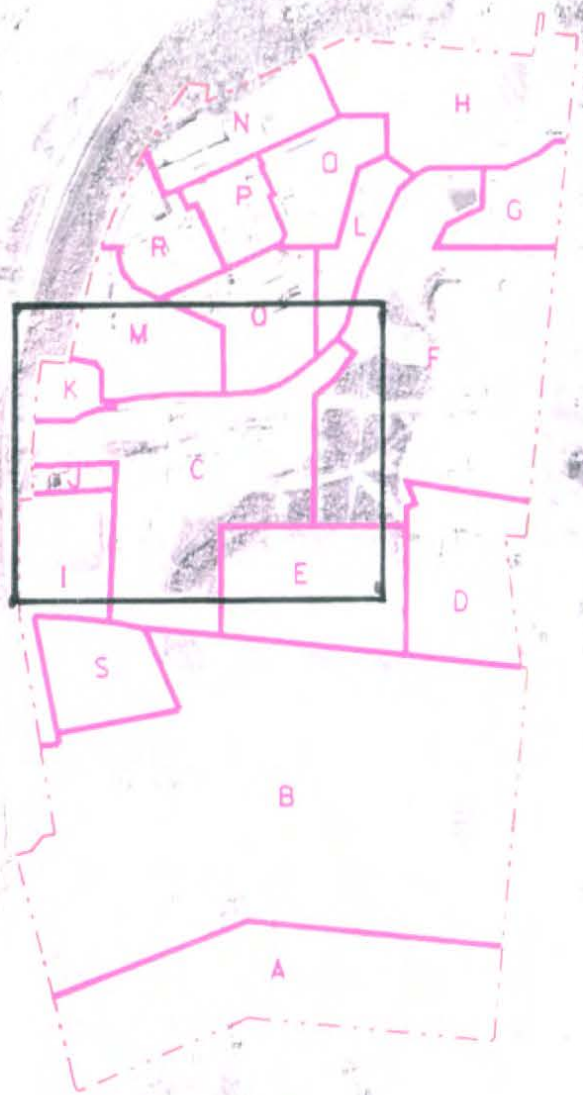
Notice of Public Review Period

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 December 19, 1996. Public comment will be accepted on these packages from December 19, 1996, through January 23, 1997.

PRS 346/347/348/355/370, 351/352/353/357/359/360/361/362/385/386/387, 364, 369, 384, 388, 389/392

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

REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comment.	Dec. 19, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Jan. 28, 1997



MOUND PLANT
(Western Quadrant)
Release Block C/F
Potential Release Site

PRS 351/352/353/357/359/
360/361/362/385/386/387

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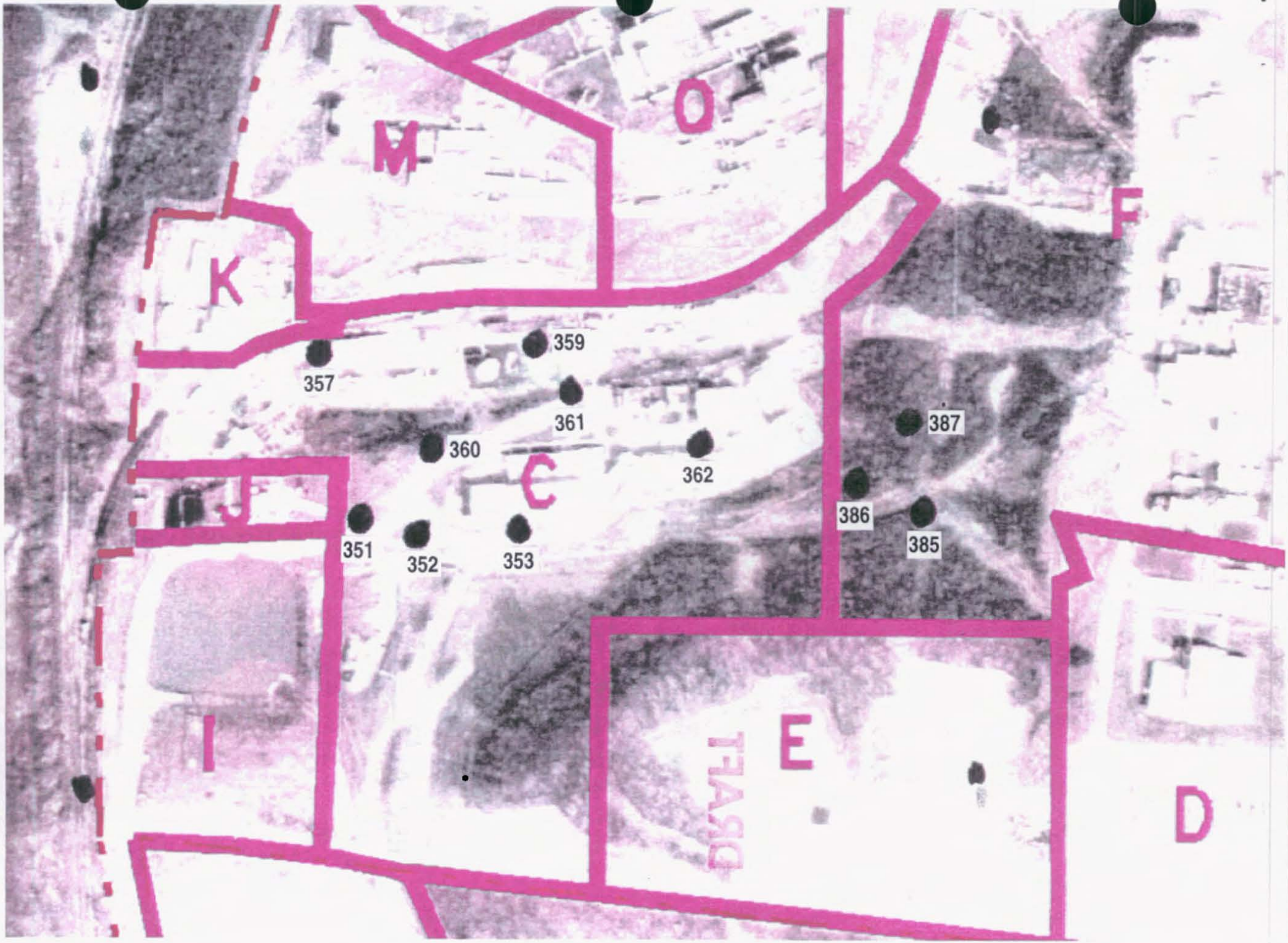
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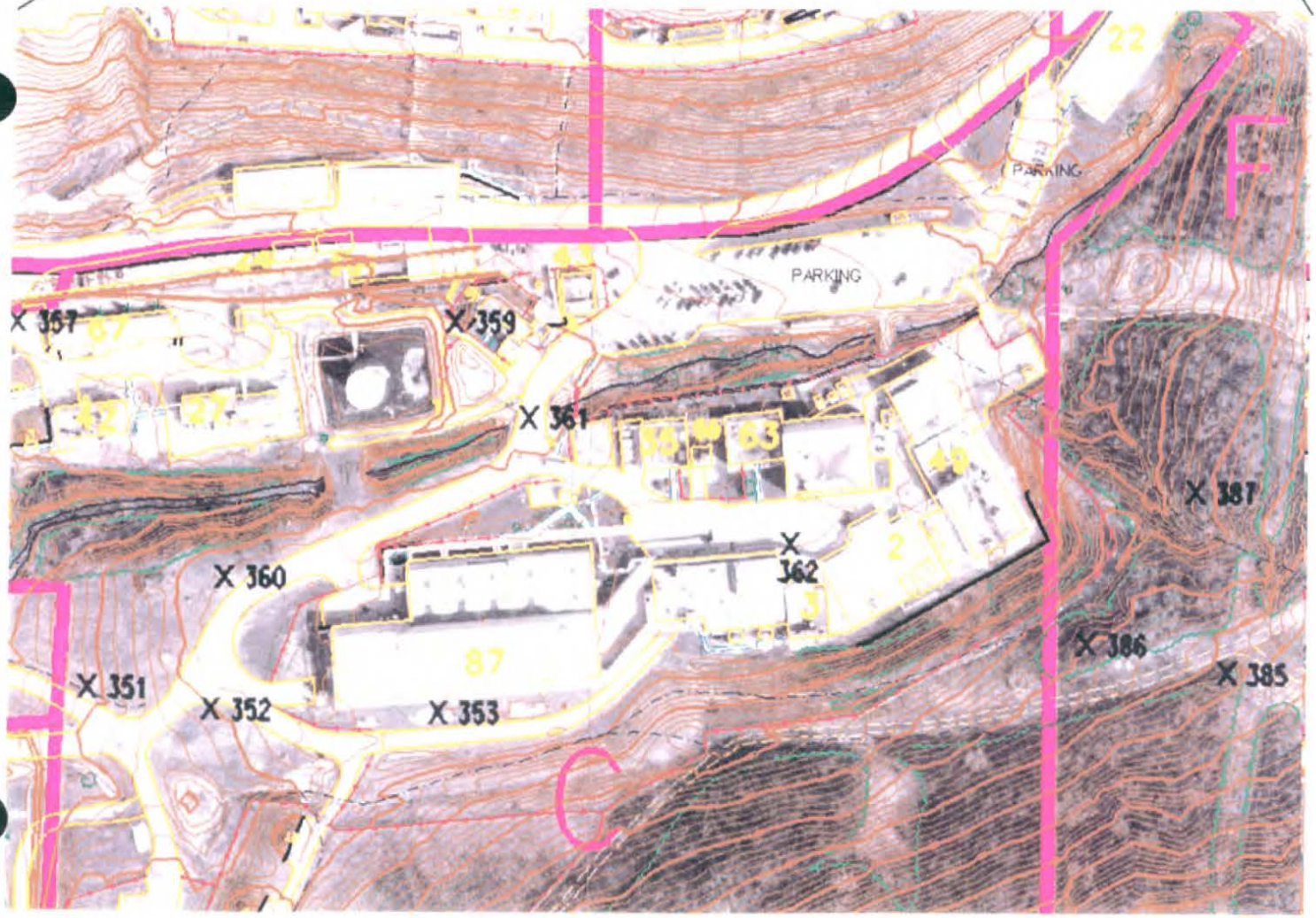
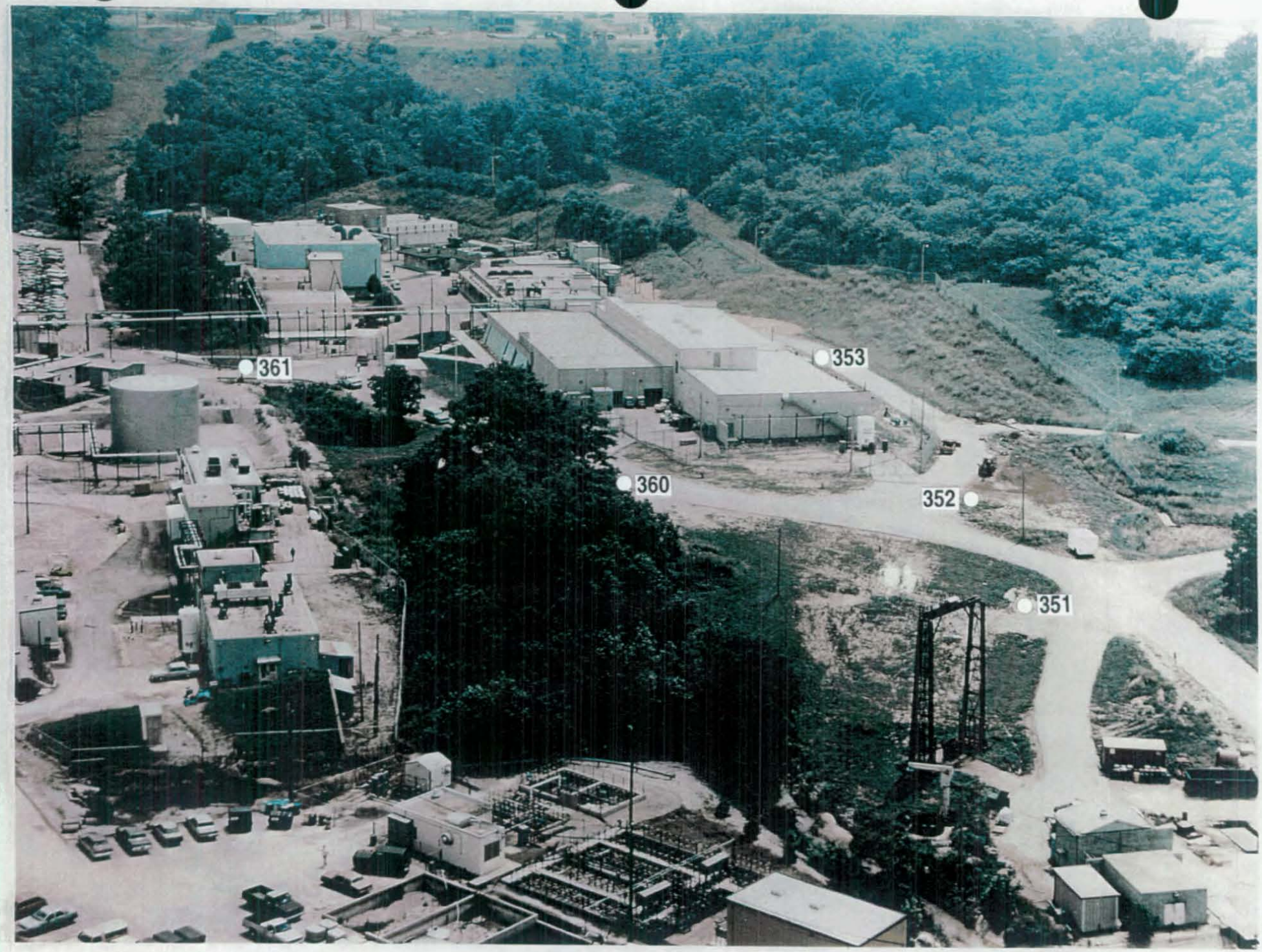
MOUND PLANT
(Western Quadrant)

Release Block C/F

Potential Release Site

PRS 351/352/353/357/359/
360/361/362/385/386/387

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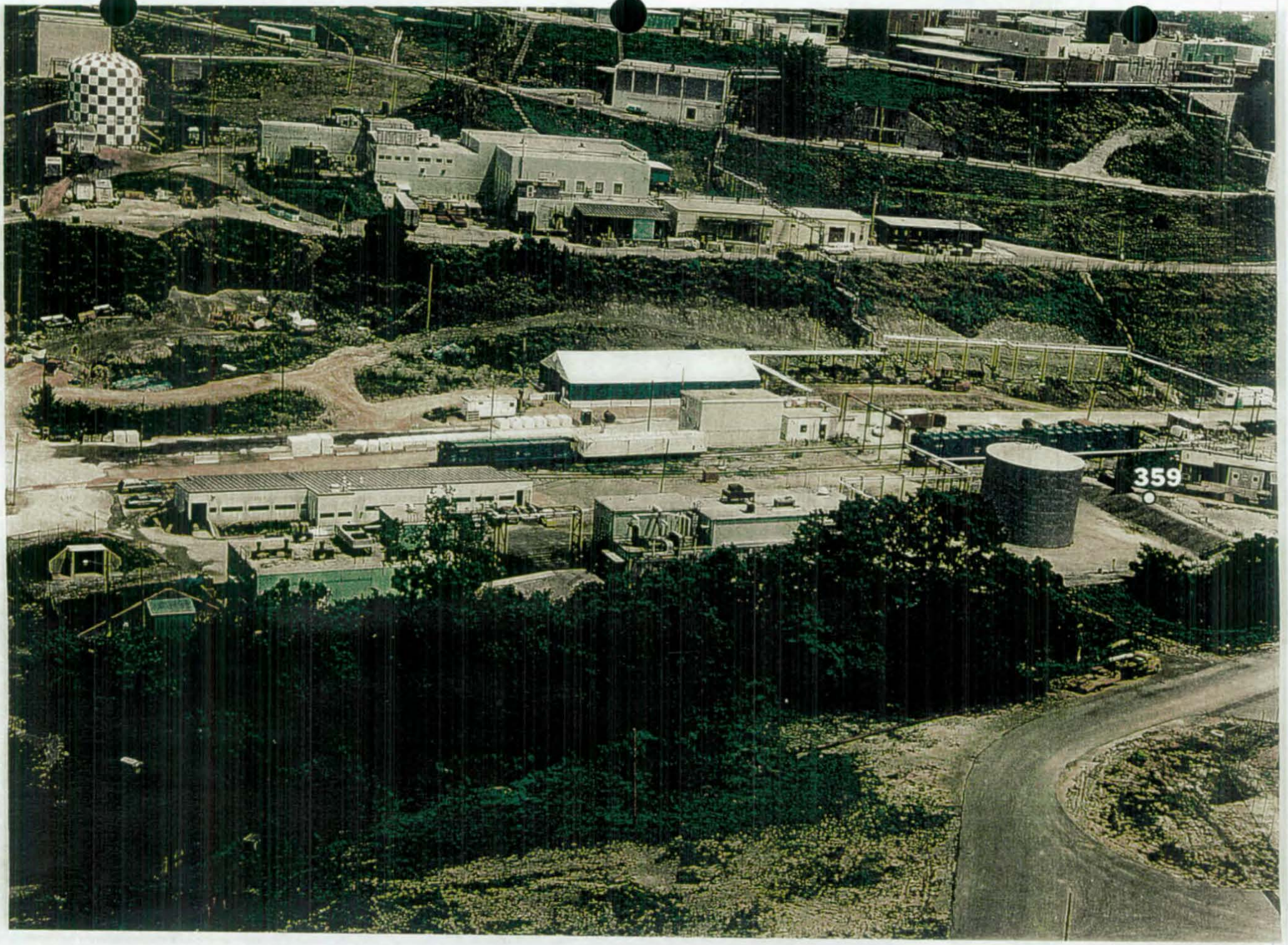
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PRS
351/352/353/357/359/360/361/362/385/386/387

PRS HISTORY:

Potential Release Sites (PRSs) 351, 352, 353, 357, 359, 360, 361, 362, 385, 386 and 387 are soils sites located in the western sector of the original Mound plant (see map on page 9 or 30.1). These soils locations were identified as PRSs due to qualitative hydrocarbon detections found during the PETREX soil gas portion of the ***OU5, Non Area of Concern*** investigation.

CONTAMINATION:

1. In 1983, the ***Radiological Site Survey***[1] investigated radionuclides in the soils at the Mound site via Mound Soil Screening, radiochemistry, and gamma spectroscopy. The map on page 9 shows the location of PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386 and 387 in relation to the Radiological Site Survey samples. Results showed:

PRS	Samples within 50 ft of the PRS	Maximum Concentration Measured	Guideline Criteria
351	1 surface sample S0522 / 25 ft SE	Plutonium-238 at 0.05 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
352	1 surface sample S0521 / 40 ft NW 1 surface sample S0525 / 30 ft East	Plutonium-238 at 2 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
353	None	Not Applicable	Not Applicable
357	1 surface sample S0491 / 50 ft NE	Plutonium-238 at 5.3 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
359	1 surface sample S0502 / 30 ft South 1 surface sample S0503 / 50 ft SW	Plutonium-238 at 2 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
360	1 surface sample S0519 / 50 ft SW	Plutonium-238 at 7.3 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
361	None	Not Applicable	Not Applicable
362	1 surface sample S0683 / 40 ft NW 1 surface sample S0674 / 30 ft East	Plutonium-238 at 0.5 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
385	1 surface sample S0732 / 50 ft SW 2 core samples C0172 / 40 ft East	Plutonium-238 at 0.5 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]
386	None	Not Applicable	Not Applicable
387	1 surface sample S0618 / 30 ft North 1 surface sample S0620 / 25 ft SE	Plutonium-238 at 0.5 pCi/g Thorium at less than 2 pCi/g	Plutonium = 25 pCi/g (Mound ALARA) Thorium = 5 pCi/g [ref 4]

2. In 1994, the ***OU5, Operational Area Phase I Investigation***[2] analyzed the Mound site for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) via a qualitative PETREX soil gas survey. The OU5 investigation also analyzed surface soil for radiological contamination via Mound FIDLER (field instrument for detecting low energy radiation) and Mound soil screening. Results showed:

PRS	PETREX Qualitative Results	Radiological Screened Sample
351	Relatively high semivolatile, aromatic and petroleum hydrocarbons	22 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0.8 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])
352	Relatively high semivolatile, aromatic and petroleum hydrocarbons	Less than 20 disintegrations per minute
353	Relatively high aromatic and petroleum hydrocarbons	0 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])
357	Relatively high petroleum hydrocarbons	Less than 20 disintegrations per minute
359	Relatively high aromatic and petroleum hydrocarbons	19 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0.5 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])
360	Relatively high halogenated hydrocarbons	No results available
361	Relatively high semivolatile, aromatic and petroleum hydrocarbons	Less than 20 disintegration's per minute
362	Relatively high aromatic and petroleum hydrocarbons	0 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0.6 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])
385	Relatively high aromatic, petroleum and halogenated hydrocarbons	8 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0.9 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])
386	Relatively high petroleum and halogenated hydrocarbons	18 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 1.2 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])
387	Relatively high aromatic, petroleum and halogenated hydrocarbons	25 pCi/g plutonium-238 (ALARA guideline = 25 pCi/g) 0.5 pCi/g thorium-232 (guideline = 5 pCi/g [ref 4])

3. In 1996, the ***Soil Gas Confirmation Sampling***[5] investigation 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.

PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386 and 387 were not sampled but had lower western sector 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 western sector (sample #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. PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386 and 387). The map on page 30.1 shows the PRSs 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 these results to the qualitative PETREX ion counts for PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386 and 387.

PETREX Soil Gas Contaminant Family	Maximum Ion Counts[2]	Confirm Sample #	Confirmation Sample Results that Exceed Guideline Criteria (GC)	Ion Counts at PRSs	
Total Aromatic Hydrocarbons	21,843,639	(#18)	None	4,057,383	PRS 351
				2,087,712	PRS 352
				2,994,722	PRS353
				1,973,408	PRS 357
				8,682,028	PRS 359
				519,683	PRS 360
				2,670,853	PRS 361
				12,436,663	PRS 362
				4,463,226	PRS 385
				1,595,598	PRS 386
				3,302,976	PRS 387
Total Semivolatile Hydrocarbons	1,389,465	(#18)	None	579,124	PRS 351
				208,961	PRS 352
				617	PRS353
				23,694	PRS 357
				859	PRS 359
				19,490	PRS 360
				642,824	PRS 361
				10,089	PRS 362
				661	PRS 385
				1777	PRS 386
				1383	PRS 387
Total C5-C11 Petroleum Hydrocarbons	30,786,838	(#7)	None	9,891,577	PRS 351
				4,036,897	PRS 352
				3,566,067	PRS353
				3,044,283	PRS 357
				15,211,532	PRS 359
				71,907	PRS 360
				7,889,389	PRS 361
				20,643,468	PRS 362
				8,718,631	PRS 385
				4,935,736	PRS 386
				6,947,527	PRS 387
Total Halogenated Hydrocarbons	892,683	(#11)	None	Not detected	PRS 351
				No data	PRS 352
				Not detected	PRS353
				Not detected	PRS 357
				Not detected	PRS 359
				334,370	PRS 360
				No data	PRS 361
				6,304	PRS 362
				64,329	PRS 385
				76,118	PRS 386
				62,601	PRS 387

The correlations made above make no conclusions about individual contaminant concentrations at PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386 and 387 only that the overall health risk at PRSs 351, 352, 353, 356, 357, 359, 360, 361, 362, 385, 386 and 387 is expected to be similar to or less than that of the PETREX locations with the highest measured ion counts.

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993. (pages 8-16)
2) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Volumes I and II, Final (Revision 0), June 1995. (pages 17-26)
3) Risk Based Guideline Values, Final, (Revision 0), December 1995.

OTHER REFERENCES:

4) Code of Federal Regulations, 40 CFR 192.41 and 40 CFR 192.12.
5) Soil Gas Confirmation Sampling, (Revision 0), May 1996. (pages 27-42)

PREPARED BY:

George Liebson, Member of EG&G Technical Staff

MOUND PLANT
PRS 351/352/353/357/359/360/361/362/385/386/387
SOIL CONTAMINATION

RECOMMENDATION:

PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386, and 387 are located in the western sector of the original Mound plant. These soil locations were identified as PRSs 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 these PRSs.

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. PRSs 351, 352, 353, 357, 359, 360, 361, 362, 385, 386, and 387 were not sampled as part of the *Soil Gas Confirmation Sampling* but the PRSs had lower ion counts than confirmation sample locations 7, 11, and 18. This implies that these PRSs will have similar or lower health risk.

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

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath 11/20/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 11/20/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 11/26/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 12/19/96 to 1/23/97

☒ No comments were received during the comment period.

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

Page R

REFERENCE MATERIAL
PRS 351/352/353/357/359/360/361/362/385/386/387

Document Control No. DGC

Environmental Restoration Program

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

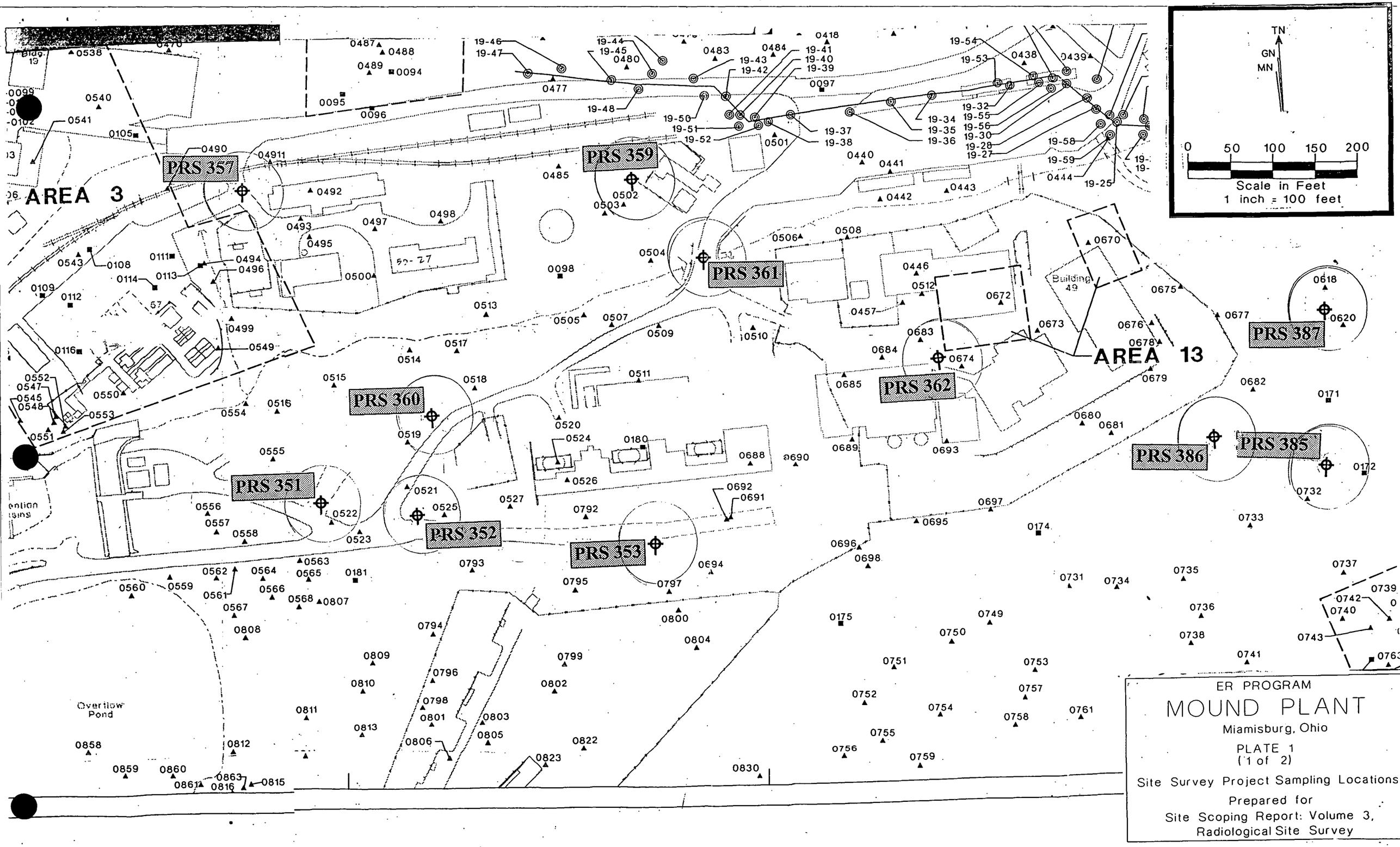
MOUND PLANT
MIAMISBURG, OHIO

June 1993

FINAL

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies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Scale in Feet
1 inch = 100 feet
AREA 3
AREA 13
PRS 357
PRS 359
PRS 361
PRS 360
PRS 362
PRS 351
PRS 352
PRS 353
PRS 387
PRS 386
PRS 385
Overflow Pond
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

PRS 352 →

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)
S0525	2675	4010	5891	07-84	0	0.59[c]	b					
S0526	2700	3860	2687	09-83	0	4.46	b					
S0527	2700	3935	5890	07-84	0	0.20	b					
S0528	1875	4165	7165	09-84	0	0.27	b					
S0529	1875	4190	7166	09-84	0	0.51	b					
S0530	1900	4225	10497	08-85	0	0.41	b					
S0531	1900	4265	2862	10-83	0	1.27	b					
S0532	1905	4215	10498	08-85	0	0.48	b					
S0533	1905	4220	10496	08-85	0	1.84	b					
S0534	1910	4225	10495	08-85	0	1.13	b					
S0535	1920	4230	10494	08-85	0	0.51	b					
S0536	1950	4290	7167	09-84	0	2.20	b					
S0537	1950	4315	2683	10-83	0	0.17	b					
C0099	1965	4265	10419	08-85	18	31.40	b					
			10420	08-85	36	14.70	b					
S0538	1975	4165	7165	09-84	-							

[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.

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)
S0508	2575	3430	5882	07-84	0	2.83[c]	b					
S0509	2575	3680	5885	07-84	0	2.24	b					
S0510	2625	3580	2990	10-83	0	0.13[c]	b	0.19				
S0511	2625	3730	2991	10-83	0	0.89	b	1.52				
S0512	2675	3380	2988	10-83	0	0.03	b					
S0457	2675	3405	2989	10-83	0	0.25[c]	b					
C0098	2470	3760	7755	10-84	90	0.16	b					
			7756	10-84	180	0.02	b					
S0513	2475	3860	5888	07-84	0	4.57	b					
S0514	2475	3960	5896	07-84	0	0.17	b					
S0515	2475	4060	5895	07-84	0	0.26	b					
S0516	2475	4135	5894	07-84	0	1.31	b					
S0517	2500	3910	5897	07-84	0	1.43	b					
S0518	2550	3910	5898	07-84	0	1.12	b					
PRS 360 → S0519	2575	4010	2689	09-83	0	7.28[c]	b					
S0520	2625	3835	2688	09-83	0	0.03	b					
PRS 352 → S0521	2625	4035	5893	07-84	0	1.71	b					
PRS 351 → S0522	2625	4135	2690	09-83	0	0.05	b					
S052:												
S0524												
E-48												

[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.
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Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
PRS 357 → S0491	2200	4010	2917	10-83	0	5.26	b					
S0492	2250	3985	6872	08-84	0	0.02	b					
S0493	2275	4010	6870	08-84	0	0.03	b					
S0494	2275	4135	6874	08-74	0	1.48	b					
(The collection date of 08-74 should probably be either 08-84 or 07-84)												
S0495	2300	4010	2920	10-83	0	0.03	b					
S0496	2300	4135	6873	08-84	0	0.02	b					
S0497	2325	3935	6871	08-84	0	0.04	b					
S0498	2350	3860	2922	10-83	0	0.10	b					
S0499	2350	4135	2919	10-83	0	0.04[c]	b					
S0500	2375	3960	2921	10-83	0	0.54	b					
C0097	2400	3380	8278	10-84	72	0.46	b		LDL	LDL	1	LDL
S0501	2425	3455	2994	10-83	0	2.91	b					
PRS 359 → S0502	2425	3655	2993	10-83	0	2.32	b					
PRS 359 → S0503	2425	3680	2992	10-83	0	0.13	b					

[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.

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)
C0169	3575	2720	2473	08-83	18	0.07	b					
			2474	08-83	36	0.03	b					
			2475	08-83	54	0.21	b					
S0667	3575	2770	5830	07-84	0	0.38	b					
S0668	3575	2870	5831	07-84	0	0.02	b					
			2837	10-83	0	0.02	b					
C0170	2700	3000	8264	10-84	72	0.24	b					
			8264	10-84	162	0.03	b					
(The same MRC ID was given for both depths.)												
S0670	2705	3175	4029	10-83	0	0.34	b					
S0671	2725	3075	4118	10-83	0	5.74	b					
S0672	2725	3300	4027	10-83	0	0.43	b					
S0673	2775	3275	4043	10-83	0	0.08	b	0.15				
PR5 362 → S0674	2775	3375	4028	10-83	0	0.54	b					
S0675	2800	3100	7196	09-84	0	0.28	b					
S0676	2825	3150	7193	09-84	0	0.09	b					
S0677	2850	3075	7197	09-84	0	0.11	b					

[a]C denotes core location and S denotes surface sample location on Plate 1.
[b]Thorium results of $\leq$ 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.
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Map Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
S0682	2950	3075	7198	09-84	0	0.07	b		LDL	LDL	1.1	LDL
PRS 362 → S0683	2725	3405	4036	10-83	0	0.30	b					
S0684	2725	3455	7115	09-84	0	0.04	b					
S0685	2725	3505	4035	10-83	0	0.60	b					
S0686	2750	2580	7116	09-84	0	0.06	b					
S0689	2775	2580	7118	09-84	0	0.25	b					
S0688	2775	3655	4034	10-83	0	0.40	b					
S0689	2800	3530	7119	09-84	0	0.21	b					
S0690	2800	3605	7117	09-84	0	0.73	b					
S0691	2825	3705	7122	09-84	0	1.03	b					
S0692	2825	3710	7123	09-84	0	2.51	b		LDL	1.3	0.9	LDL
S0693	2850	3430	4037	10-83	0	0.96[c]	b	0.40				
S0694	2875	3755	4033	10-83	0	0.40	b	0.38				
S0695	2925	3505	7120	09-84	0	0.11	b					
S0696	2925	3580	7121	09-84	0	0.78	b					

[a]C denotes core location and S denotes surface sample location on Plate 1.
[b]Thorium results of $\leq$ 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.

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)
S0720	3560	4015	10463	08-85	0	25.00	b					
S0721	3565	4010	10462	08-85	0	20.40	b					
S0722	3570	4000	10461	08-85	0	28.30	10.20					
S0723	3575	3785	5848	07-84	0	0.24	b					
S0724	3575	3860	5858	07-84	0	88.40[c]	4.03[c]					
S0725	3575	3990	10460	08-85	0	119.00	8.50					
S0726	3580	3980	10459	08-85	0	163.00	32.60					
S0727	3583	3975	10458	08-85	0	36.80	6.10					
S0728	3585	3970	10457	08-85	0	116.00	20.40					
S0729	3590	3960	10456	08-85	0	45.90	b					
S0730	3595	3950	10455	08-85	0	15.50	b					
C0171	3000	3000	8276	10-84	42	0.10	b					
			8277	10-84	102	0.02	b					
S0731	3075	3375	7328	09-84	0	0.34	b					
PRS 385 → C0172	3100	3000	8288	10-84	72	0.04	b					
			8289	10-84	120	0.15	b					
PRS 385 → S0732	3100	3075	7330	09-84	0	0.47	b					

[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]Gamma 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.

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)

[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.

C0147	2700	2620	8270	10-83	72	0.10	b					
			8271	10-83	162	0.01	b					
S0609	2750	2845	4115	10-83	0	0.14	b					
S0610	2800	2645	8656	12-84	0	6.09	b					
S0611	2800	2745	8658	12-84	0	0.65	b					
S0612	2800	2920	8664	12-84	0	0.28	b					
S0613	2825	2870	8655	12-84	0	2.97	b					
S0614	2825	2945	8663	12-84	0	1.10	b					
S0615	2875	2670	8657	12-84	0	1.85	b					
S0616	2875	2845	8661	12-84	0	1.69	b					
S0617	2875	2720	8659	12-84	0	0.68	b					
PRS 1 387 → S0618	2875	2945	4116	10-83	0	6.42	b					
S0619	2925	2820	8660	12-84	0	0.15	b					
PRS 7 387 → S0620	2925	2945	8663	12-84	0	1.10	b					
S0621	2950	2645	4113	10-83	0	3.35	b					
S0622	3025	2590	4126	10-83	0	17.40	b					

Document Control No. _____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

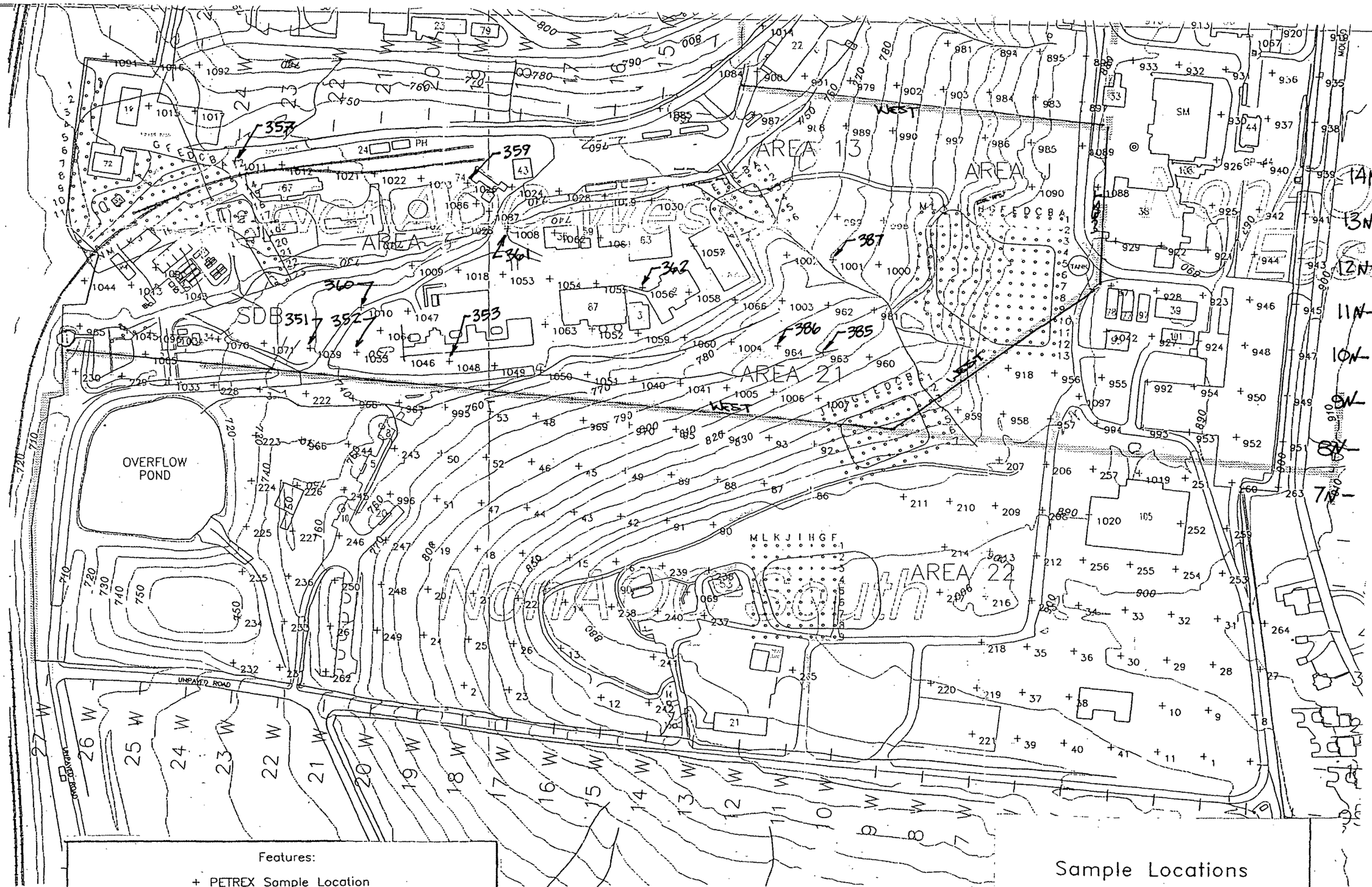
VOLUME II - APPENDICES A-G

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies



Features:

+ PETREX Sample Location

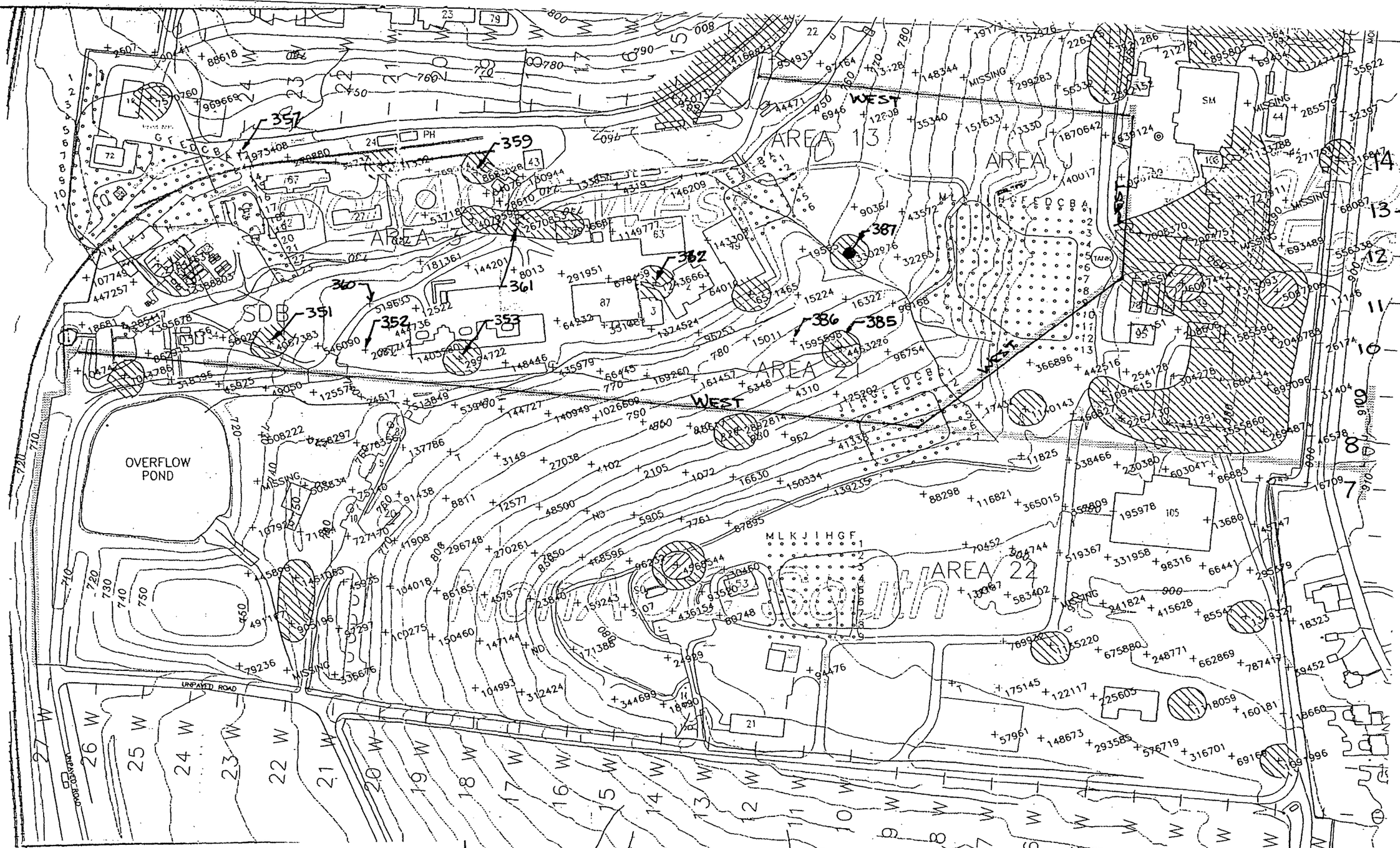
ND Not Detected

H Denotes interference by petroleum hydrocarbons; see text.

Sample Locations

Plate 1

Drawn By: | Project #:

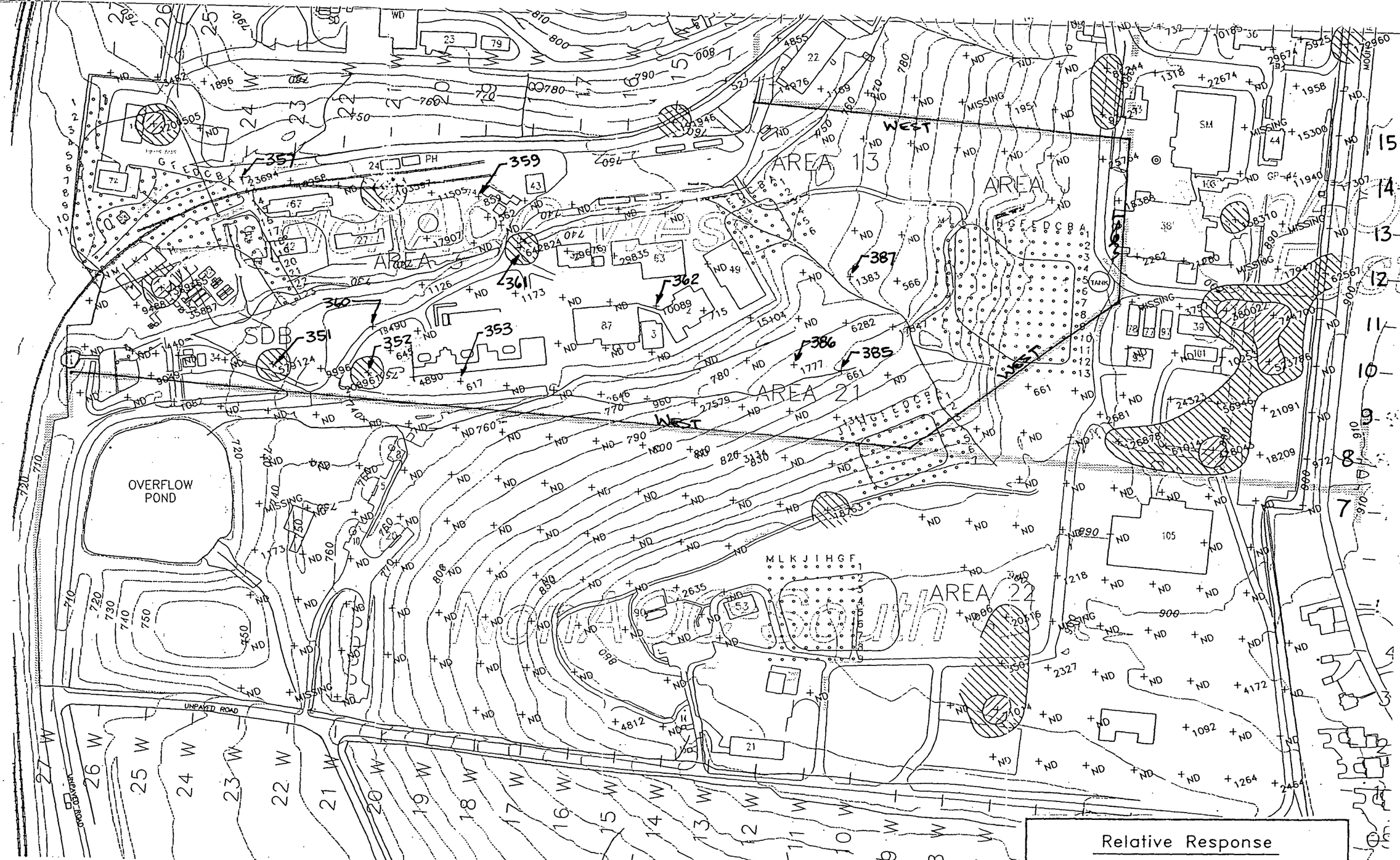


Relative Response

Total Aromatic Hydrocarbons

Plate 2

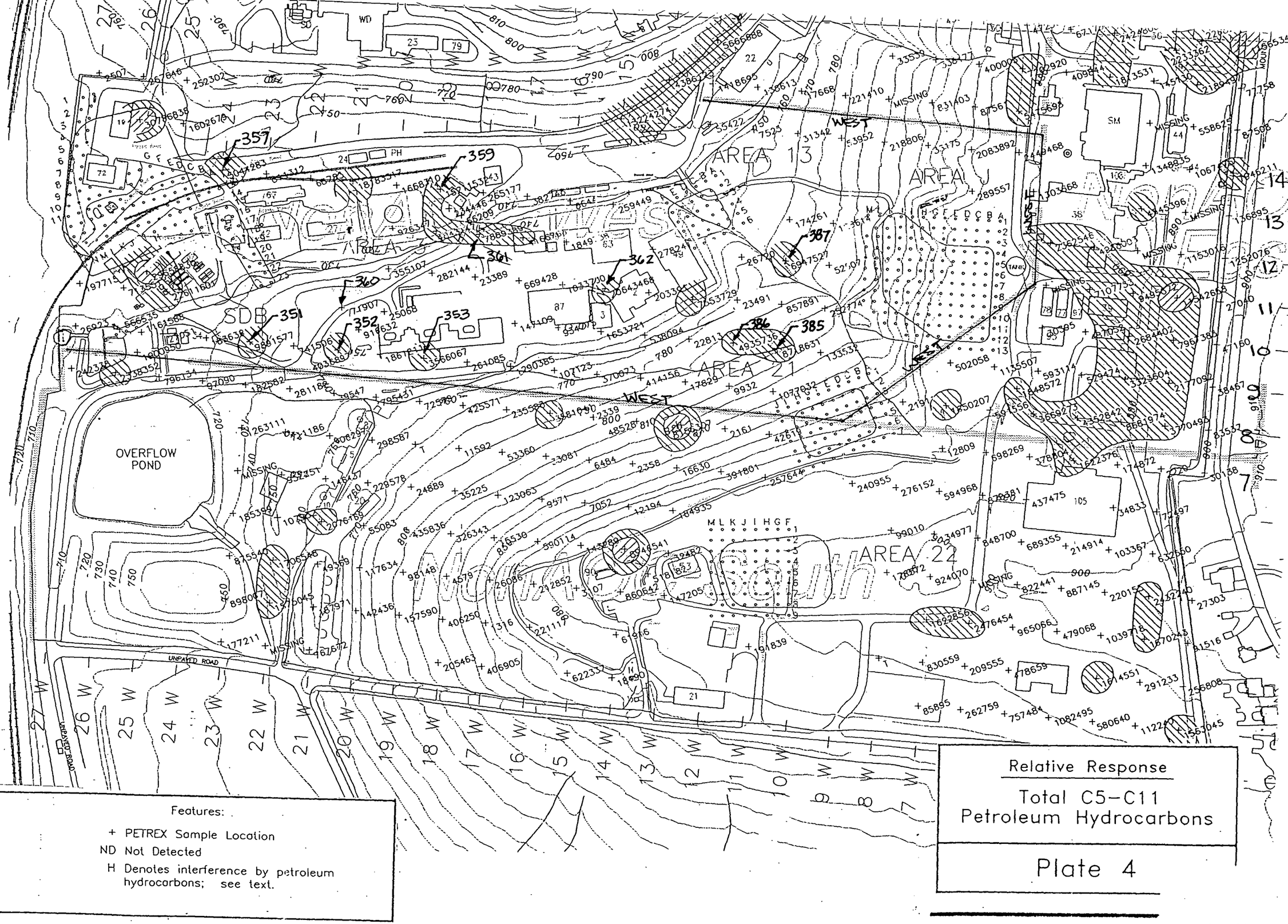
Drawn By: | Project #: | NonAOC/Operable Unit-5

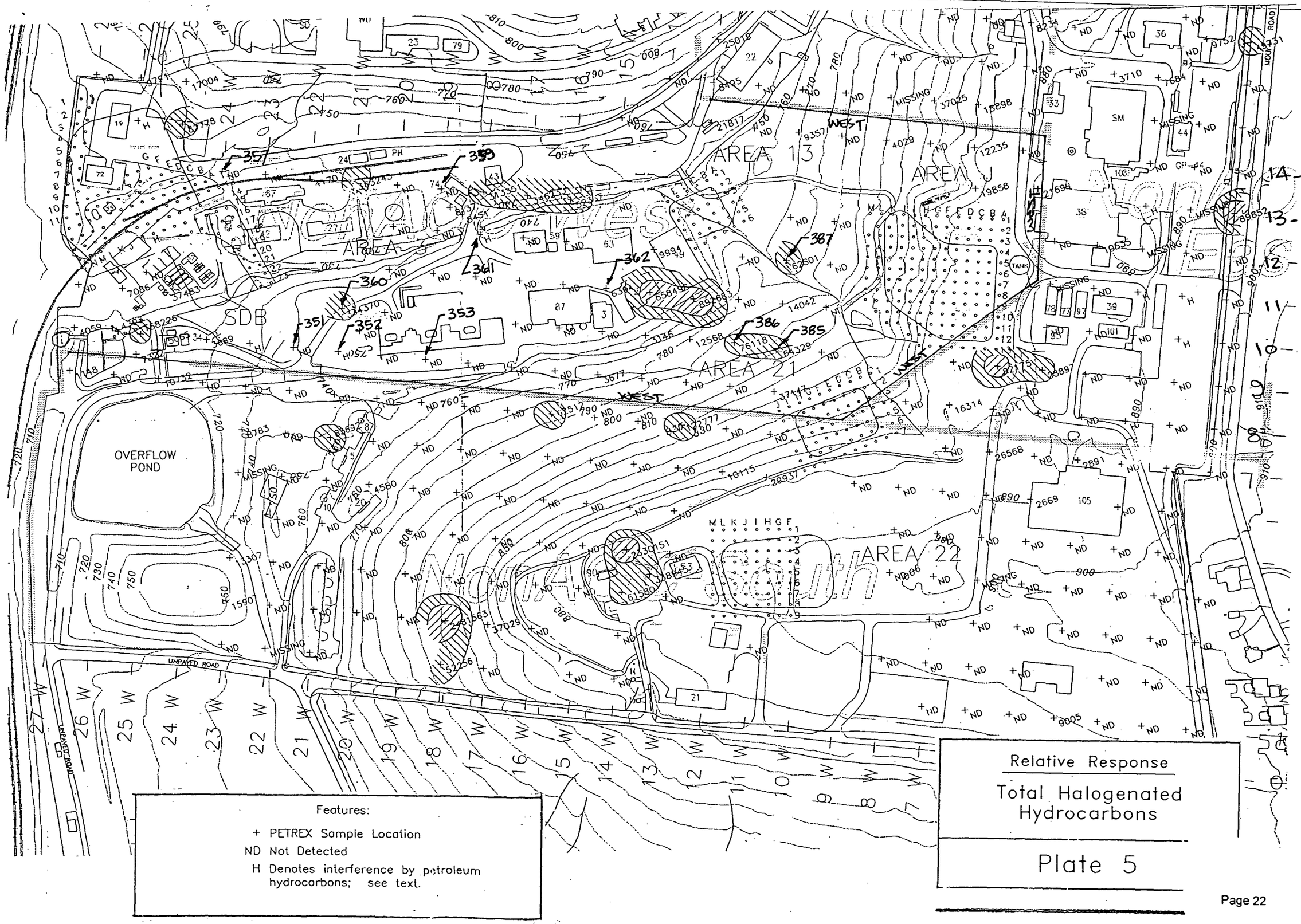


Relative Response

Total Semivolatile Hydrocarbons

Plate 3


AREA 13
AREA 21
AREA 22
SDB
OVERFLOW POND
UNPAVED ROAD
WEST
Features:
+ PETREX Sample Location
ND Not Detected
H Denotes interference by petroleum hydrocarbons; see text.
Relative Response
Total C5-C11 Petroleum Hydrocarbons
Plate 4


AREA 13
AREA 21
AREA 22
SDB
OVERFLOW POND
UNPAVED ROAD
WEST
Features:
+ PETREX Sample Location
ND Not Detected
H Denotes interference by petroleum hydrocarbons; see text.
Relative Response
Total Halogenated Hydrocarbons
Plate 5

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:
12N15	157.3	65	8.45	4.0	NC	85	b	0.9	a
12N16	157.3	110	8.45	5.5	NC	9	a	0.7	a
12N17	157.3	60	8.45	3.5	NC	WIPE	c	WIPE	c
12N18	157.3	60	8.45	4.5	NC	WIPE	c	WIPE	c
359 12N19	157.3	55	8.45	4.5	NC	19	a	0.5	a
12N20	157.3	65	8.45	4.5	NC	WIPE	c	WIPE	c
12N21	157.3	50	8.45	3.5	NC	WIPE	c	WIPE	c
12N22	157.3	85	8.45	5.5	NC	16	[illegible]	[illegible]	[illegible]
357 12N23	157.3	75	8.45	5.0	NC	WIPE	c	WIPE	c
12N24	157.3	40	8.45	3.5	NC	WIPE	c	WIPE	c
13N01	253.5	180	12.48	10.0	NC	15	a	1.1	a
13N02	253.5	95	12.48	4.5	NC	WIPE	c	WIPE	c
13N03	130	110						WIPE	c
13N25	157.3	40						WIPE	c
13N26	157.3	60						WIPE	c
14N01	253.5	100						WIPE	c
14N02	122.2	80						WIPE	c
14N03	130	75						WIPE	c
14N07	170.3	100						NR	
14N08	170.3	150						NR	
14N09	170.3	145						NR	
14N10	170.3	85						NR	
14N11	170.3	115						NR	
14N12	170.3	130						NR	
14N13	157.3	100	8.45	[illegible]	[illegible]			NR	
14N15	157.3	70	8.45	4.0	NC	WIPE	c	WIPE	c
14N25	157.3	85	8.45	7.0	NC	9	a	0.6	a
14N26	157.3	80	8.45	7.5	NC	8	a	0.7	a
14N27	157.3	150	8.45	9.0	NC	20	a	0.9	a

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

APPENDIX D

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

	FIDLER SURVEY DATA					MOUND SOIL SCREENING FACILITY DATA			
SMPID	Contamination Criteria CH1	FIDLER Readings CH1	Contamination Criteria CH2	FIDLER Readings CH2	FIDLER Readings Out Channel	Plutonium - 238		Thorium - 232	
	Units: CPM	Units: CPM	Units: KCPM	Units: KCPM	Units: KCPM	Units: pCi/g		Units: pCi/g	
	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	Note:	RESULTS	Note:
08N05	130	90	6.5	4.0	NC	WIPE	c	WIPE	c
08N06	122.2	70	5.59	4.0	NC	2	a	0.2	a
08N07	122.2	110	5.59	8.5	NC	[illegible]	a	0.6	a
08N08	122.2	115	5.59	7.5	NC	23	a	0.9	a
08N11	213.2	160	13.13	10.0	NC	11	a	1.1	a
08N12	213.2	160	13.13	10.5	NC	16	a	0.9	a
08N13	213.2	120	13.13	9.0	NC	22	a	0.7	a
08N14	213.2	120	13.13	6.5	NC	10	a	0.9	a
08N15	213.2	[illegible]	13.13	8.0	NC	4	a	0.4	a
08N16	130	120	6.5	6.0	NC	0	a	0	a
08N17	130	50	6.5	6.0	NC	5	a	0.7	a
08N18	130	50	6.5	3.0	NC	11	a	0	a
353 08N19	130	50	6.5	4.0	NC	0	a	0	a
08N20	130	65	6.5	5.5	NC	WIPE	c	WIPE	c
352 08N21	157.3	60	8.45	3.0	NC	WIPE	c	WIPE	c
351 08N22	117.0	60	8.71	4.5	NC	22	a	0.8	a
08N23	117.0	80	8.71	7.0	NC	WIPE	c	WIPE	c
08N24	157.3	110	8.45	7.0	NC	0	a	0.6	a
								0.5	a
08N25	157.3	55						0.8	a
08N26	157.3	80						0.9	a
08N27	143	115						1	a
09N01	253.5	170						1.2	a
09N02	122.2	65						WIPE	c
09N03	122.2	125						WIPE	c
09N04	122.2	85						WIPE	c
09N05	122.2	110						0.8	a
09N06	122.2	75	5.59	4.5	NC	0	a	0.2	a
09N07	122.2	120	5.59	6.0	NC	0	a	1	a

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

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:
09N10	213.2	90	13.13	10.0	NC				
385 09N11	213.2	70	13.13	4.5	NC	8	a	0.9	a
386 09N12	213.2	140	13.13	9.0	NC	18	a	1.2	a
09N13	213.2	140	13.13	9.0	NC	7	a	1.5	a
09N14	130	110	6.5	6.0	NC	14	a	0.8	a
09N15	130	105	6.5	6.0	NC	7	a	0.8	a
09N16	130	60	6.5	4.5	NC	11	a	0.6	a
09N17	130	80	6.5	4.5	NC	2	a	1.1	a
09N18	130	80	6.5	4.5	NC	NC		NC	
09N19	130	70	6.5	4.0	NC	NC		NC	
09N20	130	75	6.5	4.5	NC	NR		NR	
360 09N21	157.3	95	8.45	4.0	NC	NR		NR	
09N22	117.0	80	8.71	6.0	NC	NC		NC	
356 09N25	157.3	50	8.45	4.0	NC	WIPE	c	WIPE	c
09N26	157.3	80	18.45	14.0	NA			NR	
09N27	143	10						0.6	a
10N01	253.5	18						1	a
10N02	122.2	10						WIPE	c
10N03	130	9						WIPE	c
10N04	130	8						0	a
10N05	122.2	8						0.9	a
10N10	213.2	7						0.8	a
10N11	213.2	1						0.6	a
10N12	213.2	9						1.1	a
10N13	130							0.9	a
10N14	130	50	6.5	4.0	NC				
362 10N15	130	85	6.5	5.0	NC	0	a	0.6	a
10N16	130	60	6.5	4.0	NC	WIPE	c	WIPE	c
10N17	130	80	6.5	6.0	NC	0	a	0	a

NR - Not recorded
NC - No sample/reading taken
NA - Reading not taken; contamination criteria not exceeded.
a - Mound Soil Screening Facility detection level not exceeded.
b - Concentration at or above the Mound Soil Screening Facility detection level.
c - Results of the wipe sample were less than 20 disintegrations per minute.
CPM - Counts per minute
KCPM - Counts per minute x 1000
pCi/g - Picocuires per gram

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:
10N18	130	65	6.5	4.0	NC	21	a	0.7	a
10N19	130	80	6.5	8.0	NC	WIPE	c	WIPE	c
10N20	152.1	110	8.45	6.5	NC	0	a	1	a
10N21	152.1	70	8.45	5.0	NC	NC		NC	
10N22	152.1	85	8.45	4.0	NC	NC		NC	
11N01	253.5	150	12.48	9.5	NC	4	a	1	a
11N02	122.2	80	5.59	4.0	NC	WIPE	c	WIPE	c
11N03	130	85	6.5	5.0	NC	WIPE	c	WIPE	c
11N04	130	90	6.5	4.5	NC	0	a	0.5	a
11N05	122.2	105	5.59	5.5	NC	7	a	0.9	a
11N10	213.2	140	13.13	10.5	NC	18		1	
387 11N11	213.2	130	13.13	11.0	NC	25	b	0.5	a
11N12	213.2	85	13.13	7.0	NC	7	a	1.1	a
11N14	130	90	6.5	5.0	NC	WIPE	c	WIPE	c
11N16	183.3	110	11.05	7.5	NC	19	a	0.5	a
11N17	130	50	6.5	4.0	NC	5		0.8	
361 → 11N18	157.3	60	8.45	4.0	NC	WIPE	c	WIPE	c
11N19	157.3	85	8.45	7.5	NC	18	a	0.5	a
11N20	157.3	100	8.45	4.5	NC	WIPE	c	WIPE	c
11N21	87.1	75						NC	
11N22	87.1	75						NC	
11N23	157.3	55						NC	
12N01	253.5	1						0.9	a
12N02	122.2	1						WIPE	c
12N03	130	9						0.7	a
12N04	130	7						0.3	a
12N05	130	1						0.8	a
12N10	213.2	100	13.13	9.5	NC	[illegible]		0.8	a
[illegible]	213.2	135	13.13	8.5	NC	21	a	0.6	a

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

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

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.

PRS Locations

Soil Gas Confirmation Sampling Locations

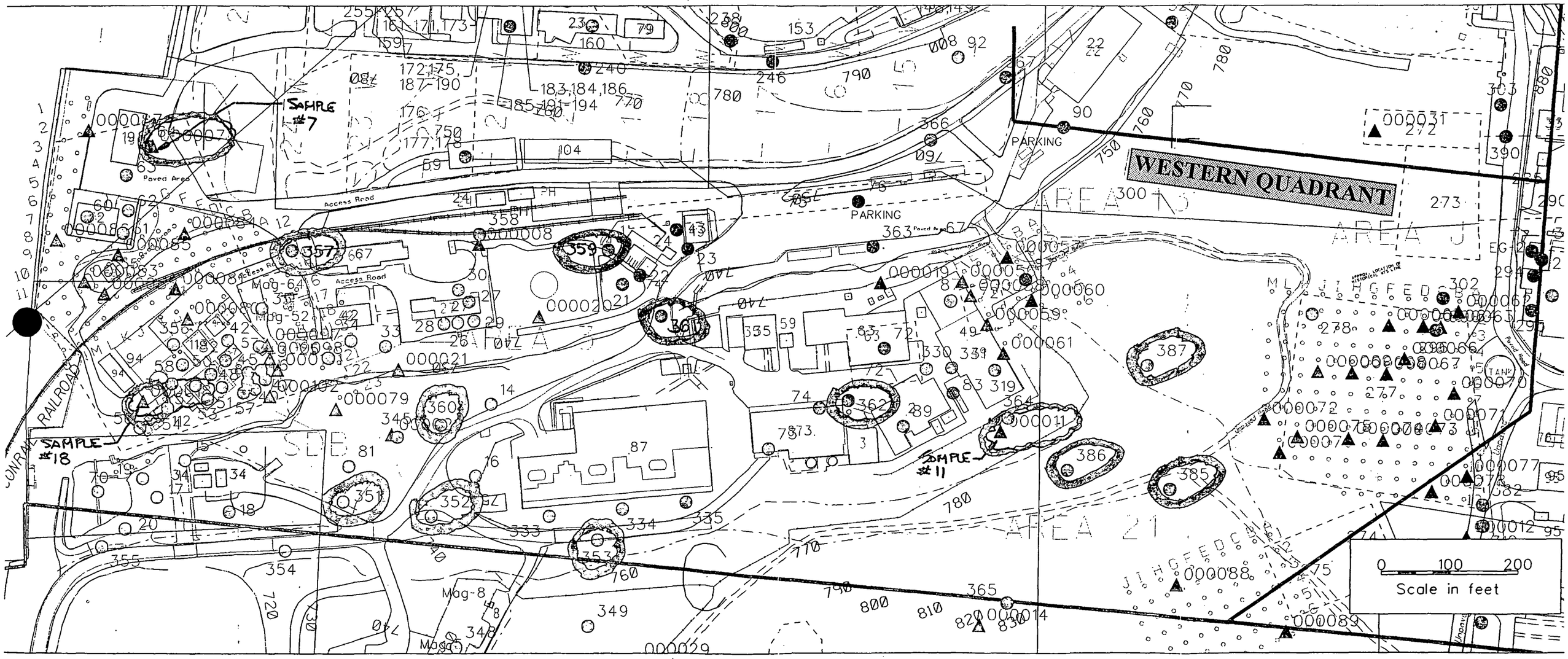


Table A.1

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			26 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.3.

Detected Pesticides/PCB's (μg/kg)

ANALYTE	Background	Industrial Scenario Guideline Criteria	SGC-NAC-000008	SGC-NAC-000010	SGC-NAC-000031	SGC-A66-000041
PETREX Sample Area			WEST	EAST	NORTH	NORTH
Aroclor-1248	ND	380	48			110
Aroclor-1254	ND	4,300	43			
Alpha-Chlordane	ND	NA				
Gamma-Chlordane	ND	NA				
4,4'-DDT	9000	13,000				
Dieldrin	ND	185		4.4	5 *	
Endosulfan I	ND	NA				3.4 *
Endosulfan II	NA	NA				
Endrin	ND	NA			11 *	
Heptachlor	ND	NA				

No entry - not detected
* - Unconfirmed due to interference
NA - Value not available
ND - No detections in background samples
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)

All pesticides / PCB detections for samples #1 - #41 are listed on this page. No Pesticides or PCBs were detected for sample locations 7, 11 or 18.

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)