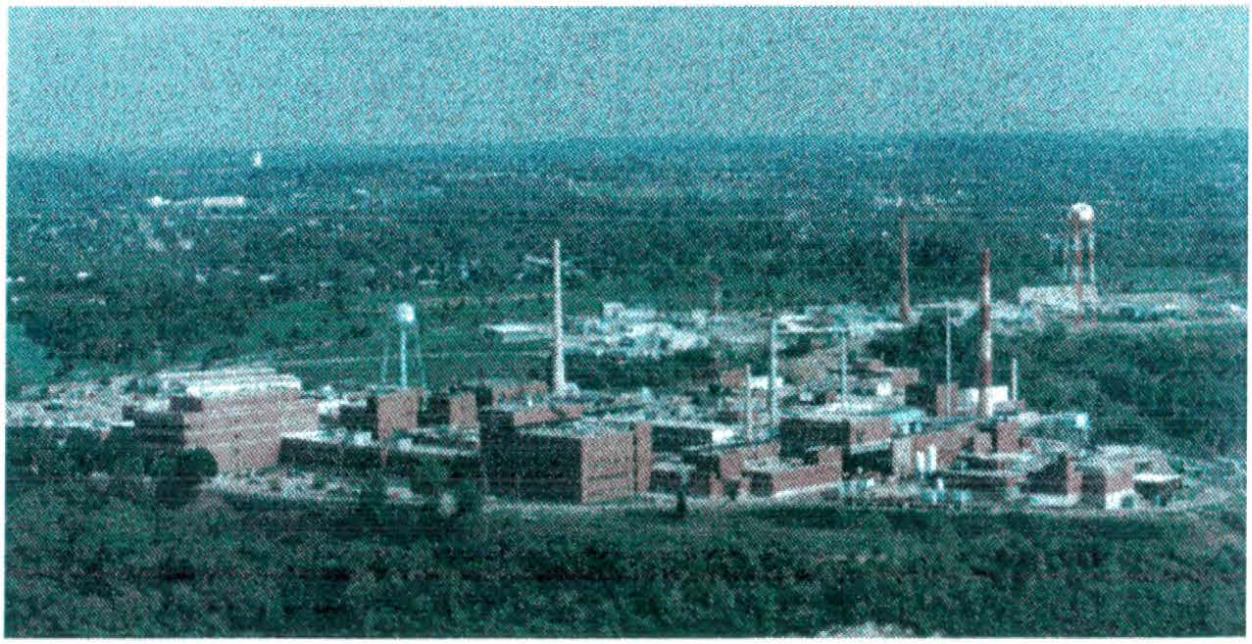
EG&G MOUND-30-03-03-03--9703120052

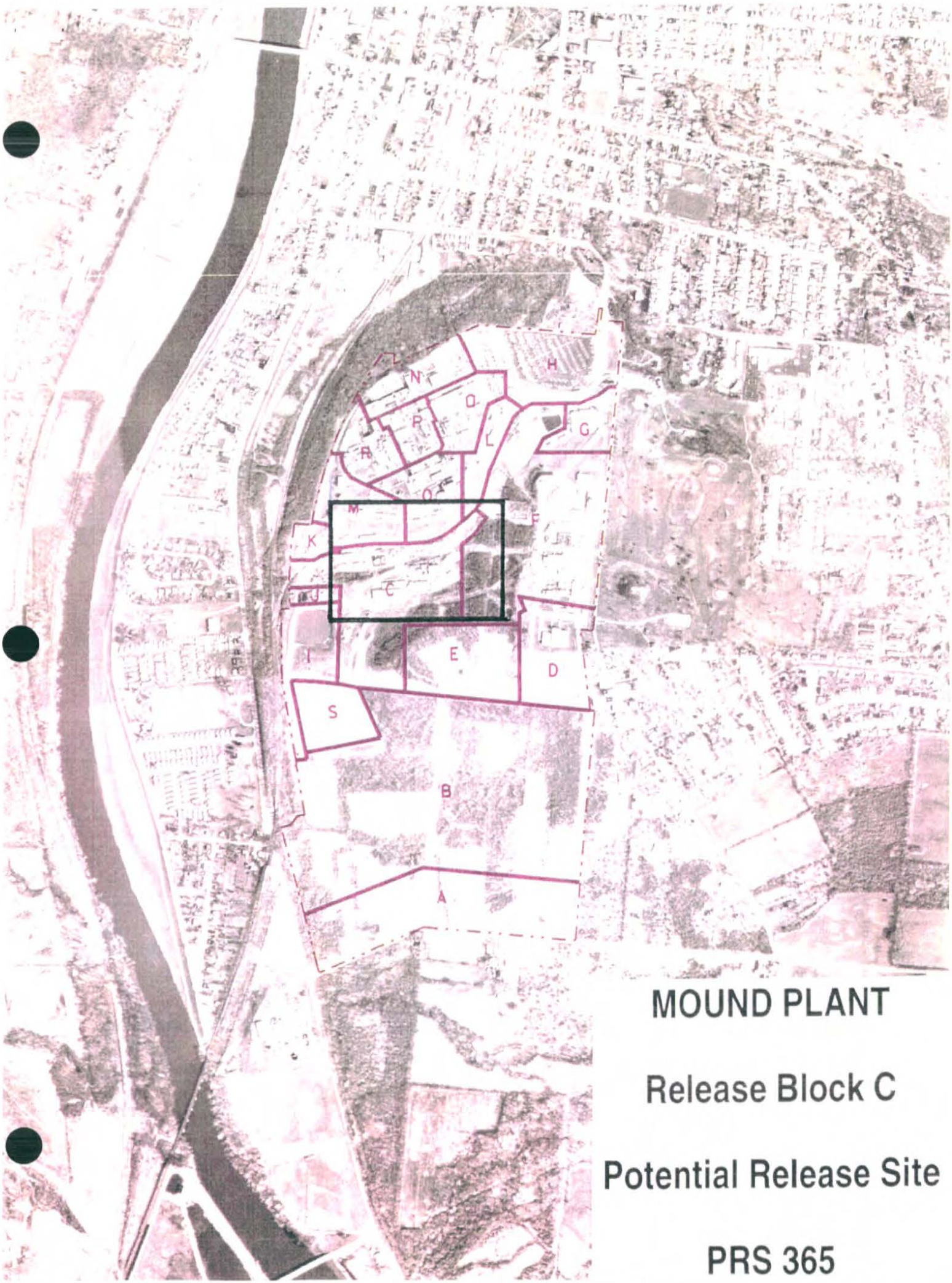
MOUND

Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 365



REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comment.	Dec. 29, 1996
FINAL 1		



MOUND PLANT

Release Block C

Potential Release Site

PRS 365

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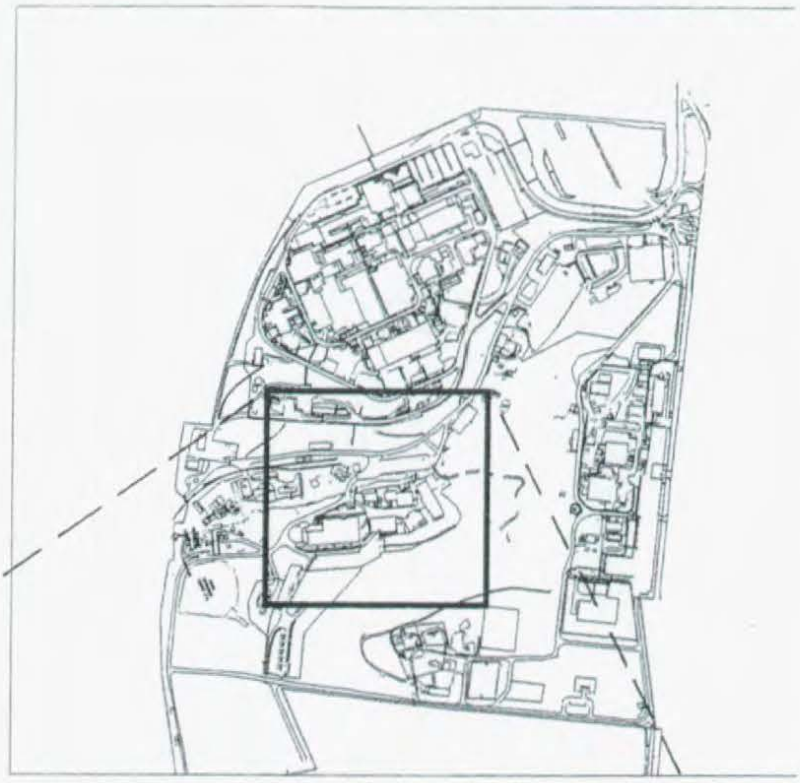
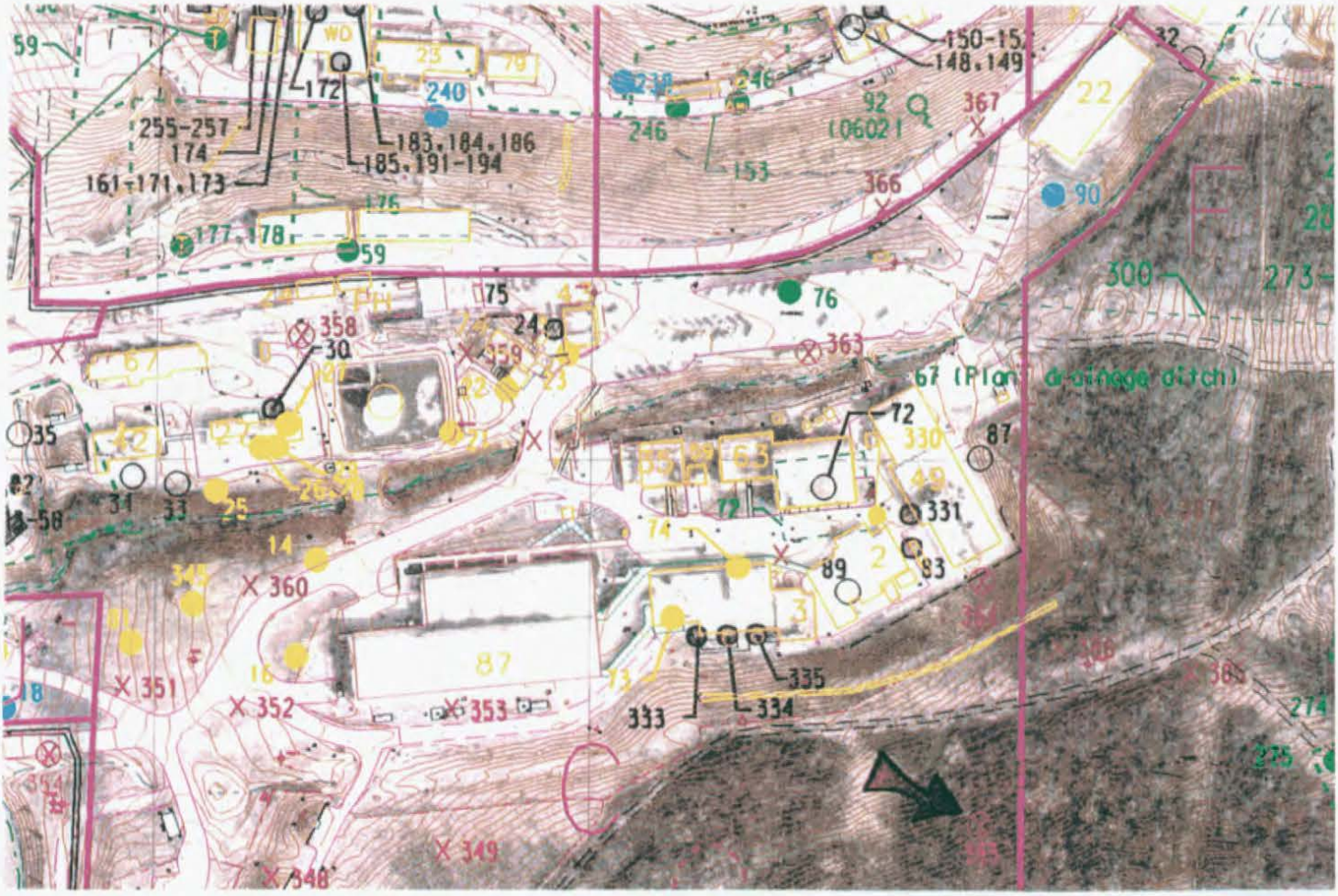
MOUND PLANT

Release Block C

Potential Release Site

PRS 365





365

PRS 365

PRS HISTORY:

Potential Release Site (PRS) 365 was identified as a potential release site as a result of a PETREX passive soil gas survey in 1994.[2] PRS 365 is located in the southern one-third of the Operational Area of Operable Unit 5, on terrain that slopes downward to the west with an average grade of 15%.[1] No activities are known to have occurred at this site, as it is located in an undeveloped wooded area.[1]

CONTAMINATION:

1) In 1994, the ***OU5 Operational Area Non AOC Phase I Investigation***[1,2] analyzed PRS 365 for volatile, semi-volatile, halogenated and petroleum hydrocarbons using a PETREX qualitative soil gas survey. The investigation concluded that PRS 365 contained relatively high ion counts of aromatic, petroleum and halogenated hydrocarbons.[2]

2) As a result of the elevated hydrocarbon detections found during the OU5 Non AOC Phase I Investigation (see paragraph #1 above), a 1996 follow up investigation, the ***Soil Gas Confirmation Sampling***[4] was conducted. The Soil Gas Confirmation Investigation performed a quantitative analysis on a sample (sample #14) taken from within approximately 50 feet of PRS 365. The soil was sampled to a depth of three feet and analyzed for volatiles, semivolatiles, inorganics, pesticides, PCBs, explosives and radionuclides. The analysis failed to show any contaminant concentrations above the applicable Mound ALARA, regulatory or 10^{-6} Risk Based Guideline Criteria. The same was true for sample #28 located approximately 200 feet from PRS 365.

3) In 1983, the ***Radiological Site Survey Investigation***[3] included four surface samples within approximately 75 feet of PRS 365. The investigation detected surface plutonium-238 at a maximum concentration of 0.79 pCi/g, surface thorium-232 at a maximum concentration of less than 2.0 pCi/g and tritium at a concentration of 340 pCi/L. Radiological data from the 1994 ***OU5, Non-AOC Field Report***[2] indicated a concentration of plutonium-238 in surface soil at 7.0 pCi/g and a surface thorium-232 concentration of 0.6 pCi/g. These radiological concentrations are below the Mound plutonium ALARA (As Low As Reasonably Achievable) guideline criteria of 25 pCi/g , the regulatory surface thorium guideline criteria of 5 pCi/g and the tritium regulatory MCL guideline criteria of 20,000 pCi/L.[5,6]

READING ROOM REFERENCES:

1) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Volume I, June 1995. (pages 5-6)
2) OU5, Operational Area Phase I Investigation, Non-AOC Field Report, Volume II, June 1995. (pages 7-17)
3) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993. (pages 18-27)

4) Soil Gas Confirmation Sampling, May 1996. (pages 28-42)
5) Risk Based Guideline Criteria, December 1995.

OTHER REFERENCES:

6) Code of Federal Regulations 40CFR192.41 and 40CFR 192.12

PREPARED BY:

Irwin D. Dumtschin, Member of EG&G Technical Staff
Dean A. Buckner, Member of EG&G Technical Staff

MOUND PLANT
PRS 365
SOIL CONTAMINATION -

RECOMMENDATION:

Potential Release Site (PRS) 365 was identified as a potential release site due to a relatively elevated PETREX passive soil gas survey result in 1994. No activities are known to have occurred at this site, as it is located in an undeveloped wooded area. A soil gas confirmation sample was subsequently collected within 50 feet of this PRS and indicated that all concentrations of volatile, semivolatile, PCBs, pesticides, metals, radionuclides, and explosives, in the soils, were below their respective ALARA, regulatory or 10^{-5} Risk Based Guideline Criteria. Therefore NO FURTHER ASSESSMENT is recommended for PRS 365.

CONCURRENCE:

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

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

OEPA: Brian K. Nickel, Project Manager — 12/17/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

☐ No comments were received during the comment period.

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

REFERENCE MATERIAL
PRS 365

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

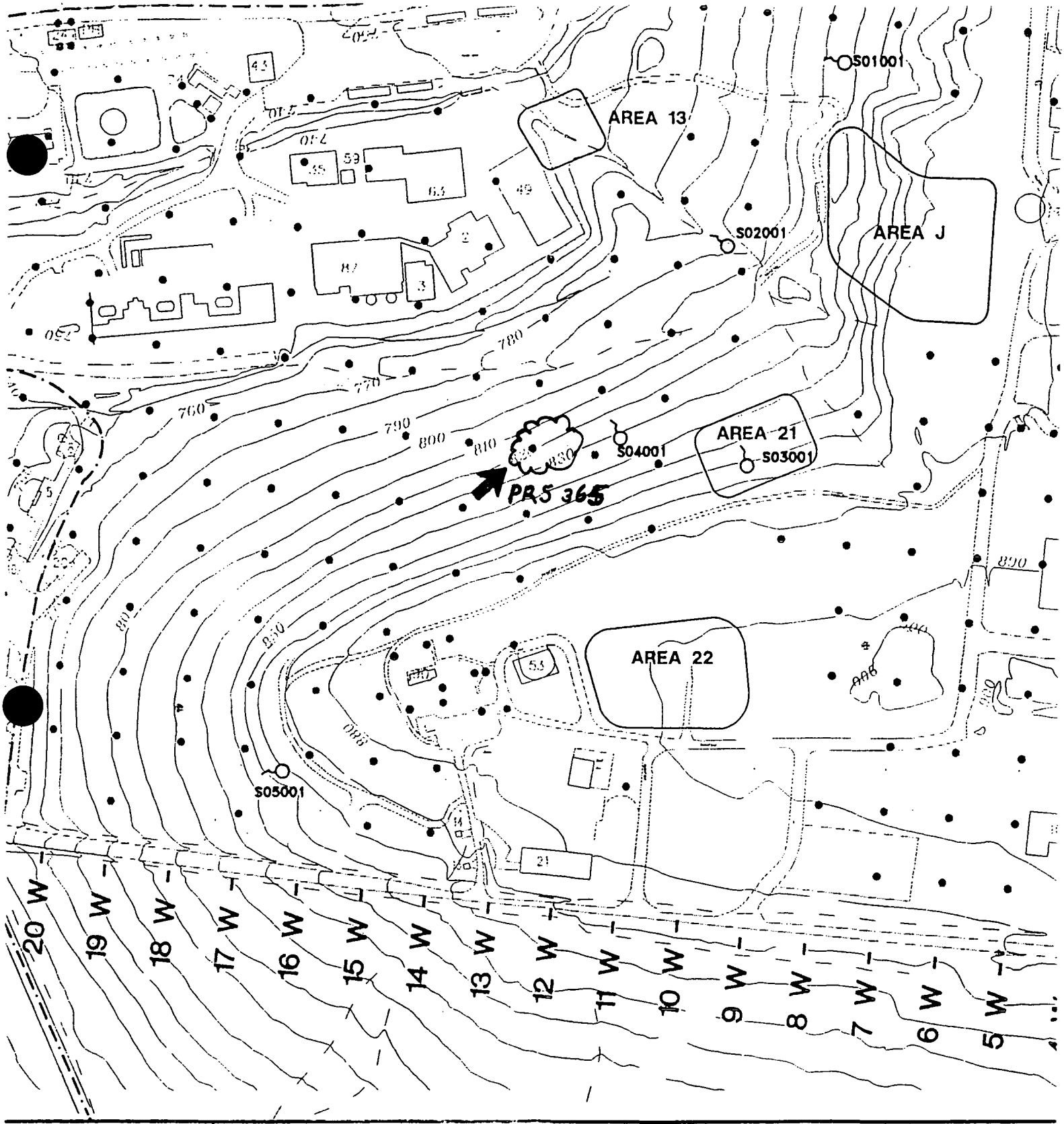
VOLUME I - TEXT

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies



IGURE:

PLATE 1

TITLE:

OU5 NON-AOC STUDY

EGEND

Structures

Plant Boundary

Paved/Unpaved

Non-AOC Sampling and Survey Locations: Soil Gas Samples, Soil Screening Facility Radiological Samples, and FIDLER Survey

Monitoring Well

Piezometer

Document Control No._____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

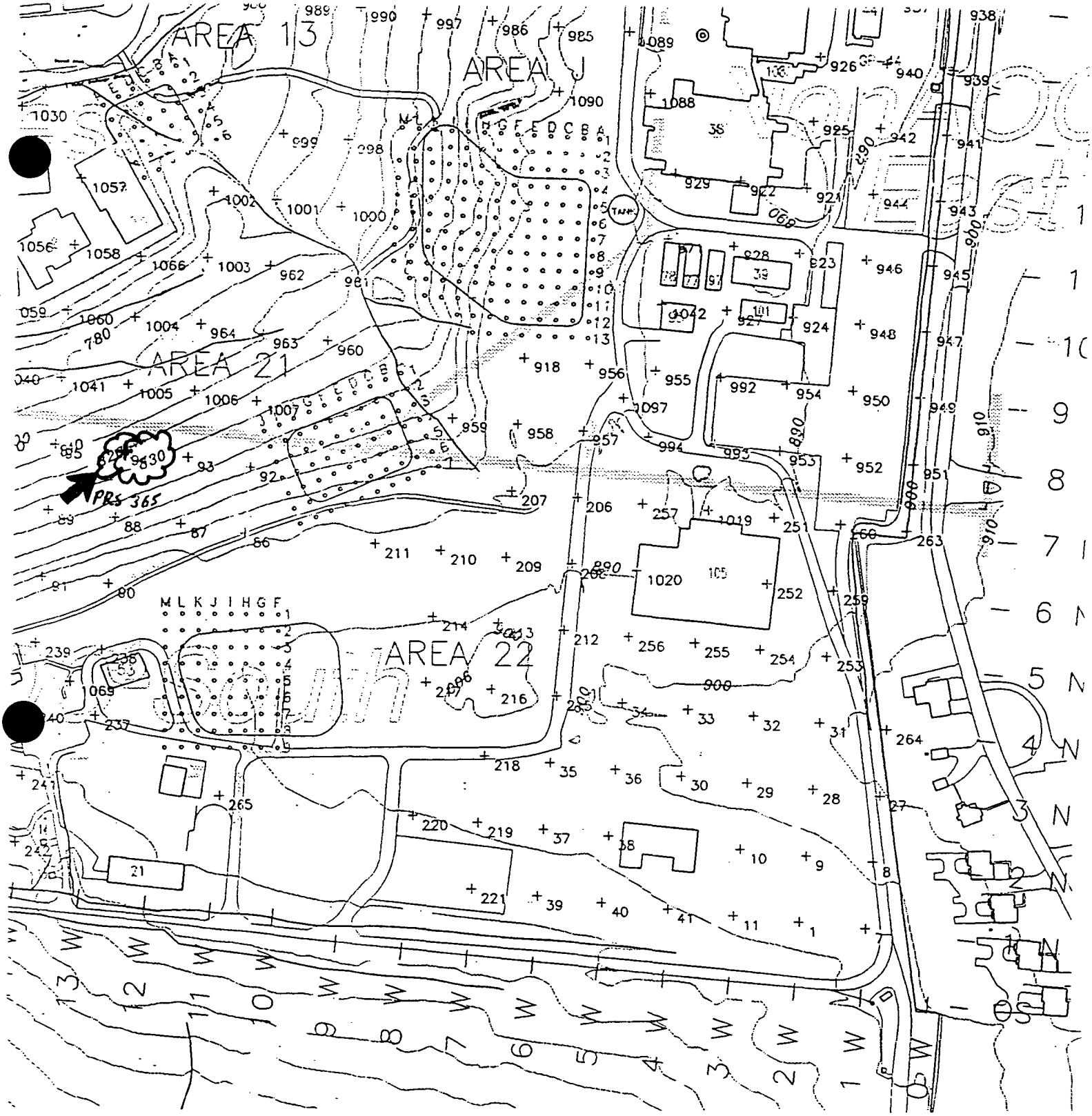
VOLUME II - APPENDICES A-G

June 1995

Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies



Sample Locations

Plate 1

NonAOC/Operable Unit-5

USDOE Mound Facility
Miamisburg, Ohio

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:
07N05	253.5	125	12.48	8.5	NC	11	a	0.8	a
07N06	122.2	85	5.59	4.5	NC	3	a	0.3	a
07N07	122.2	120	5.59	5.5	NC	12	a	0.9	a
07N11	179.4	170	10.92	9.5	NC	0	a	0.7	a
07N12	179.4	175	10.92	10.5	NC	24	a	0.9	a
07N13	179.4	120	10.92	6.5	NC	7	a	0.6	a
07N14	179.4	100	10.92	8.5	NC	27	b	0.8	a
07N15	179.4	140	10.92	9.5	NC	6	a	1.2	a
07N16	179.4	170	10.92	10.0	NC	13	a	0.9	a
07N17	179.4	150	10.92	8.5	NC	0	a	0.8	a
07N18	130	150	6.5	10.0	NC	26	b	1.3	a
07N19	130	85	6.5	5.5	NC	20	a	1.1	a
07N20	157.3	120	8.45	6.0	NC	12	a	0.6	a
07N21	157.3	90	8.45	7.5	NC	7	a	0.7	a
07N22	143	95	6.63	5.0	NC	5	a	0.4	a
						12	a	0.8	a
07N23	143	115	6.63	8.0	NC	11	a	0.8	a
						25	b	1.0	a
07N24	143	100	6.63	5	NC	12	a	0.5	a
						19	a	0.6	a
07N25	143	70	6.63	5	NC	10	a	0.5	a
07N26	143	90	6.63	4.5	NC	4	a	0.3	a
						0	a	0.5	a
07N27	143	110	6.63	8.5	NC	10	a	0.9	a
						3	a	0.7	a
08N01	253.5	175	12.48	9.5	NC	4	a	0.9	a
08N02	122.2	75	5.59	4.5	NC	WIPE	c	WIPE	c
08N03	122.2	85	5.59	4.0	NC	WIPE	c	WIPE	c
08N04	130	80	6.5	3.5	NC	WIPE	c	WIPE	c

Results for volatile petroleum hydrocarbons derived from samples #50, and #220 (from the NonAOC-South) and sample #892 (from the NonAOC-North) have been replaced with the symbol "F". This designation indicates that the TD-MS results yielded by these samples do not accurately represent the level of petroleum hydrocarbons in the soil gas due to interference caused by terpene compounds (see section 8.2).

Results of the survey of each geographic units of the NonAOC are presented individually in Tables 1, 2, 3, 4, and 5 in Appendix B. Soil Gas Sample Mass Spectra which best illustrate survey results are provided in Appendix C. Plates 1 through 5 illustrate the areal distribution of targeted compounds in the soil gas across the NonAOC. As these plates are oversized, they are provided separately and unbound.

TD-MS response to target compounds displayed in Plates 2 through 5 is highlighted by isopleths (contour lines). The sole purpose of the isopleths is to highlight naturally occurring differences (e.g., breaks or lows) in the ranges of analytical response to the target compounds. Population groupings by which isopleths were chosen are displayed in histograms of the data sets (see Appendix D). These isopleths help define areas of the site which exhibit elevated levels of the targeted compounds in the soil gas and, by doing so, aid in the interpretation of survey results.

Note, to maintain consistency in data handing and evaluation, the response to targeted compounds in the eleven samples collected within the NonAOC-South as part of fieldwork for the NonAOC-West or the NonAOC-East have been highlighted by isopleth chosen according to population breaks observed in the NonAOC-West or NonAOC-East data sets.

8.2 Findings

Sample analysis indicated the occurrence of petroleum hydrocarbons common to fuels and oils, and numerous halogenated hydrocarbons common to solvents in the soil gas within each geographic division of the NonAOC. However, not all compounds were detected in all samples. The occurrence in the soil gas of targeted VOC's and SVOC's specific to each geographic division of the NonAOC is discussed below.

8.2.1 NonAOC-South

C_4 to C_8 petroleum hydrocarbons were detected at low to only mildly elevated levels in the majority of the samples from the NonAOC-South. The most pronounced of these hydrocarbons were the aromatics benzene, toluene, and ethylbenzene/xylenes (BTEX), and lightweight cycloalkanes/alkenes (see the mass spectrum of sample #10 and #94). The combination of lightweight petroleum hydrocarbons demonstrated by the majority of the samples likely indicates the occurrence in the subsurface of traces or very low levels of the dilute residue of well weathered fuels. The light weight aromatics and cycloalkanes/alkenes are common components of most fuels both light and heavy weight. Thus what specific products may have contributed to their presence in the subsurface is unclear. Only one sample, #219, demonstrated slightly elevated levels of higher weight hydrocarbons, including some semivolatiles, which may indicate that a heavy weight product was released nearby.

samples, #50 and #220, demonstrated mild interference to the identification of petrol hydroca due to the presence of terpenes. Terpenes are hydrocarbon com derived from plant resins. enes may enter the soil gas naturally throug growth or may be released into the environmen mponents of products c ng terpenes (e.g., turpentine, natural oils, etc.). The recorded respo levels by these two samples for aromatic hydrocarbons and total petroleum hydro accurately reflect the level of these compounds in the soil gas due t interference. Thus, the are excluded from reporting and replaced with the le in Table 1 and on Plate 2 and 4. Despite interference, and taking into ac e effects of terpenes on the samples, it is apparent that on low relativ s of aromatic hydrocarbons and total C_5 to C_{11} petroleum hydrocarbons may sent in the soil gas at the collection points of these two samples.

Halogenated organic compounds were detected rarely in the soil gas within the NonAOC-South, but several occurrences are notable (see the mass spectra of samples #25, #86, #94 and #1069). A pronounced level of tetrachloroethene (PCE) was detected in sample #94. Pronounced levels trichloroethene (TCE) were detected in samples #239, and #1069, and a pronounced level of dich benzene was detected in sample #25. A low but distinct occurrence of trichlorotri roethane (Freon-113) was also detected in sample #86.

8.2.2 NonAOC-West

Elevated levels of petroleum hydrocarbons were detected at numer points within the NonAOC-West. Two distinct comb ions of petroleum hydrocar s were observed. One combination of compounds (exemplified by the mass spectra of samples #1025 and #1085) was typical of the composition of vapor derived fr partially weathered light or medium weight fuels such as gasoline or diesel fuel. The soil gas at the points contained particularly high levels of the C_7 and C_8 aromatics toluene and eth ene/xylenes. Samples #963, #964, #1001, #1025, #1026, #1043, #1048, #1056, #1 #1061, #1062, #1066, #1084, #1085, and #1093 demonstrated the most pronounced l s of the light a atics and other compounds commonly found in light and medium ght fuels. The purity of currence of light weight aromatics, and ethylbenzene/xylene particular, in samples #1026, #1046, #1048, #1056, #1059, #1062, #1066, and #1 may alternately be an indication of the currence in the subsurface of component industrial solvents or paint thinners (see the ma spectrum of sample #1059). Sa s #961, #1008, #1015, #1022, #1035, #1041, and #1071 d nstrated elevated levels o mbinations of hydrocarbons which are typical of the composition apor derived fro eathered medium to heavy weight fuels or oils (see the mass spectra of sam s #1035 #1071). Each of these seven samples contained elevated levels of compounds, p larly cycloalkenes/dienes, ranging from C_4 to C_{14} in weight.

PETREX DATA (RELATIVE)

The areal distribution of halogenated hydrocarbons in the soil gas is displayed in Plate 5. PCE was detected much more frequently in the soil gas than were the other halogenated organics. Thus, the majority of the elevated responses to Total Halogenated Hydrocarbons shown in Tables 1 through 5 and on Plate 5 principally reflects the presence of PCE in the soil gas. Significant exceptions to this rule were the occurrence of pronounced levels of TCE at the collection points of samples #239, #956, #976, #1010, #1058, 1066, #1069, #1077, and #1096 (grid coordinates 4N14W, 9N6W, 20N10W, 9N21W, 10N14W, 10N13W, 3½N13½W, 19N10¾W, and 8N25W, respectively); dichlorobenzene at the collection point of sample #25 (grid coordinate 2N18W); and chloroform at the collection point of samples #887 and #890 (from grid coordinates 20N7W and 18N8W). The highest levels of PCE were detected in the soil gas at the collection points of samples #94, #775, #941, #1024, and #1077 (at grid coordinates 7N13W, 26¼N2¼W, 13N1W, 12N18W, and 19N10¾W).

The occurrence of elevated levels of TCE and dichlorobenzene in the soil gas at sampling points #25 and #239 is the most salient feature of the distribution of halogenated compounds within the NonAOC-South. Although the structure nearest the collection point of sample #239 may relate to a source of halogenated compounds, the collection point of sample #25 appears to be isolated from any potential source and thus may show impact due to past land use.

The occurrence of high levels of halogenated compounds in the center of the NonAOC-West may relates to nearby operations within neighboring Buildings No. 49 and No. 2. Similarly, the zone of elevated halogenated hydrocarbons located immediately to the northwest, nearby Buildings No. 36, No. 59, and No. 63 may also relate to local operations. The distribution of halogenated organics in the soil gas throughout the NonAOC is limited and suggests that any occurrence of halogenated organics in the subsurface is the result of localized small scale releases.

Prominent occurrences of halogenated hydrocarbons in the soil gas at points in the south of in the NonAOC-East and the NonAOC-North generally appear distant from existing structures from which they may originate. Thus, these occurrences may derive from past land use.

10.0 CONCLUSIONS

From the findings of this Petrex soil gas survey the following conclusions may be drawn:

1. Elevated levels of petroleum hydrocarbons occur in the subsurface in many areas of the NonAOC and are likely the result of the release of any of various grades of fuels. However, the potential exists for some occurrences of aromatics to derive from releases of solvents or thinners.

2. The Fuel Area, Area-61, and large portions of the NonAOC-East demonstrate the greatest potential impact to the subsurface by hydrocarbons. Aromatic hydrocarbons which are components of most fuels show the greatest areal distribution within the NonAOC and may pose the greatest risk to subsurface media quality. Principal source areas of petroleum hydrocarbons within the NonAOC include the fuel pumps, separator, and aboveground fuel

storage tank within the Fuel Area, Building No. 61 or operations within Building No. 61, and operations throughout the central portion of the NonAOC-East. Potential sources of petroleum hydrocarbons from outside the NonAOC may exist to the north of the NonAOC-West and to the north of the NonAOC-North.

3. Elevated levels of hydrocarbons detected in the soil gas in the southwestern portion of the NonAOC-East may relate to anomalous levels of these same compounds detected in the earlier survey of AOC-J. Elevated levels of hydrocarbons at numerous locations in the far western sector of the NonAOC-West may relate to the occurrence of hydrocarbons in the soil gas detected in the surveys of AOC-3 and Area-SDB.

4. Elevated levels of halogenated hydrocarbon compounds occur in the subsurface within the NonAOC, but mostly only in numerous small zone which suggest only very limited subsurface impact. The locations of specific source areas of most of the halogenated compounds detected within the NonAOC are unclear. Sources of the majority of the occurrences of halogenated hydrocarbons detected in this survey likely relate to past land use.

5. The areal distribution of halogenated hydrocarbons in the soil gas site wide suggests that these compounds, where they occur in the subsurface, are not subject to widespread subsurface dispersion or migration.

6. Any verification of soil gas results for petroleum hydrocarbons should include quantitative testing of soil and groundwater from the collection points of samples #94 (at 7N13W) and #239 (at 4N14W) within the NonAOC-South; samples #1015 (at 13N26W), #1022 (at 12N[illegible]W), #1056 (at 10N15W), #1085 (at 14N15W), and #1093 (at 9½N24½W) within the NonAOC-West; samples #919 (at 11N2W), #928 (at 11N4W), and #946 (at [illegible]) within the NonAOC-East; and samples #853 (at 26N4W), #974 (at 27N[illegible]), and #1014 (at 16N13W) within the NonAOC-North. Within Area-61 and the Fuel Area, quantitative testing should include soil and groundwater from the collection points of samples #771, #786, #1072, #1074, and #[illegible]5.

7. Any verification of soil gas results for halogenated hydrocarbons should include quantitative testing of soil and groundwater from the collection points of samples #25 (at 2N18W) and #239 (at 4N14W) from within the NonAOC-South; samples #956 (at 9N6W), #1028 (at 12N17W), and #1066 (at 10N13W) within the NonAOC-West; sample #941 (at 13N1W) from the NonAOC-East; and samples #890 (at 18N8W), #[illegible] (at 15N12W), and #976 (at 20N10W) from within the NonAOC-North. Within Area-61 and the Fuel Area, quantitative testing should include soil and groundwater from the collection points of samples #778 and #107[illegible]

8. The environmental significance of the existence of petroleum hydrocarbons and halogenated hydrocarbons in the subsurface can only be evaluated through quantitative testing of soil and groundwater.

PETREX DATA (RELATIVE)

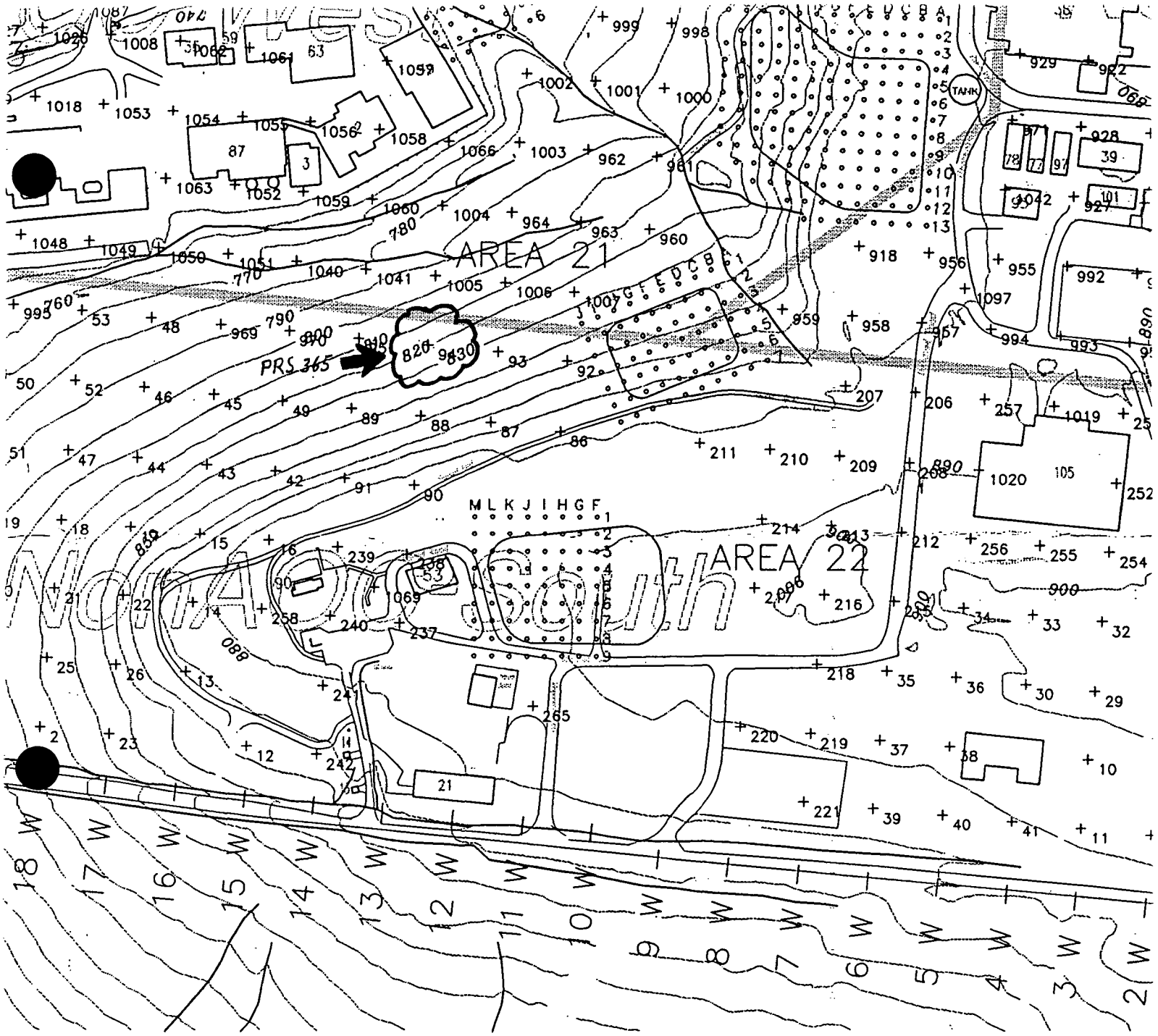
Table 1: NonAOC-South Petrex Soil Gas Survey Results

PETREX DATA (RELATIVE)

NERI Project: 2114-2E
Site: Operable Unit -5, USDOE Mound Facility
Analysis: Thermal Desorption - Mass Spectrometry
Date of Analysis: 8/11/94
Units: Ion Counts

Table 1 (cont'd)

Sample #	Total Aromatic Hydrocarbons (a)	Total Semivolatile Hydrocarbons (b)	Total C5 to C11 Petroleum Hydrocarbons (c)	Total Halogenated Hydrocarbons (d)
48	140,949	ND	235,583	ND
49	2,105	ND	6,484	ND
50	T	ND	T	ND
51	8,811	ND	24,889	ND
52	3,149	ND	11,592	ND
53	144,727	ND	425,571	ND
86	139,235	18,763	257,644	29,937
2086 (e)	71,479	10,022	131,274	16,340
87	150,334	ND	391,801	10,115
88	16,630	ND	16,630	ND
89	1,072	ND	2,358	ND
90	87,895	ND	184,935	ND
91	7,761	ND	12,194	ND
92	41,338	ND	42,619	ND
93	962	ND	2,161	ND
94	2,892,814	3,134	8,156,307	122,777
95	45,617	ND	48,528	ND
206	338,466	ND	698,269	26,568
207	11,825	ND	12,809	ND
208	353,809	ND	870,381	ND
209	365,015	ND	594,968	ND
210	116,821	ND	276,152	ND
211	88,298	ND	240,955	ND
212	519,367	1,218	848,700	ND
213	74,744	ND	134,977	ND
214	70,452	ND	99,010	ND



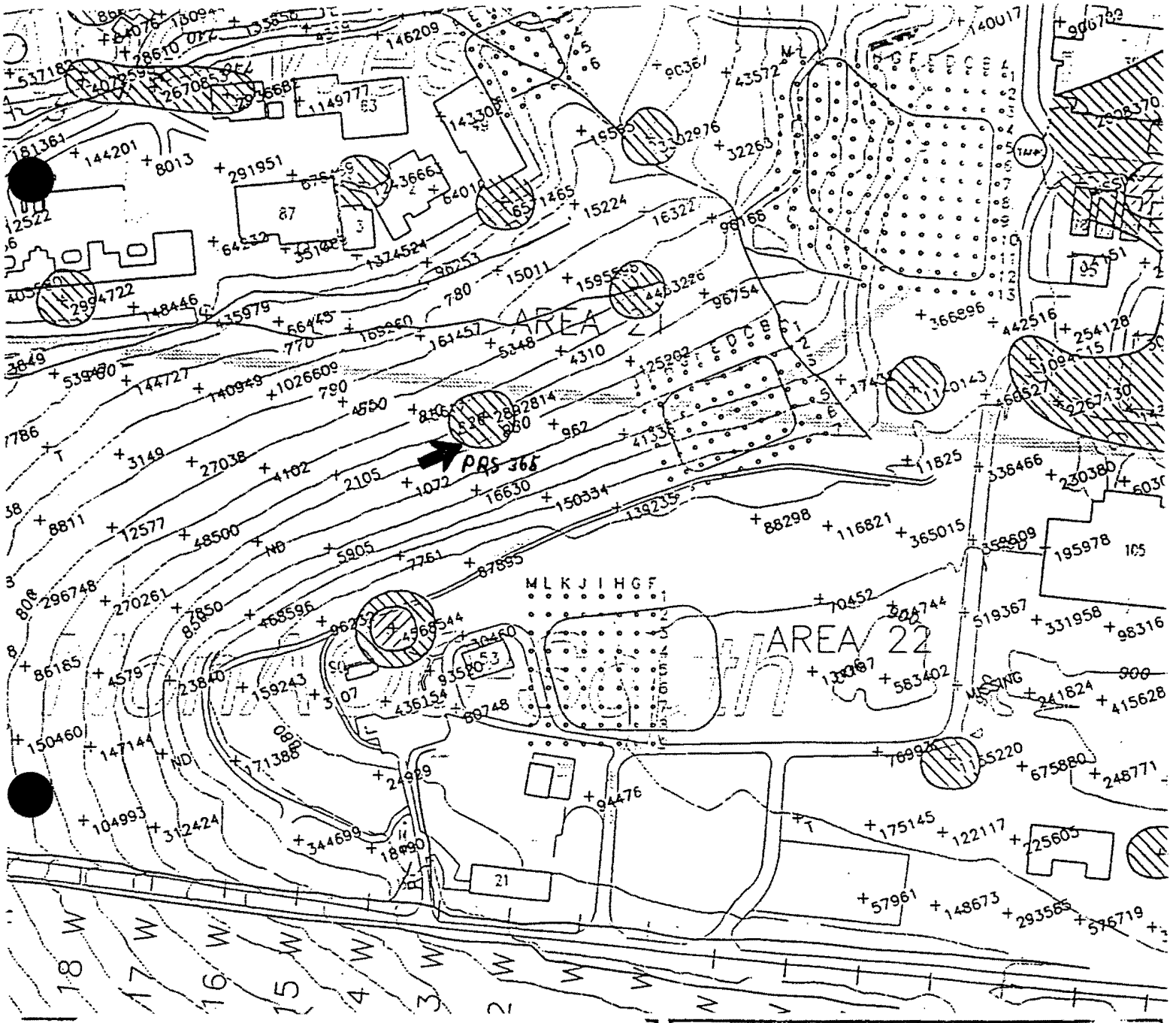
LEGEND

Features:

+ PETREX Sample Location

Sample Locations

Plate 1



PETREX DATA (RELATIVE)

Features:

+ PETREX Sample Location

ND Not Detected

T Denotes interference by terpenes; see text.

Relative Response

Total Aromatic Hydrocarbons

Plate 2

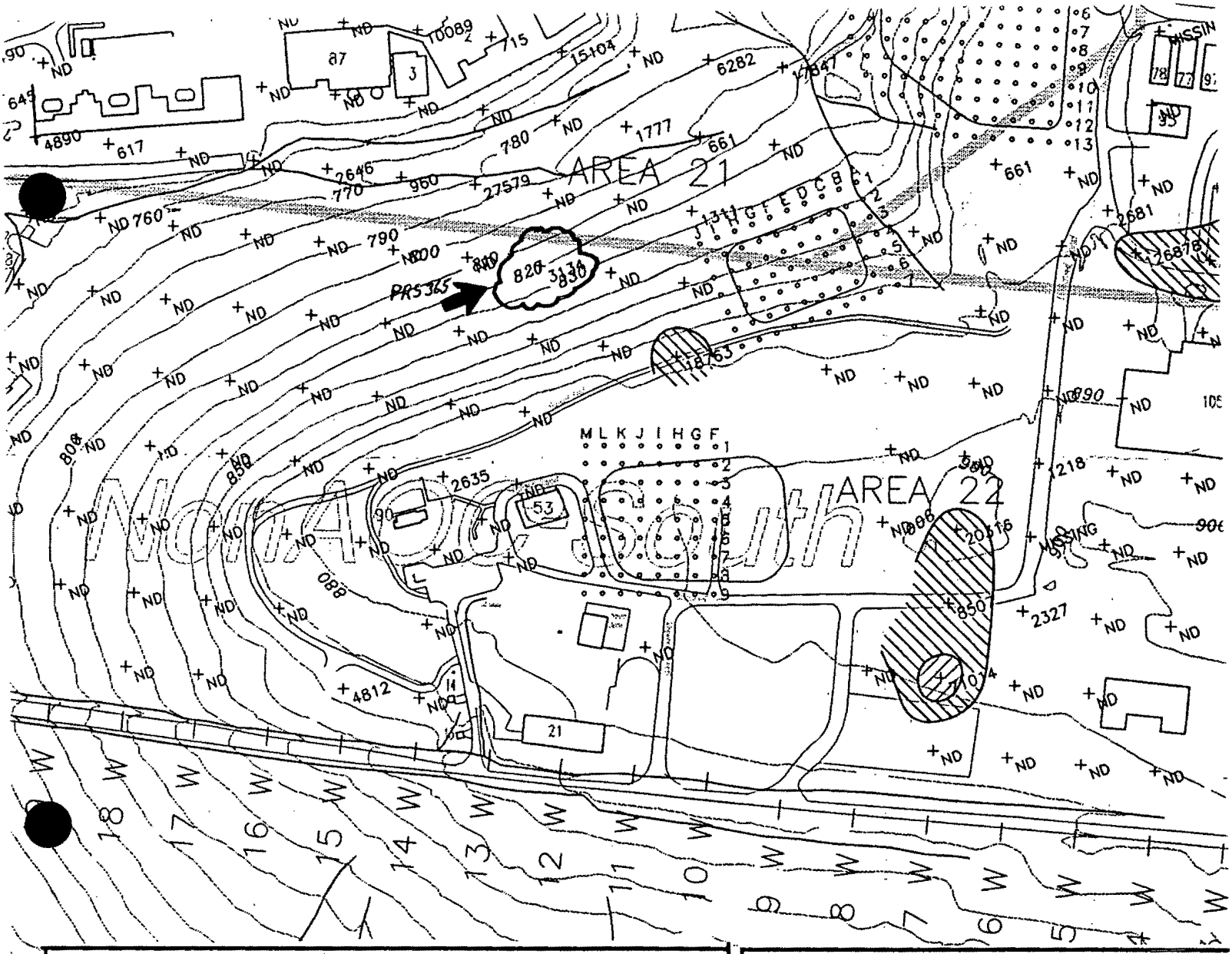
NonAOC/Operable Unit-5

USDOE Mound Facility
Miamisburg, Ohio

PETREX FINGERPRINT TECHNOLOGY©

Relative Resp

NonAOC-South	NonAOC-West	NonA
≥ 4,200,000	≥ 20,000,000	≥ 5,0
850,000-4,199,999	2,600,000-19,999,999	



Features:

+ PETREX Sample Location

ND Not Detected

Relative Response

Total Semivolatile Hydrocarbons

Plate 3

NonAOC/Operable Unit-5

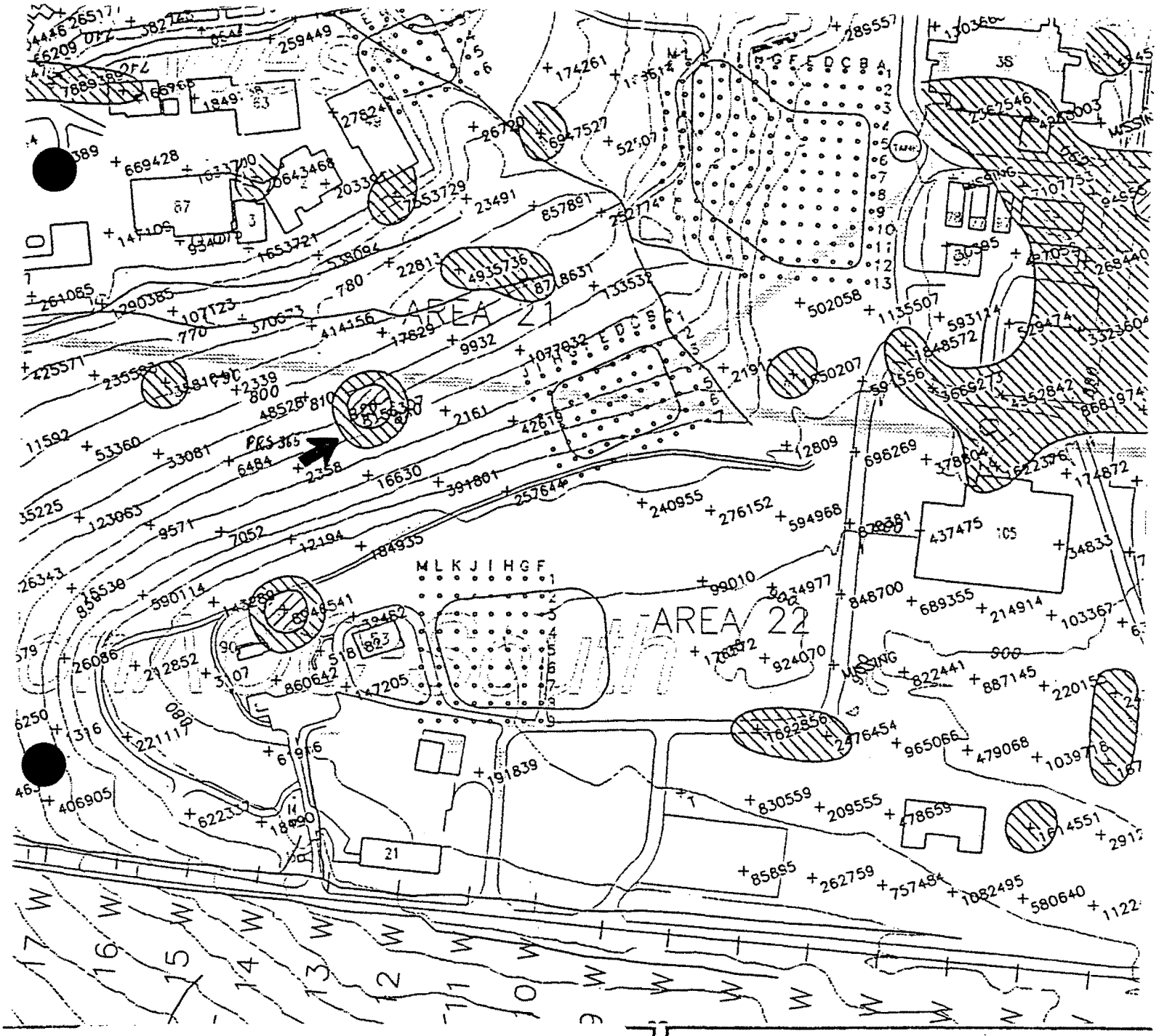
USDOE Mound Facility
Miamisburg, Ohio

PETREX FINGERPRINT TECHNOLOGY©

Relative Res

NonAOC-South	NonAOC-West	Nor
≥ 70,000	≥ 1,000,000	≥ 3(
7,000-69,999	100,000-999,999	30,0

PAGE 15.1



PETREX DATA (RELATIVE)

Features:

+ PETREX Sample Location

T Denotes interference by terpenes; see text.

Relative Response

Total C5–C11 Petroleum Hydrocarbons

Plate 4

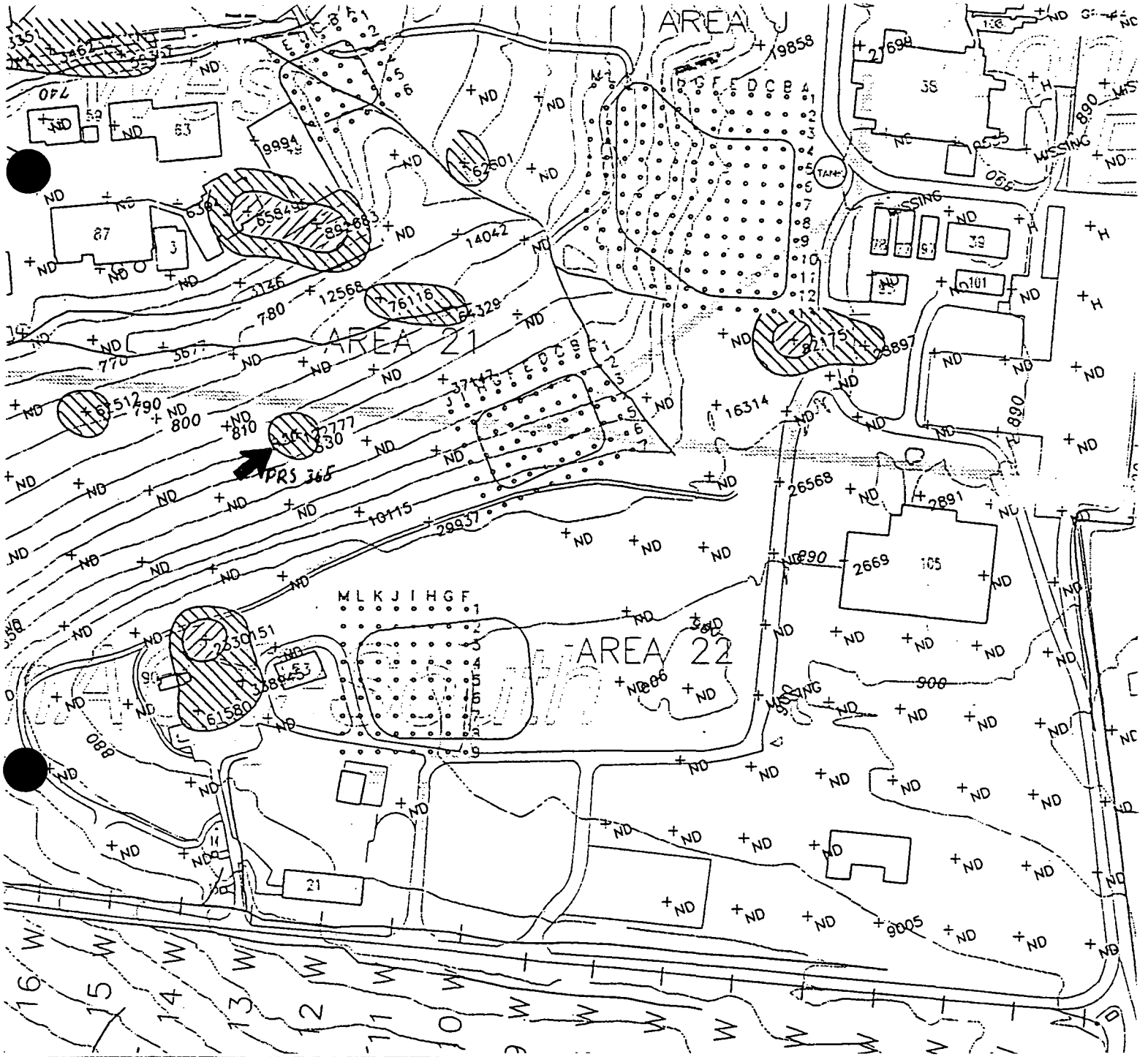
AOC/Operable Unit–5

Mound Facility
Miamisburg, Ohio

Relative Response Valu

NonAOC–South	NonAOC–West	NonAOC–East
≥ 8,000,000	≥ 29,000,000	≥ 11,500,000
1,500,000–7,999,999	3,000,000–28,999,999	1,600,000–11,49

PETREX FINGERPRINT TECHNOLOGY©



PETREX DATA (RELATIVE)

Features:

+ PETREX Sample Location

ND Not Detected

H Denotes interference by petroleum hydrocarbons; see text.

Relative Response

Total Halogenated Hydrocarbons

Plate 5

Operable Unit-5

Mound Facility
Miamisburg, Ohio

Relative Response Values (in

NonAOC-South	NonAOC-West	NonAOC-East
≥ 500,000	≥ 500,000	≥ 80,000
50,000-499,999	50,000-499,999	20,000-79,999

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

ER PROGRAM

MOUND PLANT

Miamisburg, Ohio

PLATE 5

Site Survey Project

Thorium Concentrations

Site Scoping Report: Volume 3,
Radiological Site Survey

AREA
AREA 12
AREA J
AREA 20
PRS 365

AREA 16
AREA 50
AREA
AREA 12
AREA D
AREA J
PLANT DRAINAGE DITCH
PRS 365

ER PROGRAM

MOUND PLANT

Miamisburg, Ohio

PLATE 4

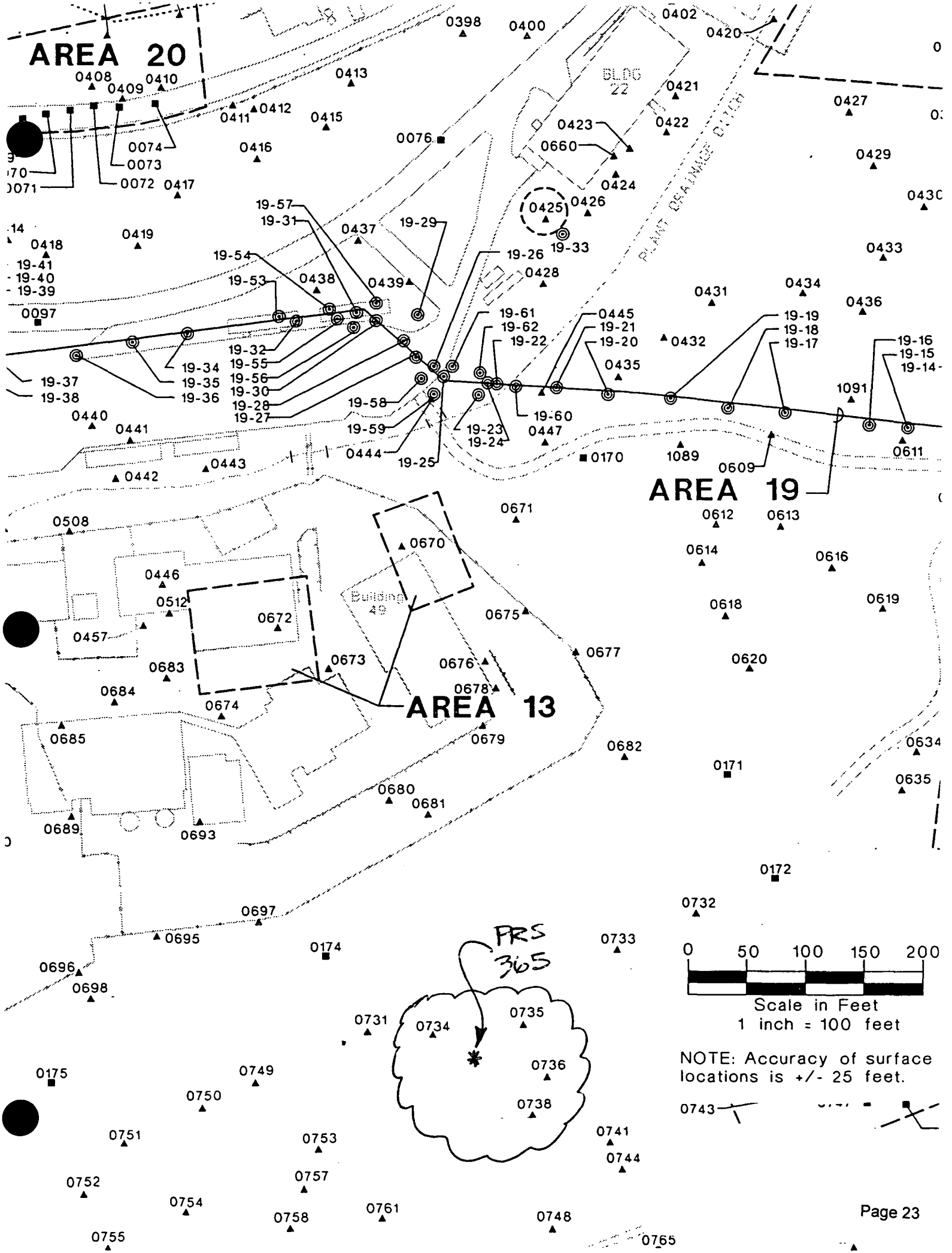
Site Survey Project

Plutonium Concentrations

Prepared for

Site Scoping Report: Volume 3,

Radiological Site Survey


AREA 20
AREA 19
AREA 13
BLDG 22
PLANT DRAINAGE DITCH
Building 49
PRS 365
0 50 100 150 200
Scale in Feet
1 inch = 100 feet
NOTE: Accuracy of surface locations is +/- 25 feet.

1494500 1495000

MANAGERS DESIGNERS/CONSULTANTS

6501 Americas Parkway N.E.
SUITE 800
ALBUQUERQUE, NM 87110
PHONE: (505) 884-5050

ER PROGRAM

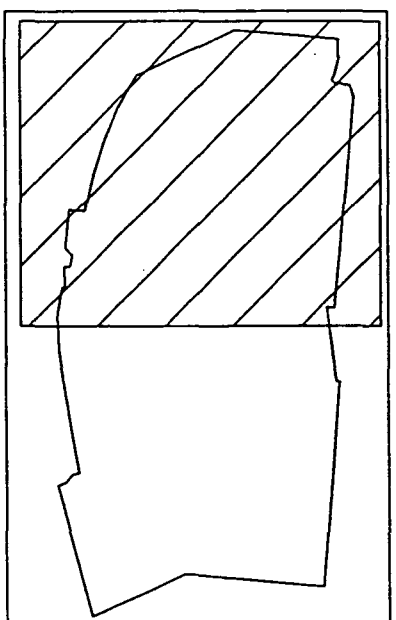
MOUND PLANT

Miamisburg, Ohio

PLATE 1
(1 of 2)

Site Survey Project Sampling Locations

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



Map Location

Legend

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

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)
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					
C0172	3100	3000	8288	10-84	72	0.04	b					
			8289	10-84	120	0.15	b					
S0732	3100	3075	7330	09-84	0	0.47	b					
S0733	3100	3150	2996	10-83	0	0.29	b					
S0734	3100	3325	2995	10-83	0	0.35	b	0.34				
S0735	3125	3250	7329	09-84	0	0.73	b					

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)
S0736	3175	3250	7332	09-84	0	0.79	b					
S0737	3200	3075	7331	09-84	0	1.04	b					
S0738	3200	3275	7333	09-84	0	0.15	b					
C0173	3250	3000	10436	08-85	18	NR	NR		LDL	6.7	0.8	LDL
			10437	08-85	36	NR	NR		LDL	5.6	0.8	LDL
			10438	08-85	54	NR	NR		LDL	1.9	0.9	LDL
			10439	08-85	60	NR	NR		LDL	9.7	0.9	LDL
S0739	3250	3025	7335	09-84	0	0.75	b					
S0740	3250	3100	2997	10-83	0	0.54	b	0.77	LDL	29	1.2	LDL
S0741	3250	3225	7338	09-84	0	0.64	b					
S0742	3275	3050	2998	10-83	0	0.18	b	0.67				
			7337	09-84	0	0.37	b					
S0743	3275	3075	7334	09-84	0	0.33	b					
S0744	3275	3225	7336	09-84	0	0.36	b					
S0745	3285	3010	2999	10-83	0	1.12[c]	b	0.64				
S0746	3295	3005	9790	06-85	0	NR	NR			0.5[e]		
S0747	3295	3010	9794	06-85	0	NR	NR			5.0[e]		
S0748	3295	3300	4127	10-84	0	12.10	b					
C0174	3000	3380	8274	10-84	72	0.03	b					
			8275	10-84	138	0.01	b		LDL	LDL	0.8	LDL
C0175	3000	3640	8518	12-84	90	0.03	b					
			8519	12-84	180	0.01	b					

Location	Mound Plant West	Mound Plant South	Ohio State Plane East (x)	Ohio State Plane North (y)
S0689	3530	2800	1496109.64	597301.55
S0690	3605	2800	1496041.33	597270.59
S0691	3705	2825	1495960.56	597206.54
S0692	3710	2825	1495956.01	597204.48
S0693	3430	2850	1496221.36	597297.29
S0694	3755	2875	1495935.66	597140.36
S0695	3505	2925	1496184.01	597198.02
S0696	3580	2925	1496115.70	597167.06
S0697	3420	2950	1496271.75	597210.33
S0698	3580	2950	1496126.02	597144.29
S0699	4390	3250	1495512.08	596536.68
S0700	4440	3250	1495466.54	596516.05
S0701	4165	3275	1495727.33	596606.79
S0702	4415	3295	1495507.88	596485.38
S0703	3785	3325	1496094.09	596718.11
S0704	3835	3325	1496048.55	596697.47
S0705	3875	3325	1496012.11	596680.95
S0706	4035	3325	1495866.38	596614.91
S0707	4135	3325	1495775.30	596573.63
S0708	3785	3375	1496114.73	596672.56
S0709	4010	3425	1495930.43	596534.15
S0710	4135	3425	1495816.58	596482.55
S0711	3960	3450	1495986.29	596532.01
S0712	4085	3475	1495882.76	596457.65
S0713	3785	3500	1496166.33	596558.71
S0714	3985	3525	1495994.48	596453.38
S0715	3835	3525	1496131.10	596515.30
S0716	4040	3545	1495952.64	596412.46
S0717	4030	3550	1495963.81	596412.04
S0718	4035	3550	1495959.26	596409.97
S0719	4020	3555	1495974.98	596411.61
S0720	4015	3560	1495981.60	596409.12
S0721	4010	3565	1495988.22	596406.63
S0722	4000	3570	1495999.39	596406.20
S0723	3785	3575	1496197.28	596490.40
S0724	3860	3575	1496128.97	596459.44
S0725	3990	3575	1496010.56	596405.78
S0726	3980	3580	1496021.74	596405.35
S0727	3975	3583	1496027.53	596404.68
S0728	3970	3585	1496032.91	596404.92
S0729	3960	3590	1496044.08	596404.50
S0730	3950	3595	1496055.25	596404.07
S0731	3375	3075	1496364.33	597115.05
S0732	3075	3100	1496647.90	597216.12
S0733	3150	3100	1496579.59	597185.16
S0734	3325	3100	1496420.19	597112.92
S0735	3250	3125	1496498.83	597121.11
S0736	3250	3175	1496519.47	597075.57
[redacted]				
S0738	3275	3200	1496507.01	597042.48
S0739	3025	3250	1496755.36	597100.13
S0740	3100	3250	1496687.05	597069.17
S0741	3225	3250	1496573.19	597017.57
S0742	3050	3275	1496742.91	597067.04
S0743	3075	3275	1496720.14	597056.72
S0744	3225	3275	1496583.51	596994.80

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

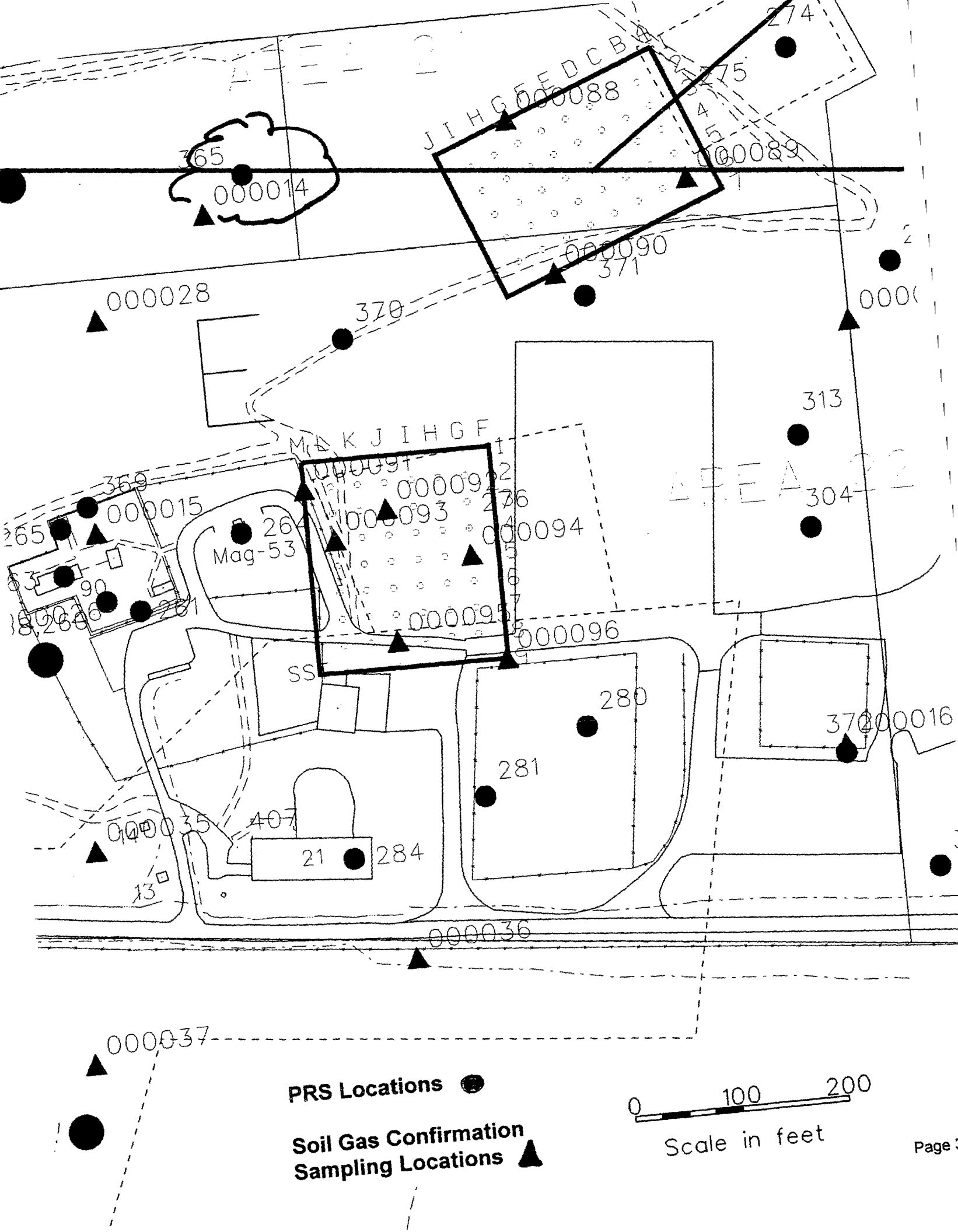

000088
000089
000014
000090
000028
000091
000092
000093
000094
000095
000096
000015
000035
000036
000037
000016
Mag-53
SS
PRS Locations
Soil Gas Confirmation Sampling Locations
0
100
200
Scale in feet

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

ANALYTE	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	Background	10^{-6} Construction Worker Guidelines
VOLATILES (µg/Kg)								
Acetone							NA	105000000
1,2-Dichloroethene (total)						96	NA	21500000
2-Butanone			8 J	10 J			NA	46500000
Benzene						2 J	NA	8900
Carbon Disulfide				4 J			NA	1400000
Chloroform							NA	NA
Chloromethane	4 J						NA	NA
Ethylbenzene						1 J	NA	480
Methylene Chloride	8						NA	NA
Tetrachloroethene							NA	10500000
Toluene		2 J				28	NA	1250000
Trichloroethene				7		3 J	NA	41000
Xylene (total)					1 J	4 J	NA	2150000000

No entry - not detected
mg/kg - milligrams/kilogram
NA - Value not available
NC - Background not comp
ND - No detections in background samples
mg-N/kg - milligrams per kilogram, reported as nitrogen
J - Numerical value is an estimated quantity
B - Analyte detected in blanks associated with this sample

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

ANALYTE	SGC NAC 000023	SGC NAC 000025	SGC NAC 000030	SGC NAC 000031	SGC NAC 000032	SGC NAC 000034	Background	10^{-6} Construction Worker Guidelines
VOLATILES (µg/Kg)								
Acetone			39		29		NA	105000000
1,2-Dichloroethene (total)							NA	21500000
2-Butanone			9 J		6 J		NA	46500000
Benzene							NA	8900
Carbon Disulfide							NA	1400000
Chloroform							NA	NA
Chloromethane							NA	NA
Ethylbenzene							NA	480
Methylene Chloride			12	14	10		NA	NA
Tetrachloroethene							NA	10500000
Toluene	4 J	2 J		2 J	1 J	2 J	NA	1250000
Trichloroethene							NA	41000
Xylene (total)				2 J			NA	2150000000

NOTE: Sample No. 000028 not recorded therefore, volatiles were not detected.

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

ANALYTE	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	SGC NAC 000015	Background	10^{-6} Construction Worker Guidelines
SEMIVOLATILES (µg/Kg)								
Acenaphthene							NA	NA
Acenaphthylene							NA	NA
Anthracene							NA	320000000
Benzo(a)anthracene	57 J				18 J		NA	4100
Benzo(a)pyrene	65 J				21 J		NA	410
Benzo(b)fluoranthene	67 J				22 J		NA	4100
Benzo(g,h,i)perylene	26 J						NA	NA
Benzo(k)fluoranthene	58 J				17 J		NA	41000
Bis(2-ethylhexyl)phthalate		71 J		36 J	35 J		NA	215000
Butylbenzylphthalate							NA	215000000
Carbazole							NA	NA
Chrysene	68 J		20 J		22 J		NA	410000
Di-n-butyl phthalate							NA	105000000
Di-n-octyl phthalate							NA	21500000
Dibenz(a,h)anthracene							NA	410
Dibenzofuran							NA	NA
Diethyl phthalate							NA	NA
Fluoranthene	110 J		31 J		38 J		NA	42500000
Fluorene							NA	NA
Indeno(1,2,3-cd)pyrene	36 J						NA	4100
2-Methylnaphthalene							NA	NA
Naphthalene						61 J	NA	NA
Phenanthrene	53 J						NA	NA
Phenol							NA	650000000
Pyrene	120 J		31	J	37 J		NA	32000000

NOTE: Sample No. 000014 not recorded therefore, Semi-volatiles were not detected.

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

ANALYTE	SGC NAC 000027		SGC NAC 000028		SGC NAC 000029		SGC NAC 000031		SGC NAC 000033		SGC NAC 000034		Background	10^{-6} Construction Worker Guidelines
SEMIVOLATILES (µg/Kg)														
Acenaphthene							570				130	J	NA	NA
Acenaphthylene							40	J					NA	NA
Anthracene							1600				360	J	NA	320000000
Benzo(a)anthracene							3900	D			500		NA	4100
Benzo(a)pyrene							2800				450	J	NA	410
Benzo(b)fluoranthene							2400				360	J	NA	4100
Benzo(g,h,i)perylene							1500				220	J	NA	NA
Benzo(k)fluoranthene							2200				380	J	NA	41000
Bis(2-ethylhexyl)phthalate	24	J	26	J	25	J			27	J	19	J	NA	215000
Butylbenzylphthalate													NA	215000000
Carbazole							830				160	J	NA	NA
Chrysene							4000	D			500		NA	410000
Di-n-butyl phthalate													NA	105000000
Di-n-octyl phthalate													NA	21500000
Dibenz(a,h)anthracene							630				68	J	NA	410
Dibenzofuran							550				95	J	NA	NA
Diethyl phthalate													NA	NA
Fluoranthene							8400	D			1300		NA	42500000
Fluorene							740				160	J	NA	NA
Indeno(1,2,3-cd)pyrene							1600				210	J	NA	4100
2-Methylnaphthalene							160	J					NA	NA
Naphthalene							270	J			28	J	NA	NA
Phenanthrene							7400	D			1200		NA	NA
Phenol													NA	650000000
Pyrene							7000	D			1000		NA	32000000

Table A.3. Soil Gas Confirmation Detected Pesticides/PCB's

ANALYTE	SGC NAC 000008	SGC NAC 000010	SGC NAC 000031	SGC A66 000041	SGC A61 000044	SGC A13 000060	Background	10^{-6} Construction Worker Guidelines
PESTICIDES/PCB (µg/kg)								
Aroclor-1248	48			110	98		ND	380
Aroclor-1254	43				55		ND	21500
Alpha-Chlordane							ND	NA
Gamma-Chlordane						3.7	ND	NA
4,4'-DDT							13000	9000
Dieldrin		4.4	5*				ND	185
Endosulfan I				3.4*	2.4*		ND	NA
Endosulfan II							NA	NA
Endrin			11*				ND	NA
Heptachlor						2.9	ND	NA

NOTE: Sample No.s 000014 and 000028 not recorded therefore, Pesticides/PCB were not detected.

Table A.4. Soil Gas Confirmation Detected TAL Inorganics (cont.)

ANALYTE	SGC NAC 000013		SGC NAC 000014		SGC NAC 000015		SGC NAC 000016		SGC NAC 000017		SGC NAC 000018		Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)														
Aluminum	8460		17700		7370		14100		20000		5130		19000	NA
Antimony													NA	425
Arsenic	1.2	BJ	2.7		3.6	J	3.4		2.4	B	4.1		8.6	320
Barium	53.4		110		51.3	B	68.7		119		21.4	B	180	75000
Beryllium	0.20	B	0.68		0.24	B	0.46		0.96		0.28		1.3	0.7
Bismuth							0.82	B	1.2	B			NA	NA
Cadmium	4.6		7.7		3.7		5.7		8.6				2.1	1050
Calcium	222000	J	94200		342000		133690		23800		157000		310000	NA
Chromium	10.8		22.3		9.1		17.7		24.5		9.3		20	1050000
Cobalt	7.5	BJ	13.9		5.8	B	11.6	B	18.5		5.5	B	19	NA
Copper	13.5	J	22.4		12.2		19.3		26.9		11.6		26	NA
Cyanide			1.8				1.0						ND	21400
Iron	21100		36300		16600		26600		40000		13600		35000	NA
Lead	29.4	J	12.9		14.3		14.1		27.5		8.2		48	NA
Lithium	17.8	B	30.7		15.0	B	25.1		34.1		18.1	B	26	NA
Magnesium	7250	J	8190		4760		14600		6250		47700		40000	NA
Manganese	543		939		689		641		1360		381		1400	135000
Mercury									0.07	B			NC	320
Molybdenum	0.81	B	1.3	B	0.51	B	1.3	B	0.76	B	0.82	B	27	NA
Nickel	17.6		31.4		13.8		23.9		34.4		13.5		32	21500
Potassium	1100	B	2250	B	1010	B	2090	B	3680		1040	B	1900	NA
Selenium													NA	NA
Silver											0.41	B	1700	5500000
Sodium	328	BJ	142	B	248	B	398	B	209	B	398	B	240	NA
Thallium													460	NA
Tin	1.1	B	0.98	B			1.7	B	3.3	B			20	NA
Vanadium	12.9		29.4		10.7		23.8		30.2		10.3		25	7500
Zinc	44.9		92.5		67.7		70.5		103		41.2		140	320000

Table A.4. Soil Gas Confirmation Detected TAL Inorganics (cont.)

ANALYTE	SGC NAC 000025		SGC NAC 000026		SGC NAC 000027		SGC NAC 000028		SGC NAC 000029		SGC NAC 000030		Background	10^{-6} Construction Worker Guidelines
INORGANICS (mg/kg)														
Aluminum	6830		7120		11500		15300		10700		5550		19000	NA
Antimony									0.61	B			NA	425
Arsenic	1.9	BJ	0.61	BJ	3.6	J	2.0	BJ	1.8	BJ	5.6		8.6	320
Barium	49.2		34.1	B	87.6		111		59.1		47.8		180	75000
Beryllium	0.40		0.11	B	0.81		0.96		0.64		0.27		1.3	0.7
Bismuth													NA	NA
Cadmium			2.9										2.1	1050
Calcium	162000	J	315000		68800	J	48400	J	87300	J	158000		310000	NA
Chromium	18.1		8.1		16.2		20.6		14.8		9.7		20	1050000
Cobalt	8.7	B	5.4	B	11.6	B	11.8	B	12.0		5.6	B	19	NA
Copper	30.5		8.7		19.2		16.1		15.3		11.9		26	NA
Cyanide													ND	21400
Iron	24200		16300		30800		35200		25400		13500		35000	NA
Lead	6.9	J	4.9		14.3	J	5.6	J	6.2	J	8.4		48	NA
Lithium	16.3	B	16.7	B	17.0	B	21.4	B	22.5	B	13.4	B	26	NA
Magnesium	14900		4380		9760		5190		5910		52600		40000	NA
Manganese	429	J	417		659	J	593	J	637	J	307		1400	135000
Mercury					0.13	J							NC	320
Molybdenum	2.3	B	0.88	B	1.9	B	0.80	B	0.77	B	1.3	B	27	NA
Nickel	22.2		12.2		25.9		28.2		24.6		14		32	21500
Potassium	443	B	1200		757	B	1400		800	B	873	B	1900	NA
Selenium													NA	NA
Silver													1700	5500000
Sodium	157	BJ	228	B	126	BJ	119	BJ	125	BJ	626	B	240	NA
Thallium													460	NA
Tin	0.89	B	1.3	B	1.1	B	0.67	B					20	NA
Vanadium	10.5		8.1		21.3		22.4		15.4		12.2		25	7500
Zinc	64.6		32.7		109		80.8		58.4		37.4		140	320000

Table A.5. Soil Gas Confirmation Detected Nitrate-Nitrite

ANALYTE	SGC NAC 000001	SGC NAC 000002	SGC NAC 000003	SGC NAC 000004	SGC NAC 000005	SGC NAC 000006	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	83.9	93.8	88.5	83.3	78.4	75.0	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.0	1.8	1.2	2.1	7.2	4.8	26	NA

ANALYTE	SGC NAC 000007	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	83.9	95.0	78.9	83.9	90.1	84.7	NA	NA
Nitrate/Nitrite (MG-N/KG)	1.6	26.5	2.2	5.9	5.3	1.8	26	NA

ANALYTE	SGC NAC 000013	SGC NAC 000014	SGC NAC 000015	SGC NAC 000016	SGC NAC 000017	SGC SAN 000018	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	81.7	80.9	74.0	85.3	72.8	84.2	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.1	4.9	3.0	2.4	6.4	13.7	26	NA

ANALYTE	SGC NAC 000019	SGC NAC 000020	SGC NAC 000021	SGC NAC 000022	SGC NAC 000023	SGC NAC 000024	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	85.3	87.6	77.4	78.3	77.5	89.5	NA	NA
Nitrate/Nitrite (MG-N/KG)	6.5	2.1	6.1	2.2	11.6	2.2	26	NA

Table A.5. Soil Gas Confirmation Detected Nitrate-Nitrite (cont.)

ANALYTE	SGC NAC 000025	SGC NAC 000026	SGC NAC 000027	SGC NAC 000028	SGC NAC 000029	SGC NAC 000030	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	89.3	85.7	85.3	82.0	84.8	89.8	NA	NA
Nitrate/Nitrite (MG-N/KG)	2.0	3.4	2.6	3.6	3.5	3.7	26	NA

ANALYTE	SGC NAC 000031	SGC NAC 000032	SGC NAC 000033	SGC NAC 000034	SGC NAC 000035	SGC NAC 000036	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	87.0	81.2	84.4	88.1	84.6	81.2	NA	NA
Nitrate/Nitrite (MG-N/KG)	4.8	4.2	1.1	3.7	3.5	2.2	26	NA

ANALYTE	SGC NAC 000037	SGC NAC 000038	SGC NAC 000039	SGC A66 000040	SGC A66 000041	SGC A61 000042	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	75.3	84.6	81.8	84.4	89.4	83.6	NA	NA
Nitrate/Nitrite (MG-N/KG)	1.7	2.4	1.4	3.9	2.0	1.4	26	NA

ANALYTE	SGC A61 000043	SGC A61 000044	SGC A61 000045	SGC A61 000046	SGC A61 000047	SGC A61 000048	Background	10^{-6} Construction Worker Guidelines
GENERAL ANALYTES								
% Solids (%)	94.8	96.2	93.0	81.8	85.6	94.8	NA	NA
Nitrate/Nitrite (MG-N/KG)	0.84	0.58	2.1	1.6	7.9	1.6	26	NA

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

ANALYTE	SGC NAC 000008	SGC NAC 000009	SGC NAC 000010	SGC NAC 000011	SGC NAC 000012	SGC NAC 000013	SGC NAC 000014	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)									
Americium-241					-0.238	0.0694		ND	4.95
Bismuth-207					0.0292	-0.0304		ND	0.175
Bismuth-210					0.0355	0.0297		ND	NA
Cesium-137					0.0371	0.0175	0.826	0.42	0.46
Cobalt-60					0.0547	-0.0280		NC	0.1
Plutonium-238	0.0826	0.0233	0.107	0.0718	0.101	0.0107	0.671	0.13	5.5
Plutonium-239/240					0.00154	-0.000127	0.0206	0.18	5.5
Potassium-40	7.72	12.9	15.0	17.8	15.5	4.65	22.5	37	NA
Radium-226	0.571	0.764	0.917	0.778	0.592	0.263	1.10	2	0.14
Thorium-228	0.678	0.779	0.914	0.913	0.697	0.247	1.18	1.5	0.85
Thorium-230	0.541	1.09	1.27	0.902	0.803	0.359	1.09	1.9	44
Thorium-232	0.554	0.838	0.708	0.830	0.769	0.210	1.08	1.4	50
Uranium-234	0.361	0.712	0.897	0.882	0.693	0.378	0.866	1.1	37.5
Uranium-235			0.0459		0.0231	0.0183	0.0548	0.11	3.35
Uranium-238	0.414	0.774	1.06	0.871	0.681	0.424	1.01	1.2	11

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

ANALYTE	SGC NAC 000022	SGC NAC 000023	SGC NAC 000024	SGC NAC 000025	SGC NAC 000026	SGC NAC 000027	SGC NAC 000028	Background	10^{-6} Construction Worker Guidelines
RADIONUCLIDES (pCi/g)									
Americium-241			0.106	-0.110		0.141		ND	4.95
Bismuth-207			0.0167	0.00702		0.0261		ND	0.175
Bismuth-210			-0.0163	-0.0258		0.00683		ND	NA
Cesium-137		0.423	0.383	0.0521	0.401	0.150	0.280	0.42	0.46
Cobalt-60			-0.0131	0.0974		-0.0218		NC	0.1
Plutonium-238	0.0368	0.119	0.523	0.288	0.150	0.259	0.116	0.13	5.5
Plutonium-239/240		0.0162	0.0142	0.00665	0.00705	0.00159	0.00773	0.18	5.5
Potassium-40	17.6	36.6	12.0	18.1	25.7	21.7	24.2	37	NA
Radium-226	1.36	0.987	0.714	1.22	1.00	1.50	0.805	2	0.14
Thorium-228	0.766	1.32	0.775	1.16	0.911	0.986	0.665	1.5	0.85
Thorium-230	1.66	1.08	0.988	1.49	1.20	1.57	0.611	1.9	44
Thorium-232	0.782	1.18	0.938	1.00	0.966	0.915	0.567	1.4	50
Uranium-234	1.14	0.955	0.718	1.07	0.775	1.07	0.435	1.1	37.5
Uranium-235	0.0253		0.0276	0.0467	0.0463	0.0592		0.11	3.35
Uranium-238	1.28	1.10	0.839	1.14	0.862	0.869	0.508	1.2	11