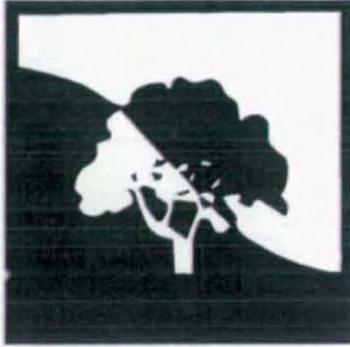


MOUND



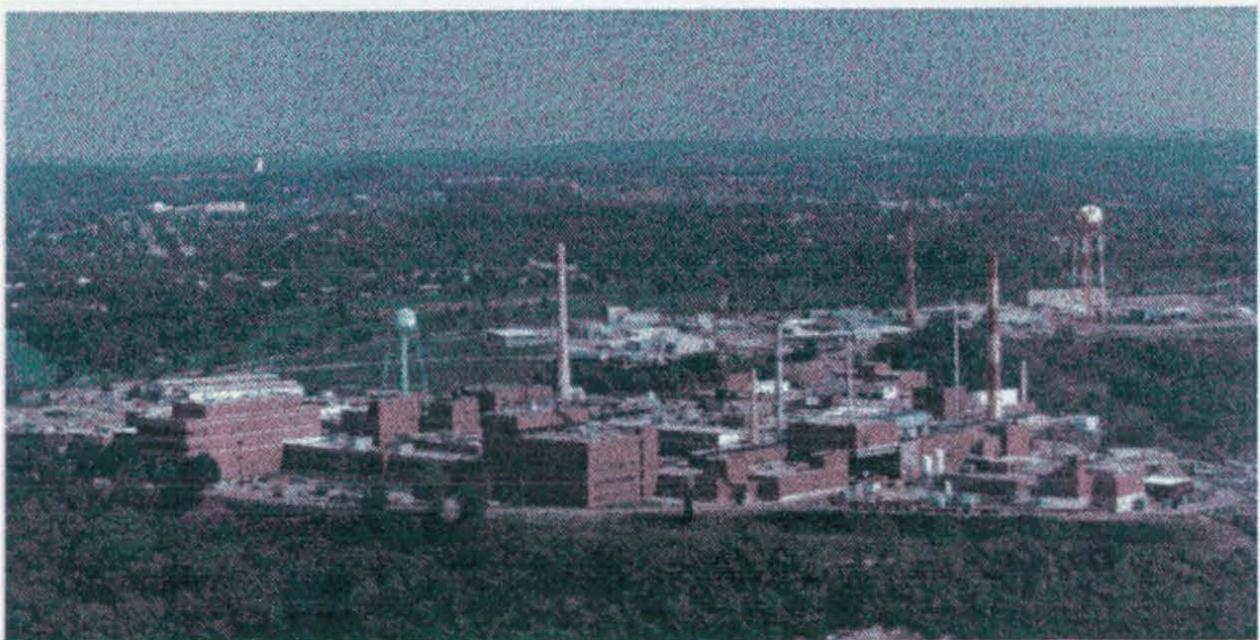
Environmental
Restoration
Program



MOUND PLANT

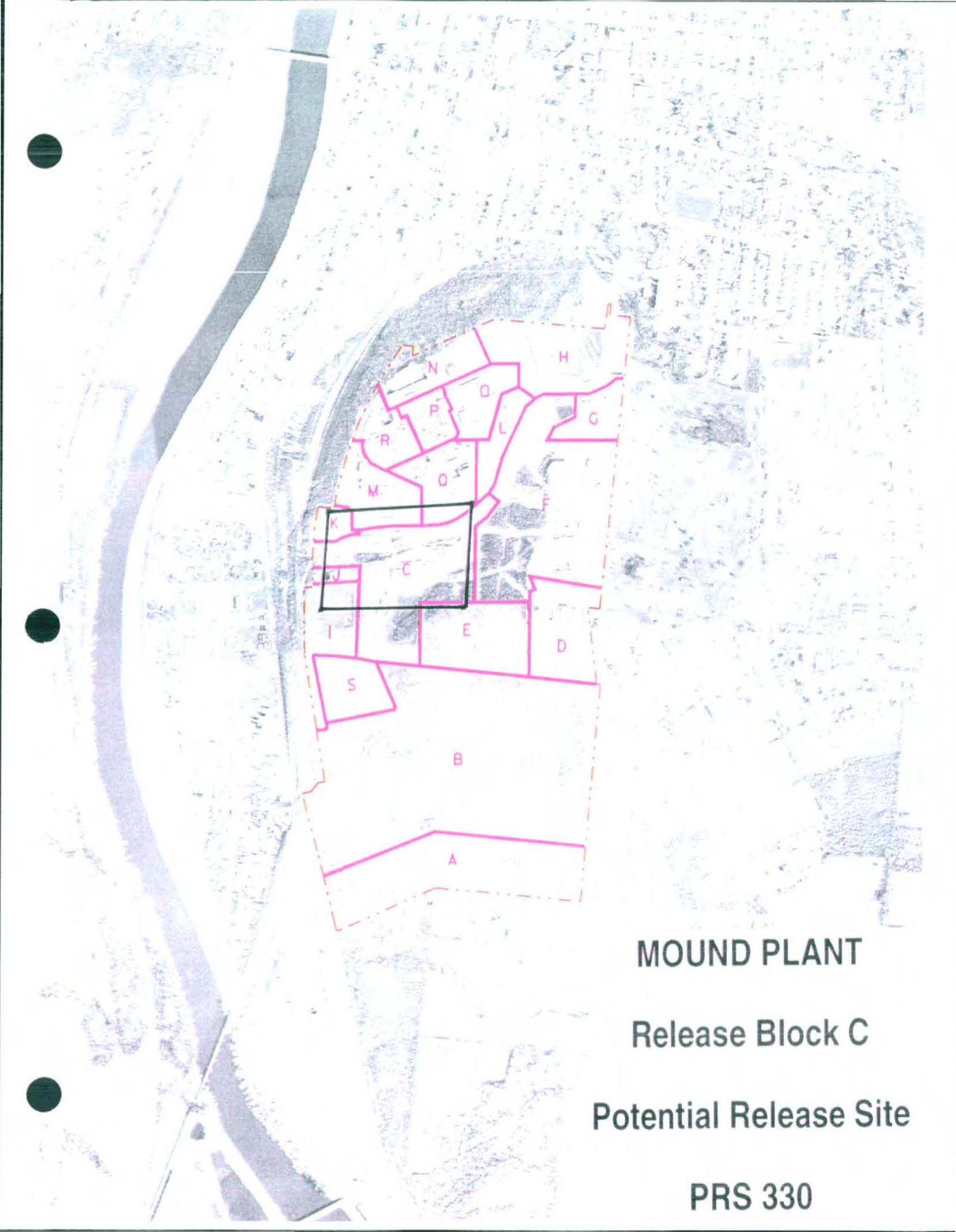
Potential Release Site Package

PRS # 330



PRS 330

REV	DESCRIPTION	DATE
0 PUBLIC RELEASE	Available for comments.	Mar. 11, 1997
1 FINAL		



MOUND PLANT

Release Block C

Potential Release Site

PRS 330



€ 330



A

B

S

I

J

K

M

O

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P

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G

F

D

E

H

N

MOUND PLANT

Release Block C

Potential Release Site

PRS 330





TF2
2-1

330

95 8

PRS 330

PRS HISTORY:

PRS 330 was identified as an underground storage tank (UST), tank 260. The tank was in service from 1956 to 1968. It was used to store No. 2 fuel oil that supported Building 2 located in the Mound Plant Test Fire Area. The tank was removed in 1968. Approximately 8 inches of asphalt was placed over the area in 1972.

PROCESS DESCRIPTION:

Tank 260 was constructed of steel with an external bitumen coating. It had a capacity of 1000 gallons. The tank was located 3 feet below the surface and approximately 30 feet from Building 2. No. 2 fuel oil was supplied to the mechanical room of Building 2 with 3/4" type K soft copper tubing buried approximately 2 feet deep.

There was no hazardous waste or radioactive processes known to have occurred at the location.

CONTAMINATION:

Soil sampling was not performed, for petroleum hydrocarbons, during the removal of the Tank 260. During the OU5, Non-AOC Phase I Investigation, relatively high count values of petroleum hydrocarbons were detected. The Site Soil Gas (Absolute) Survey did not include the location of PRS 330. The Radiological Site Survey did include this location and results indicate Pu-238 at 0.54 pCi/g and Thorium less than 2 pCi/g which is less than the guideline criteria of 25 pCi/g and 5 pCi/g respectively.

READING ROOM REFERENCES:

- 1) OU9 Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 6-8)
- 2) Active Underground Storage Tank Plan, Revised Draft, May 1994. (pages 9-12)
- 3) OU9 Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 13-17)
- 4) OU5, Operational Area Phase I Investigation Non-AOC Field Report, Vol. II, Final June 1995. (pages 18-20)

PREPARED BY:

Gary L. Coons, Member of EG&G Technical Staff

**PRS 330
(SUPPLEMENTAL DATA)**

CONTAMINATION:

In February 1996, the *Soil Gas Confirmation Investigation*⁵ was conducted. This investigation was a quantitative survey performed as the second phase to the original 1994 OU5, Operational Area Phase 1 qualitative PETREX Soil Gas Investigation. This survey sampled the PETREX soil gas locations with the highest ion counts in the western sector of the Mound plant. PETREX locations with the highest ion counts were #1015, #1066 and #1093 correspond to *Soil Gas Confirmation* samples #7, #11 and #18.

PRS 330 was not sampled as part of this investigation. However, PRS 330 had lower ion counts than the sampled locations with the highest ion counts. Hence, the *Soil Gas Confirmation* results for the PETREX locations with the highest counts in Mound's western sector (samples #7, 11 and 18) provide correlating evidence about the risk of contamination at other western sector locations with similar or lower ion counts (i.e. PRS 330). The map on page 25 shows PRS 330 as well as the *Soil Gas Confirmation* sample locations.

The following table lists both the maximum qualitative PETREX ion counts in Mound's western sector and the corresponding quantitative *Soil Gas Confirmation* sampling results. The table also compares the results to the qualitative PETREX ion counts for PRS 330. The PETREX sample corresponding to PRS 330 is listed as sample no. 1056.

PETREX Soil Gas Contaminant Family	Maximum Ion Counts⁴	Confirm Sample #	Confirmation Sample Results that Exceed Guideline Criteria (GC)	Ion Counts at PRS 330	
Total Aromatic Hydrocarbons	21,843,639	(#18)	None	12,436,663	(# 1056)
Total Semivolatile Hydrocarbons	1,389,465	(#18)	None	10,089	(# 1056)
Total C5-C11 Petroleum Hydrocarbons	30,786,838	(#7)	None	20,643,468	(# 1056)
Total Halogenated Hydrocarbons	892,683	(#11)	None	6,304	(# 1056)

The correlations made above make no conclusions about individual contaminant concentrations at PRS 330 only that the overall health risk at PRS 330 is expected to be similar to or less than that of the PETREX locations with the highest measured ion counts.

SUPPLEMENTAL REFERENCES:

5) Soil Gas Confirmation Sampling, (Revision 0), May 1996. (pages 21-37)

**MOUND PLANT
PRS 330
FORMER TANK SITE – BUILDING 2 FUEL OIL TANK**

RECOMMENDATION:

PRS 330 is the site of a former underground storage tank located in the western sector of the original Mound plant. In 1994, qualitative hydrocarbon detections were found during the PETREX soil gas portion of the *OU5, Non Area of Concern* investigation. No radioactive or hazardous waste generating processes or activities are known to have occurred at PRS 330.

In 1996, the Soil Gas Confirmation Sampling effort sampled the locations with the highest ion counts (confirmation sample locations 7, 11, and 18) in the western sector and discovered no contamination above the 10^{-6} risk range. PRS 330 was not sampled as part of the Soil Gas Confirmation Sampling but the PRS had lower ion counts than confirmation sample locations 7, 11, and 18. This implies that PRS 330 has similar or lower health risk than confirmation sample locations 7, 11, and 18.

All radiological samples collected near this PRS indicate that radionuclides are below their applicable 10^{-6} Risk Based Guideline Values, ALARA or regulatory levels. Therefore, NO FURTHER ASSESSMENT is recommended for PRS 330.

CONCURRENCE:

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

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

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

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from _____ to _____

- No comments were received during the comment period.
- Comment responses can be found on page _____ of this package.

REFERENCE MATERIAL
PRS 330

Environmental Restoration Program

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

**MOUND PLANT
MIAMISBURG, OHIO**

December 1994

Final

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



EG&G Mound Applied Technologies

Description of History and Nature of Waste Handling						Hazardous Conditions and Incidents			Environmental Data		
No.	Site Name	Location	Status	Potential Hazardous Substances	Ref	Releases	Media	Ref	Analytes ^a	Results	Ref
321	Dayton Unit II	Dayton	Historical	Explosives (including ammonium picrate and ammonium nitrate) Rocket propellant	1, 4	None Suspected			No Data		
322	Dayton Unit III	Dayton	Historical	Polonium-210, Tellurium, Bismuth, Cobalt, Nickel, Beryllium, Thorium	1, 4	Suspected Cobalt-60	S	4	No Data		
323	Dayton Unit IV	Dayton	Historical	Contaminants listed under Dayton Unit III	1, 4	Suspected Cobalt-60	S	4	No Data		
324	Dayton Warehouse	Dayton	Historical	Polonium-210	4	None Suspected			No Data		
325	Scioto Facility (Marlon)	Scioto	Historical	Facility never used	4	None Suspected			No Data		
326	Building 38 Sanitary Sump (Tank 254)	G-9	In Service	Sanitary wastewater	25	None Suspected			No Data		
327	R-111 Calorimetry Bath (Tank 255)	E-6	Inactive	Deionized water with potential alpha contamination	25	None Suspected			No Data		
328	R-111 Calorimetry Bath (Tank 266)										
329	Building 62 Hot Waste Sump (Tank 258)	E-6	In Service	Sanitary wastewater with potential alpha contamination	25	None Suspected Tank removed			No Data		
330	Building 2 Fuel Oil Tank (Tank 280)	H-7	Historical	Fuel oil	25	Unknown			No Data		
331	Building 2 Tank (Tank 261)	H-7	Historical	Sanitary Wastes	25	Unknown Closed in place			No Data		
332	Building G Waste Oil Tank (Tank 262)	E-7	Inactive	Waste oils	25	Unknown			No Data		
333	Building 87 Explosive Surge Tank (Tank 263)	H-7	In Service	Exhaust air from explosives testing	25	None Suspected			No Data		
334	Building 87 Explosive Surge Tank (Tank 264)										
335	Building 87 Explosive Surge Tank (Tank 265)										

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

Reference List

1. DOE 1986 "Phase I Installation Assessment Mound (DRAFT)."
2. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
3. DOE 1992c "Mound Plant Underground Storage Tank Program Plan & Regulatory Status Review (Final)."
4. DOE 1993a "Site Scoping Report: Volume 7 - Waste Management (Final)."
5. EPA 1988a "Preliminary Review/Visual Site Inspection for RCRA Facility Assessment of Mound Plant."
6. DOE 1993d "Operable Unit 9, Site Scoping Report: Volume 3 - Radiological Site Survey (Final)."
7. DOE 1993c "Operable Unit 3, Miscellaneous Sites Limited Field Investigation Report."
8. DOE 1992d "Reconnaissance Sampling Report Decontamination & Decommissioning Areas, OUG, (Final)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scoping Report: Volume 11 - Spills and Response Actions (Final)."
11. Styron and Meyer 1981 "Potable Water Standards Project: Final Report."
12. DOE 1993b "Reconnaissance Sampling Report - Soil Gas Survey & Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (Final)."
13. DOE 1993d "Operable Unit 9, Site Scoping Report: Volume 3 - Radiological Site Survey (Final)."
14. DOE 1991b "Main Hill Seeps, Operable Unit 2, On-Scene Coordinator Report for CERCLA Section 104 Remedial Action, West Powerhouse PCB Site."
15. Halford 1990 "Results of South Pond Sampling."
16. DOE 1993e "Operable Unit 4, Special Canal Sampling Report, Miami Erie Canal."
17. DOE 1990 "Preliminary Results of Reconnaissance Magnetic Survey of Mound Plant Areas 2, 6, 7, and C."
18. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
19. Rogers 1975 "Mound Laboratory Environmental Plutonium Study, 1974."
20. DOE 1992h "Ground Water and Seep Water Quality Data Report Through First Quarter, FY92."
21. Dames and Moore 1976 a, b "Potable Water Standards Project Mound Laboratory" and "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory."
22. DOE 1992i "Closure Report, Building 34 - Aviation Fuel Storage Tank."
23. DOE 1992j "Closure Report, Building 51 - Waste Storage Tank."
24. DOE 1994 "Operable Unit 1, Remedial Investigation Report."
25. EG&G 1994 "Active Underground Storage Tank Plan."



Revised Draft

***Active Underground Storage
Tank Plan***

May 16, 1994

Prepared for:

**Project Management and Planning
EG&G Mound Applied Technologies
One Mound Road
Miamisburg, Ohio**

DAMES & MOORE - INSPECTION & DOCUMENT REVIEW NOTES

CLIENT EG&G Mound Applied Technologies		JOB NUMBER 10805-794	DATE 4/21/94	
JOB TITLE Active Underground Storage Tank Program		D&M TEAM Grantelli & DiSpirito		
TANK NO. 260	BLDG LOCATION 2	EG&G SPONSOR ^{Proposed} D&D ER	OWNER U.S. DOE	
TANK STATUS Removed	TANK CAPACITY (gallons) 1000	INSTALLATION DATE 1956	INTERVIEWED WITH Cloud	INTERVIEW DATE 2/23/94

TANK DESCRIPTION, Purpose of Tank *fuel oil tank used to supply the Mechanical Equipment Room in Test fuel bldg no 2*

Tank Material <input checked="" type="checkbox"/> Bare Steel (unprotected) <input type="checkbox"/> Composite (steel & FRP) <input type="checkbox"/> Fiberglass Reinforced Plastic <input type="checkbox"/> Stainless Steel Lined Concrete <input type="checkbox"/> Steel Lined Concrete <input type="checkbox"/> Concrete <input checked="" type="checkbox"/> Other - Specify <i>steel with external bitumen coating</i> <input type="checkbox"/> Unknown	Tank Cathodic Protection <input type="checkbox"/> Internal Lining - Specify <input type="checkbox"/> Sacrificial Anodes <input type="checkbox"/> Impressed Current <input type="checkbox"/> Composite (Steel & FRP) <input checked="" type="checkbox"/> Other - Specify <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> None External Bitumen Coating	Inlet of Tank <i>fill point</i> Outlet of Tank <i>Test fuel building No 2 - Mechanical Equipment Room</i>	History of Spills <input type="checkbox"/> No Spill/Overfill Prevention <input type="checkbox"/> Float Vent Valve <input type="checkbox"/> High Level Alarm <input type="checkbox"/> Auto Shutoff <input type="checkbox"/> Other - Specify <input type="checkbox"/> None <i>N/A</i>
---	--	--	---

Piping Material <input type="checkbox"/> Cathodically Protected Steel <input type="checkbox"/> Bare Steel (unprotected) <input type="checkbox"/> Fiberglass Reinforced Plastic <input type="checkbox"/> Double Walled or Jacketed <input checked="" type="checkbox"/> Other - Specify <input type="checkbox"/> Unknown <i>Copper</i>	Substance Currently/Last Stored <input type="checkbox"/> Gasoline <input type="checkbox"/> Diesel <input type="checkbox"/> Kerosene <input type="checkbox"/> Used Oil <input type="checkbox"/> Hazardous Substances - Specify <input checked="" type="checkbox"/> Other - Specify <input type="checkbox"/> Unknown <i>No 2 Fuel Oil</i>	Tank Site Description <input type="checkbox"/> Indoor <input checked="" type="checkbox"/> Outdoor <input type="checkbox"/> Soil <input type="checkbox"/> Asphalt/Concrete <input type="checkbox"/> Storm Drains, Potential Surface water runoff <input type="checkbox"/> Soil Staining	DOE / AEC / PM No: <i>N/A</i> Calibration Records Maintenance Records
--	--	---	---

Tank Release Detection Method <input type="checkbox"/> Inventory Control <input type="checkbox"/> Manual Tank Gauging <input type="checkbox"/> Tank Tightness Testing <input type="checkbox"/> Automatic In-Tank Monitor & Inventory Control <input type="checkbox"/> Vapor Monitoring <input type="checkbox"/> Groundwater Monitoring <input type="checkbox"/> Secondary Containment with Interstitial Monitoring <input type="checkbox"/> Other - Specify <input type="checkbox"/> None <i>NA</i>	Piping Release Detection Method <input type="checkbox"/> Pressure Piping Automatic Line Flow Restrictor <input type="checkbox"/> Pressure Piping Automatic Line Shutoff Device <input type="checkbox"/> Line Tightness Test (Pressure Annual, Suction Every 3 yrs) <input type="checkbox"/> Vapor Monitoring <input type="checkbox"/> Groundwater Monitoring <input type="checkbox"/> Approved Suction Piping <input type="checkbox"/> Other - Specify <input type="checkbox"/> None <i>NA</i>	Closure Date of Last use <i>1968</i> Intended Replacement <i>Removed</i> Closure Plan <i>None</i> Part of Operable Unit <i>not assigned</i>	Primary Regulatory Jurisdiction <i>FFA</i> Spill Jurisdiction <i>FFA</i> Regulated Units
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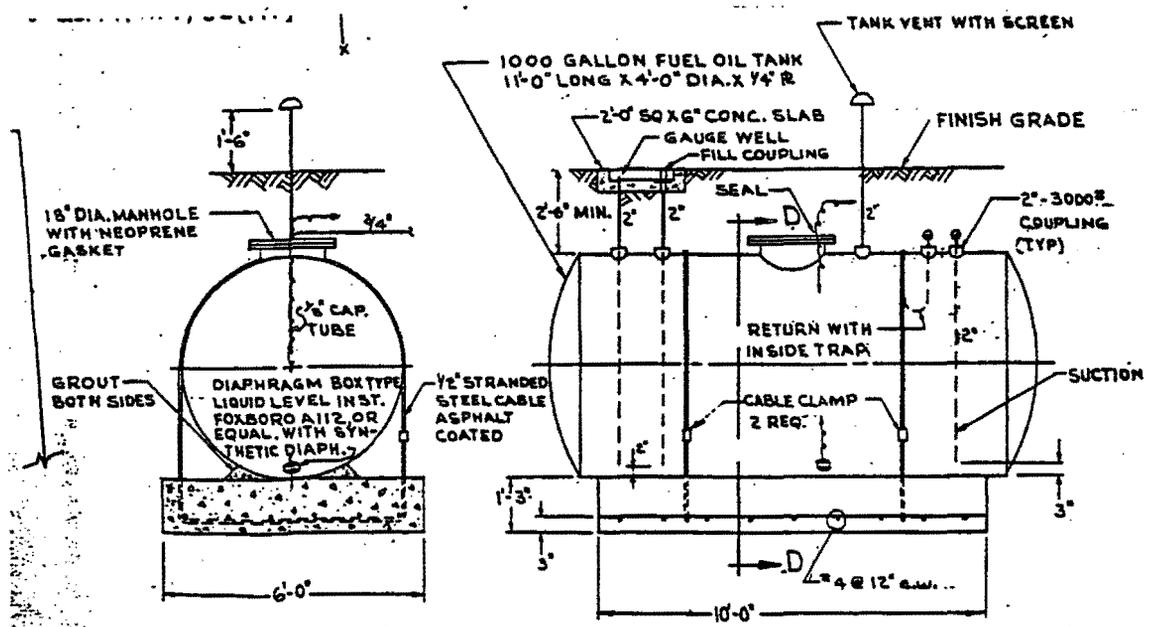
DOCUMENTS, REFERENCES USED: *Drawing No 063-M-9; UST Inspection Sheet*

COMMENTS:

SIGNATURE *RSE*

CLIENT EG&G Mound Applied Technologies		JOB NUMBER 10805-794	DATE 4/21/94	
JOB TITLE Active Underground Storage Tank Program		D&M TEAM Grantelli & DiSpirito		
TANK NO. 260	BLDG LOCATION 2	EG&G SPONSOR ER - Proposed	OWNER U.S. DOE	
TANK STATUS Removed	TANK CAPACITY (gallons) 1,000	INSTALLATION DATE 1956	INTERVIEWED WITH Cloud	INTERVIEW DATE 2/23/94

SKETCH OF TANK/TANK SYSTEM:



SECTION "D-D"
SCALE 1/8" = 1'-0"

PITCH ALL HORIZONTAL TANK CONNECTIONS TO DRAIN BACK TO TANK

INSTALLATION DETAIL - FUEL OIL TANK - 1000 GAL

COMMENTS:

SIGNATURE

Adley

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

pCi/g, and 5.23 nCi/l, respectively. Seven coreholes and four surface samples (C0008, C0009, C0020, C0015, C0024, C0025, C0032 and S0276, S0278, S0299 and S0316, respectively; Table III.5) were analyzed for cobalt-60. All analyses indicate that nothing above the LDL was encountered.

The core locations in Area 7 were drilled and sampled to maximum depths of 96 to 234 inches (8 to 19.5 ft). Mound Plant drawing #FSE16472, reproduced in the Site Scoping Report: Volume 2 Addendum (DOE 1992f) indicates the depth to bedrock in this area is 9 to 15 ft at the north end of the area, and to 65 ft at the southern end near Building 51. Because a boring log is available for only one of the Area 7 locations, it is not known if bedrock was encountered during the drilling; however, it appears that the majority of the core sampling did not penetrate fill and reach the original disposal area.

3.7. AREA 10

Area 10 is located on the slope of the SM/PP Hill, adjacent to Area 12 (Plate 1). Area 10 contains concrete and debris contaminated with polonium-210 from the 1949 and 1950 demolition of the old Dayton operations (DOE 1992g). The debris was covered over with a layer of dirt. With a half-life of 138.4 days, the polonium-210 is no longer present due to radioactive decay. The actual size of the area affected by the debris disposal is unknown so the area depicted on Plate 1 should be viewed as schematic.

One surface sample was collected in Area 10 during the Site Survey Project, sample S0604 (Plate 1; Table III.6). This sample contained 11.8 pCi/g of plutonium-238, and less than 2 pCi/g of thorium. It is not known where this sample was collected in relation to the debris. No analyses are known for gamma spectroscopy that would have detected cobalt-60 or perhaps bismuth-207.

Because of its location on the slope of the SM/PP Hill, Area 10 is in a position to receive surface water runoff from areas upgradient, such as the adjacent Area 12. Since there are no other known contaminants associated with the concrete, it is believed that the plutonium-238 detected in the surface sample is the result of deposition from surface water runoff. The original Site Survey Project Report notes that more recent D&D Program core sampling in Area 10 indicated one sample with a plutonium-238 concentration between 10 and 99 pCi/g.

3.8. AREA 13

Area 13 is located near Building 49 in the valley between the Main and SM/PP Hills at Mound Plant. In 1950, wood contaminated with polonium-210 from the demolition of the Dayton operations was stored in this area along with equipment stored in tents. The wood, tents and other debris was burned in Area 13 in 1955 (DOE 1992g). Metal and other residual materials that survived the fire were subsequently buried in the historic landfill (Area 2). With a half-life of 138.4 days, the polonium-210

is no longer present due to radioactive decay. The exact location of Area 13 is not exactly known. The locations depicted on Plate 1 indicate the general locations and display the different variations published in various documents. The map of Hot Waste Burial Sites, reproduced in the Site Scoping Report: Volume 7 - Waste Management (DOE 1992g) depicted Area 13 to the far east of Building 49. The Site Survey Project Report (Stought et al. 1988) depicted Area 13 slightly farther west and overlapping Building 49. Evaluation of the historic relationships of the Quonset hut and other historic buildings in the area indicate the actual location was even farther west as shown by the dashed square on Plate 1. The Quonset hut was also moved from the Dayton units to the lower part of the plant valley and is described in the companion reactor waste decontamination subsection 9.3 of this report.

Two surface samples were taken in or near the reported location of Area 13 during the Site Survey Project. These locations are S0670 and S0671 (Plate 1; Table III.7). Plutonium-238 was detected at 0.34 and 5.74 pCi/g, respectively (Table III.7). No thorium was detected above 2 pCi/g in these samples. Area 13, like Area 10, is in a position to receive surface water runoff from areas upgradient on the SM/PP Hill, including Area 12, which contains plutonium contamination (subsection 3.1.12). It is believed that the plutonium present in the samples taken in Area 13 may be the result of surface water runoff and not the result of the polonium-contaminated wood placed in the area. No analyses for gamma spectroscopy are known for Area 13.

3.9. AREA 20

Area 20 is located on the southern slope of the Main Hill, just west of the HH Building (Plate 1). In the 1950s, an underground radioactive waste line in this area is reported to have ruptured, releasing polonium-210 and cobalt-60 to the soils in the area. At least two separate incidents are known (DOE 1992c). The aerial survey conducted in 1976 indicated gamma exposure levels of 4.5 to 7.5 μ R/hr in Area 20 (EG&G 1978). During construction activities in 1985, radioactively contaminated soils from Area 20 were reportedly excavated and moved to Area 22. The old wasteline remains in place today.

Table III.8 presents the results of the Site Survey Project sampling in Area 20. The sampling locations are shown in Plate 1. No plutonium-238 or thorium results were given for the core locations sampled. Cesium-137 was detected at 1 pCi/g in the surface sample collected from core location 0070 (C0070 on Table III.8). Radium-226 was the only other radionuclide detected in the samples collected from the other core locations.

The samples from the surface locations in Area 20 were analyzed for plutonium-238 and thorium. The maximum concentrations detected were 1.9 and 4.02 pCi/g for plutonium-238 and thorium, respectively. Both of these concentrations were detected in samples collected from surface location 0406 (S0406, Table III.8).

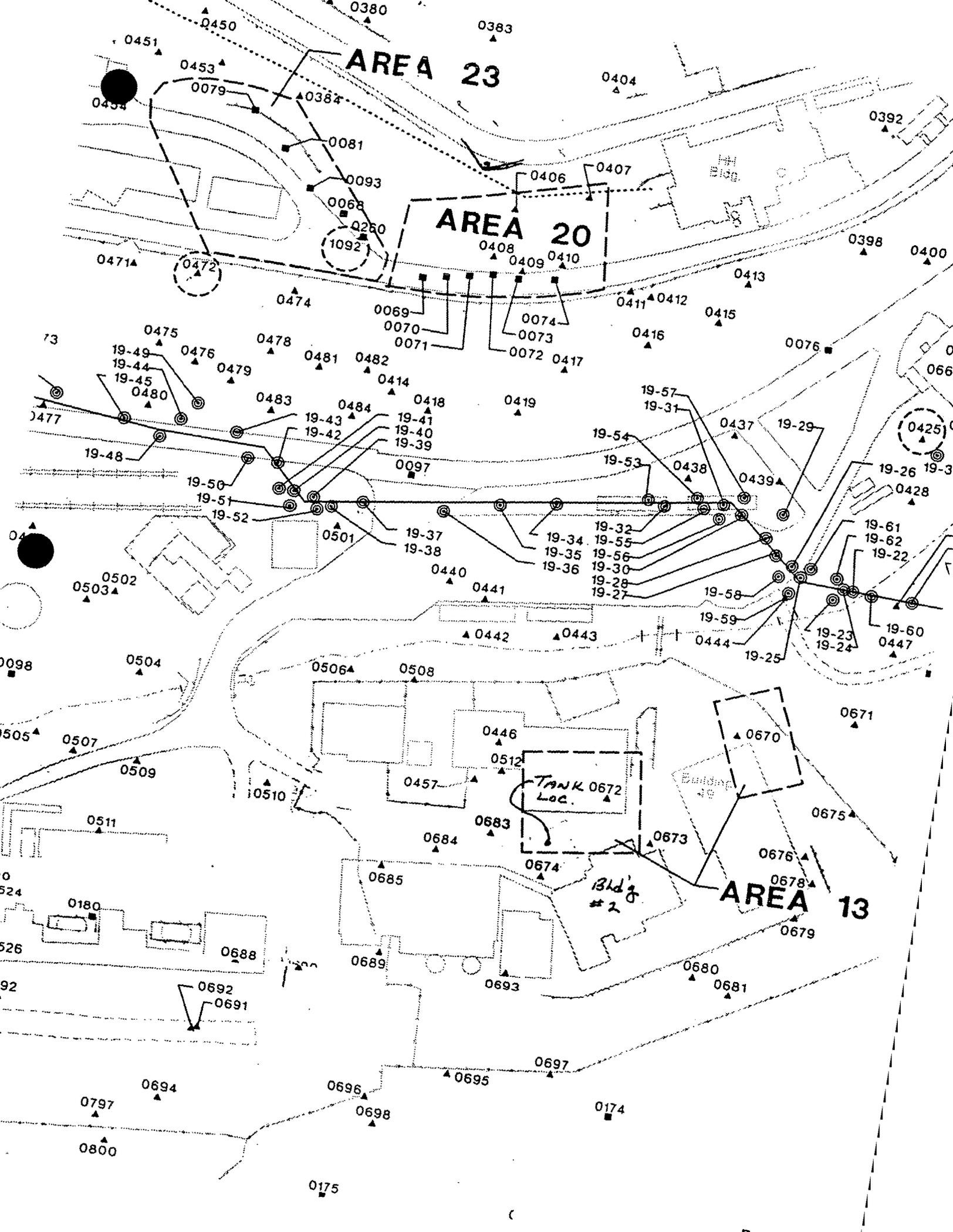


Table III.7. Mound Site Survey Project - Area 13

Plate 1 <u>Location^a</u>	Coordinates		MRC ID		Depth <u>(inch)</u>	Plutonium-238 <u>(pCi/g)</u>	Thorium ^b <u>(pCi/g)</u>
	<u>South</u>	<u>West</u>	<u>No.</u>	<u>Mo-Yr</u>			
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
→ S0674	2775	3375	4028	10-83	0	0.54	b

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

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

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

MRC ID - Monsanto Research Corporation Identification

pCi/g - picocuries per gram

RADIOCHEMICAL ANALYSIS

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

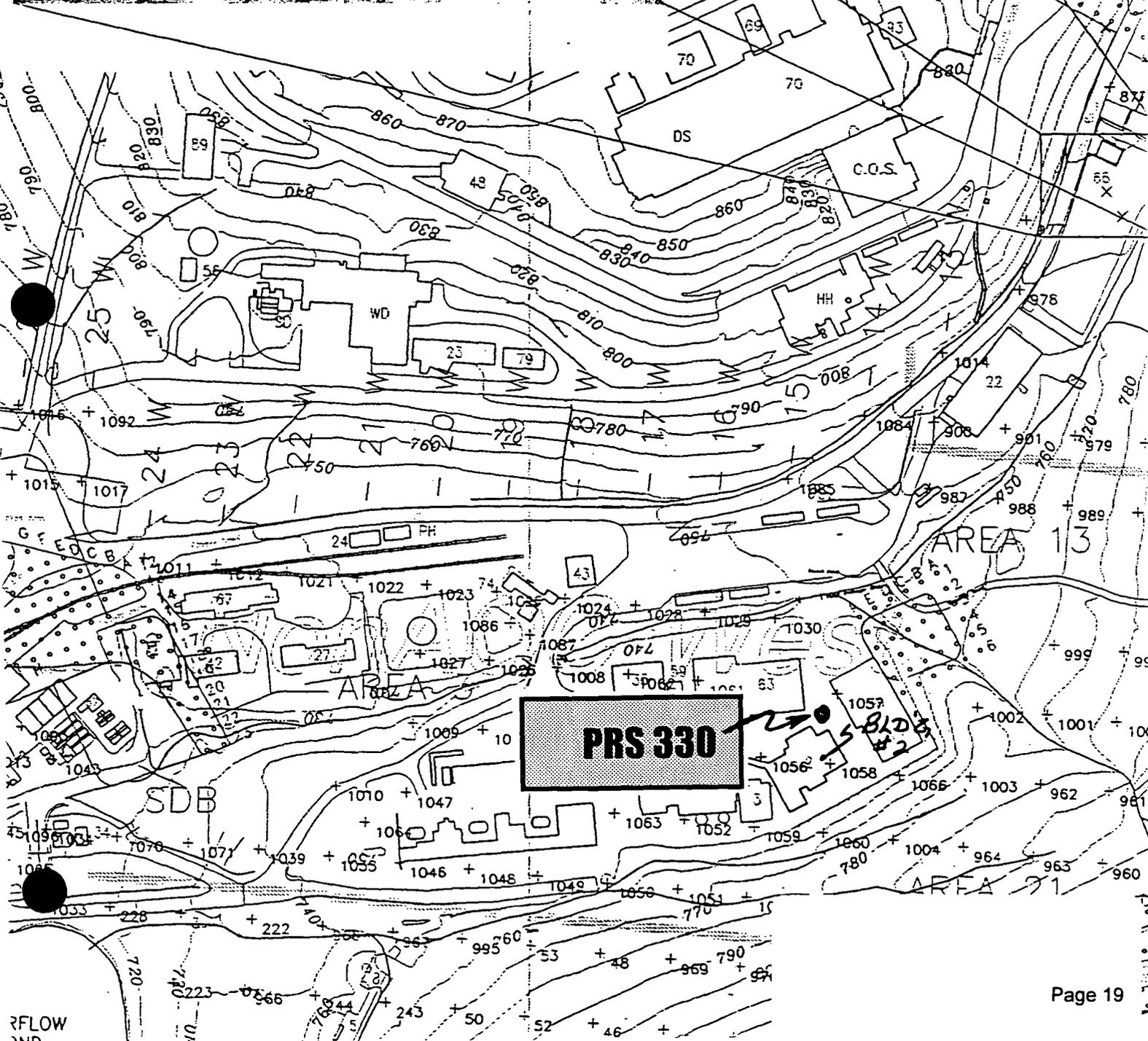
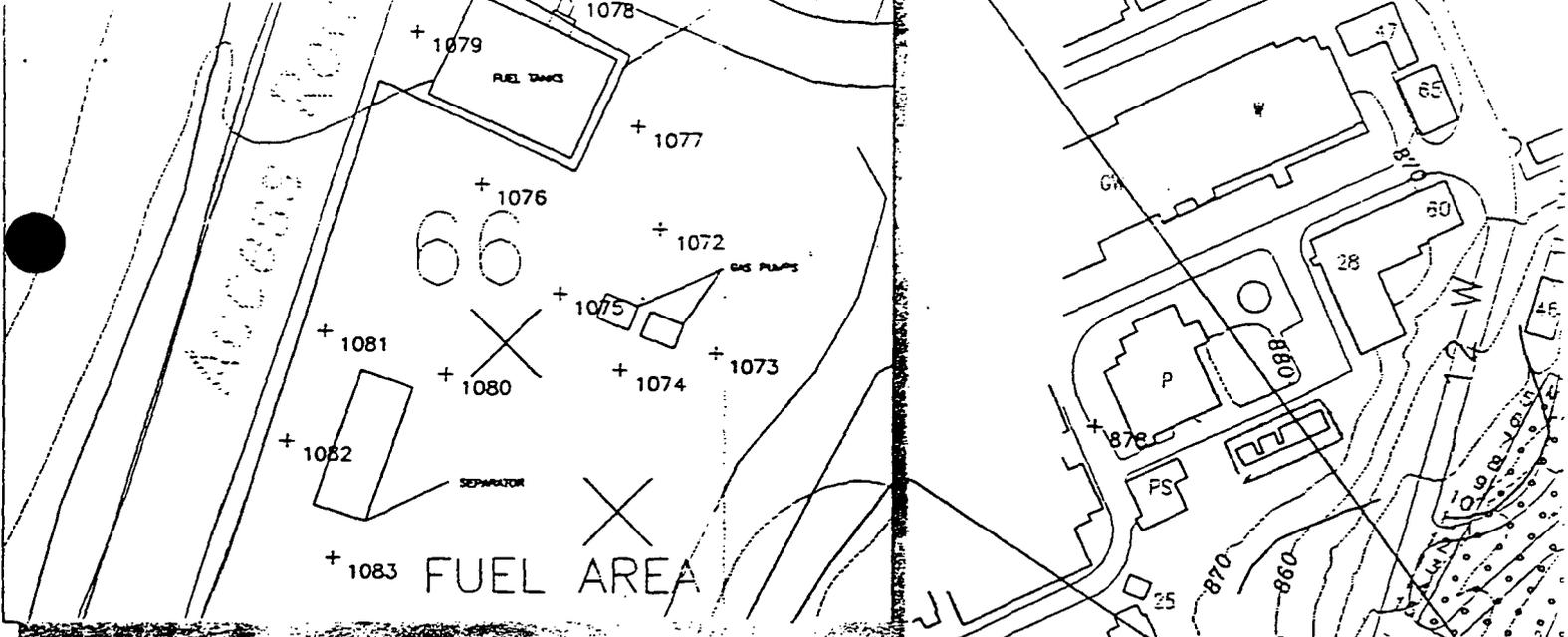


Table 2 (cont'd)

Sample #	Total Aromatic Hydrocarbons (a)	Total Semivolatile Hydrocarbons (b)	Total C5 to C11 Petroleum Hydrocarbons (c)	Total Halogenated Hydrocarbons (d)
1035	2,087,712	208,961	4,036,897	H
1039	546,090	9,996	741,506	ND
3039 (e)	516,065	21,227	733,093	ND
1040	169,260	960	370,073	3,677
1041	161,457	27,579	414,156	ND
1043	13,388,803	35,887	22,611,601	37,483
1044	107,749	ND	197,715	ND
1045	285,417	ND	566,535	4,393
1046	1,405,580	4,890	1,861,211	ND
1047	12,522	ND	25,068	ND
1048	2,994,722	617	3,566,067	ND
1049	148,446	ND	261,085	ND
1050	435,979	ND	1,290,385	ND
1051	66,445	2,646	107,123	ND
3051 (e)	64,919	752	112,256	ND
1052	351,489	ND	934,775	ND
1053	8,013	1,173	23,389	ND
1054	291,951	ND	669,428	ND
1055	678,469	ND	1,033,700	ND
1056	12,436,663	10,089	20,643,468	6,304
3056 (e)	12,445,999	13,823	21,137,796	8,479

Key: (a) Intensity of response to ions of atomic masses 78, 92, 106, 120, 134, 148, 162, 176, 190, and 204.

(b) Intensity of response to ions of atomic masses 128, 142, 153, 156, 178, 184, 198, 202, and 212.

(c) Intensity of response to ions of atomic masses 70, 72, 78, 84, 86, 92, 98, 100, 106, 110, 112, 114, 120, 124, 126, 128, 134, 138, 140, 142, 148, 152, 154, and 156.

(d) Intensity of response to ions of atomic masses 101, 130, 146, 151, and 164.

(e) Duplicate of preceding sample.

H High levels of petroleum hydrocarbons have interfered with the identification of halogenated hydrocarbons in this sample; see text.

T High levels of terpenes have interfered with the identification of petroleum hydrocarbons in this sample; see text.

ND The targeted compounds were not detected in this sample.

* Travel Blank

PETREX DATA (RELATIVE)

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	Dimethylphthalate	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-Ghloronaphthalene	2,6-Dinitrotoluene	N-Nitroso-di-n-propylamine
2-Chlorophenol	Fluoranthene	N-Nitroso-diphenylamine
4-Chlorophenyl-phenylether	Fluorene	2,2-oxybis(1-Chloropropane)
Pentachlorophenol	Pyrene	2,4,5-Trichlorobenzene
Phenanthrene	1,2,4-Trichlorobenzene	2,4,6-Trichlorobenzene
Phenol		

Table I.1 Soil Analyte List (Continued)

Pesticides/PCB's

Aroclor-1016	Delta-BHC	Endosulfan II
Aroclor-1221	Gamma-BHC	Endosulfan sulfate
Aroclor-1232	alpha-Chlordane	Endrin
Aroclor-1242	gamma-Chlordane	Endrin aldehyde
Aroclor-1248	4,4'-DDD	Endrin ketone
Aroclor-1254	4,4'-DDE	Heptachlor
Aroclor-1260	4,4'-DDT	Heptachlor epoxide
Aldrin	Dieldrin	Methoxychlor
Alpha-BHC	Endosulfan I	Toxaphene
Beta-BHC		

Inorganics

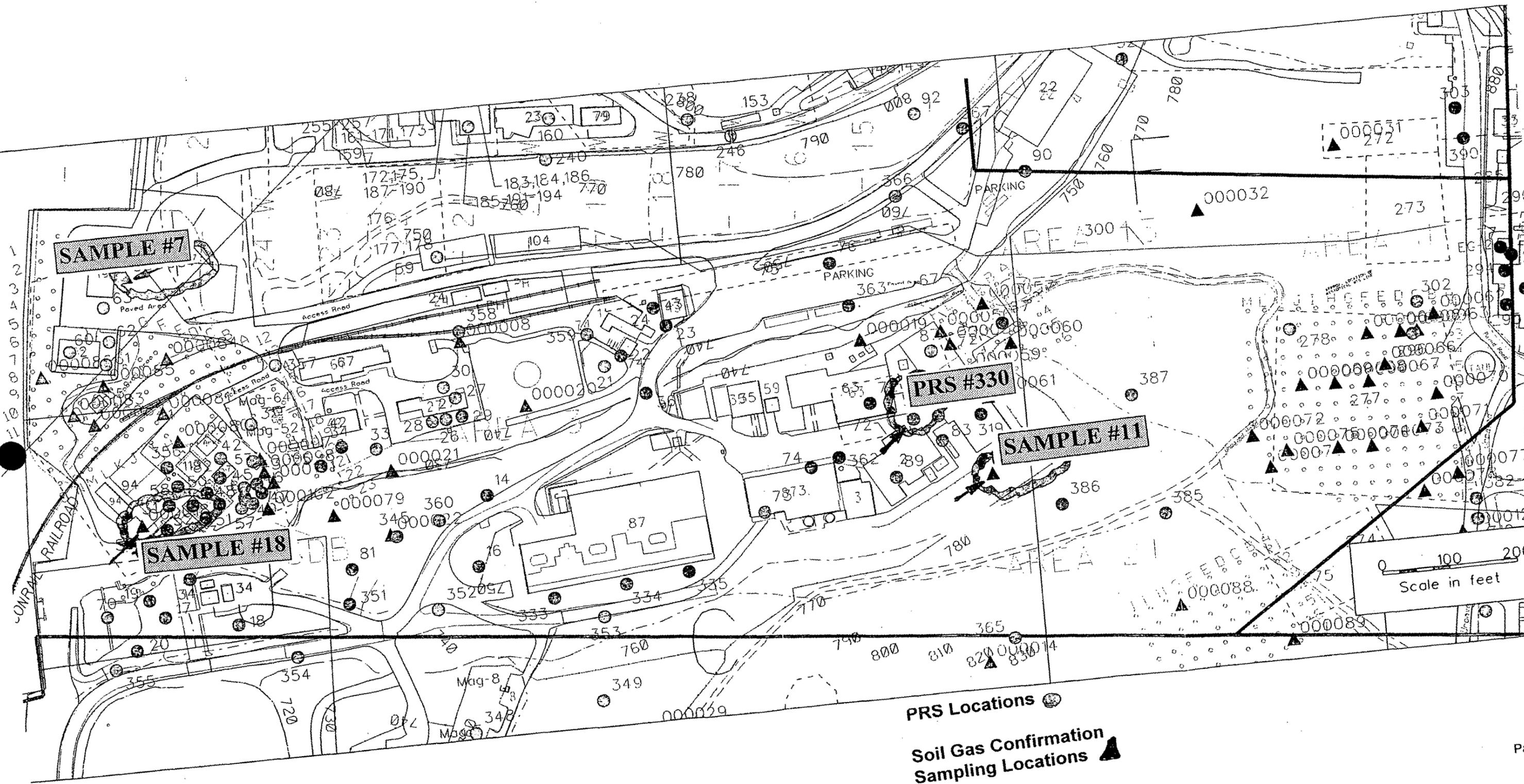
Aluminum	Copper	Potassium
Antimony	Cyanide	Selenium
Arsenic	Iron	Silver
Barium	Lead	Sodium
Beryllium	Lithium	Thallium
Bismuth	Magnesium	Tin
Cadmium	Manganese	Vanadium
Calcium	Mercury	Zinc
Chromium	Molybdenum	Nitrate/Nitrite
Cobalt	Nickel	Explosives (USATHAMA,PETN)

Radionuclides

Americium-241	Plutonium-238	Thorium-230
Bismuth-207	Plutonium-239/240	Thorium-232
Bismuth-210	Potassium-40	Uranium-234
Cesium-137	Radium-226	Uranium-235
Cobalt-60	Thorium-228	Uranium-238

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

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



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-00007	SGC-NAC-00010	SGC-NAC-00011	SGC-NAC-00012	SGC-NAC-00013
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		180 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		48 J	
Bis(2-ethylhexyl)phthalate	NA	215,000	71 J		38 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	26 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-	SGC-NAC-	SGC-NAC-	SGC-A66-
			000008	000010	000031	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	000002	000003	000004	000005	000006	000007	000008	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	88.4	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		0.38 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	8.7	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	67800	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	18.1	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	85	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	6.2	6	4.8	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	28	NA	17.4	16.6	21.3 J	13.5 J	22.4	12.2	19.3	28.9
Cyanide	ND	4,300					1.8		1	
Iron	35000	NA	17300	25600	27900	21100	36300	16800	26600	40000
Lead	48	NA	16.5	5.7	9.3 J	29.4 J	12.9	14.3	14.1	27.5
Lithium	28	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	0.78 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	0.48	NA								
Tin	20	NA			1.8 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	80.1	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 blank 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	18000	NA	5130	7820	13400	7720	8030	12200	5410	6830
Antimony	NA	85					0.68 B			
Arsenic	8.8	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	58.1	17.9 B	24.2 B	65.8 J	80.3	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	78400	84400	58300	42200	35400 J	210000 J	162000 J
Chromium	20	110,000	9.3	8.9	18.6	13.9	14.4 J	18.2	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	28	NA	11.8	14.2	17.3	26.5	28.3 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	18.4 J	5.2 J	6.9 J
Lithium	28	NA	18.1 B	9.7 B	38.5	25.8	15.3 B	18.8 B	12.8 B	18.3 B
Magnesium	40000	NA	47700	28800	16300	15800	22000 J	4840	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	0.48	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	58.1	84.9	68.9	72.5 J	68.8	28.9	64.8
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	0.48				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)