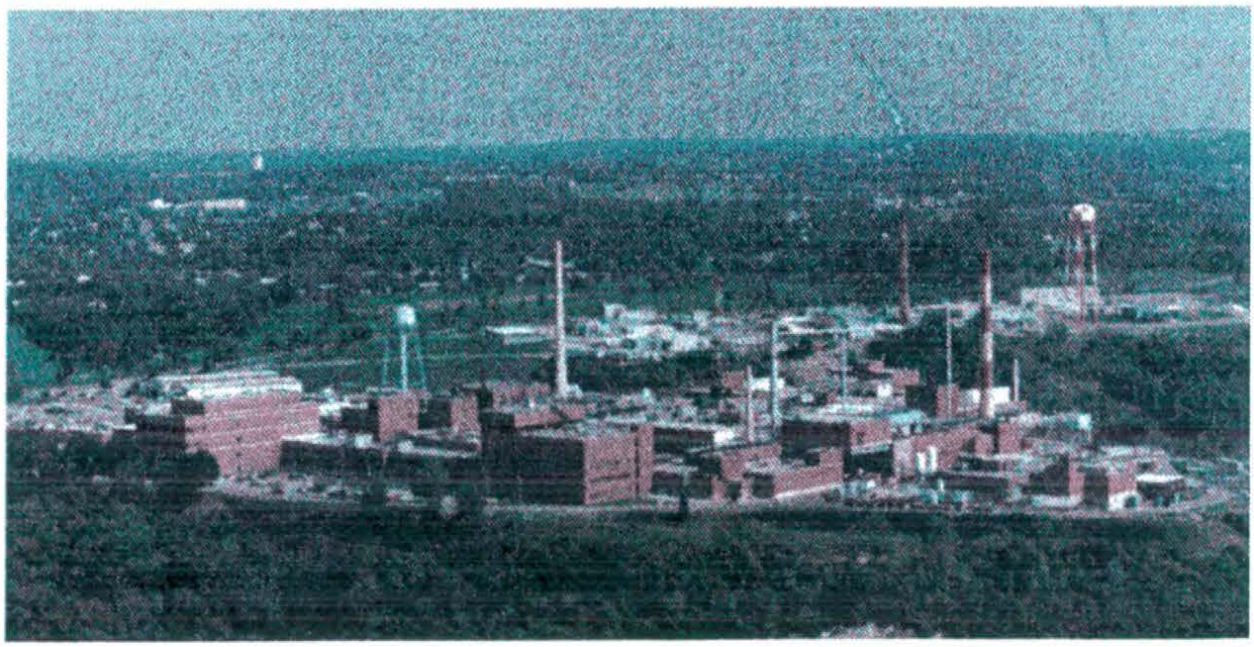
EG&G MOUND-30-03-03-03--9705080027

MOUND

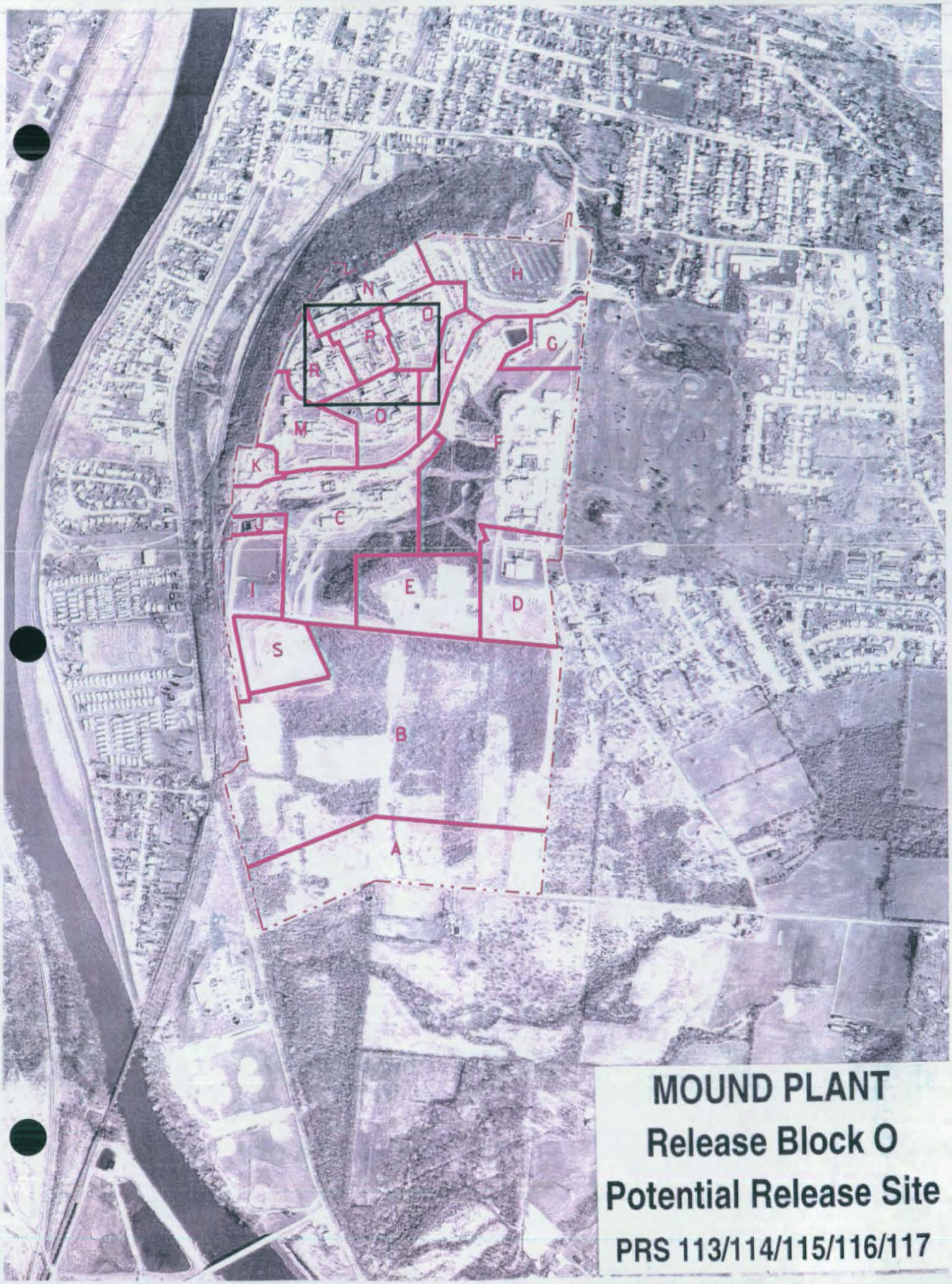
Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 113/114/115/116/117



PRS 113/114/115/116/117

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

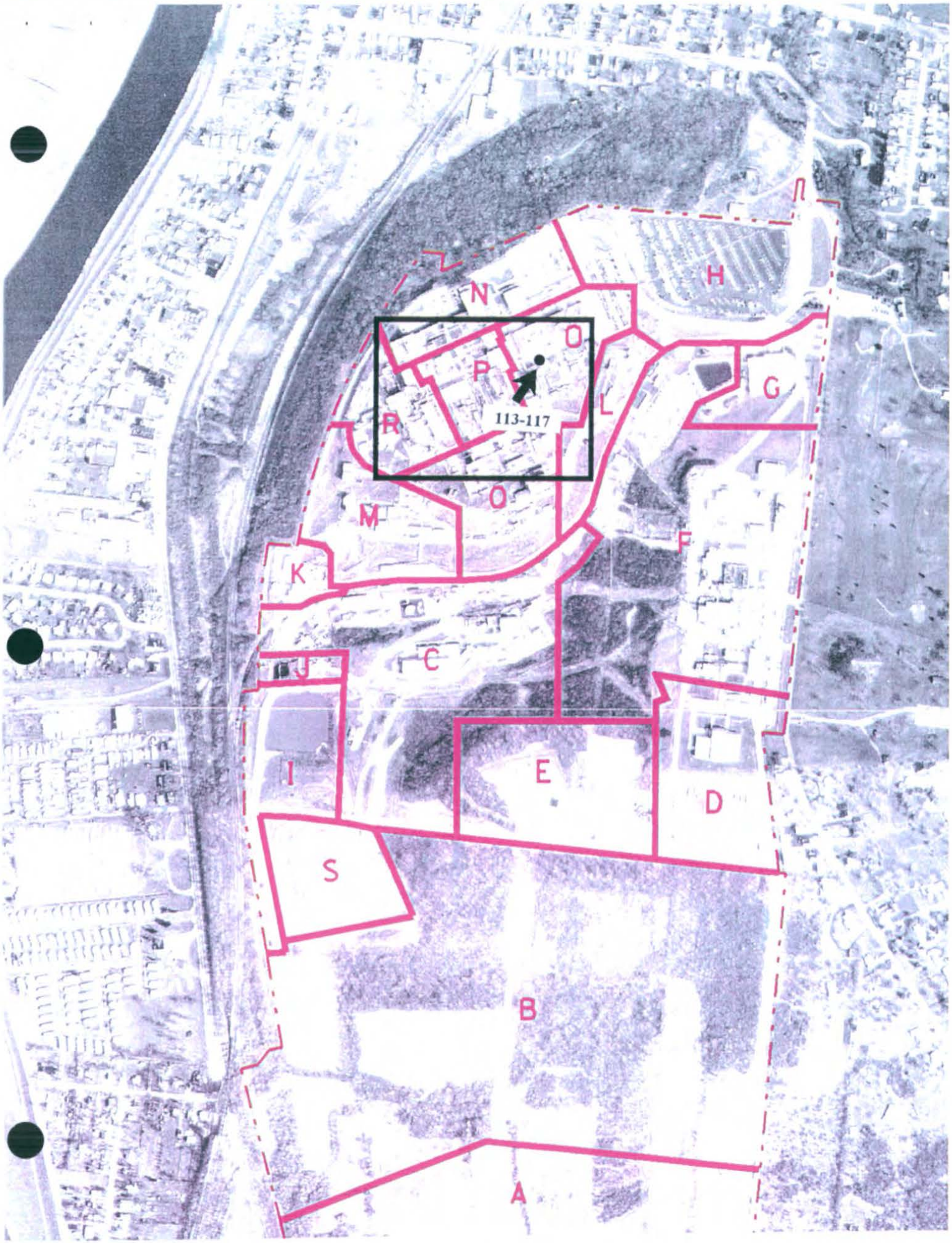


MOUND PLANT

Release Block O

Potential Release Site

PRS 113/114/115/116/117


N
O
P
113-117
R
L
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M
O
K
F
C
I
E
D
S
B
A

MOUND PLANT

Release Block O

Potential Release Site

PRS 113/114/115/ 116/117

114 115 116 117
113

PRS 113/114/115/116/117

PRS HISTORY:

Potential Release Sites (PRS) 113/114/115/116/117 were identified to address fuel oil and toluene contamination in the soil located on the east side of the powerhouse.[1]

PRSs 114-117 are the four underground fuel oil tanks which have been removed. Removal of the tanks and contaminated soils was initiated in 1995 and completed in 1996. The Fuel Oil Storage Removal Action (FOSRA)[5] documents the closure activities for these PRSs.

PRS 113 refers to the toluene contamination detected in the powerhouse soils area. This contamination was identified by a soil gas survey performed prior to the removal action mentioned above.

CONTAMINATION:

Investigations Prior to the Tank Removal

In 1992, five soil gas samples were collected from surface locations surrounding the powerhouse. Toluene contamination was detected in only one sample, location 1053.[2] The toluene concentration was 447 parts per billion (ppb), which is below the calculated guideline limit of 414,600 ppb for soil gas contamination.[4]

Seven samples from the powerhouse soils area have been analyzed for radioactivity.[3] A maximum soil concentration of 0.73 pCi/g plutonium-238 and $\leq$ 2 pCi/g thorium was measured. These levels are below the Mound limits for soil contamination: 25 pCi/g plutonium-238 (ALARA) and 5 pCi/g thorium (40 Code of Federal Regulations 192.41).

Removal (FOSRA) Investigations

The removal and remediation of the soil contaminated by these tanks will continue as planned by the FOSRA.[5] The removal will comply with standards defined by Ohio Bureau of Underground Tank Regulation (BUSTR) for petroleum contaminated soils, Ohio Administrative Code 1301:7-9-13 (E).

Analytical information for the first three tank removals is attached.[5, 6] In summary, the excavation of soil will lower the residual petroleum levels to below the BUSTR guideline (642 mg/kg) for Category 2 soils.[6] The removal of the four fuel tanks and the concentration of oil residuals remaining after site closure will be documented in the FOSRA - On Scene Coordinator Report.

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 6-9)
2) Reconnaissance Sampling Report - Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill, February 1993. (pages 10-13)
3) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 14-17)

OTHER REFERENCES:

4) Comparison of Actual Soil Gas Values with Calculated Acceptable Soil Gas Values, March 1996. (pages 18-20)
5) Removal Site Evaluation Action Memorandum - Fuel Oil Storage Removal Action (FOSRA) Draft, November 1995. (pages 21-63)
6) BUSTR Project File. (pages 64-92)

PREPARED BY:

David Gloekler, Member of EG&G Technical Staff

MOUND PLANT
PRS 113/114/115/116/117
FORMER TANK SITE - POWERHOUSE FUEL OIL STORAGE TANKS AND SOIL CONTAMINATION

RECOMMENDATION:

Potential Release Sites (PRSs) 113, 114, 115, 116, and 117 were identified to address fuel oil and toluene contamination in the soil located on the east side of the powerhouse.

PRSs 114-117 are the four underground fuel oil tanks that were removed. Removal of the tanks and contaminated soils was initiated in 1995 and completed in 1996. The treatment of the soils is ongoing in accordance with the Action Memorandum for the Fuel Oil Storage Removal Action (FOSRA). The On-Scene Coordinator (OSC) Report for the FOSRA will document residual levels and the requirements for this removal per the Ohio Bureau of Underground Tank Regulations (BUSTR).

PRS 113 refers to a single toluene soil gas detection prior to the removal activities. Toluene was identified at a concentration of 447 parts per billion (ppb), which is below the 414,800 ppb calculated acceptable soil gas concentration.

Therefore, since these PRSs are part of an active removal action, NO FURTHER ASSESSMENT is recommended.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath 3/18/97
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 3/18/97
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 3/18/97
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 113

ENVIRONMENTAL RESTORATION PROGRAM

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

MOUND PLANT
MIAMISBURG, OHIO

December 1994

U.S. DEPARTMENT OF ENERGY
OHIO FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

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
[redacted]	~~G Building Gasoline Tank~~ (Tank 204)	E-7	Historical	(Cont.)	(Cont.)	(Cont.)		(Cont.)	(Cont.)		
[redacted]	~~I Building Soils~~	E-6 F-6	Grounds	Toluene, acetone, Freon	4	Indicated by Soil Gas Survey	S	12	1 14, 16	SGS[b] Table B.4 Locations 1075, 1227, 1228 Table B.9 RSS Locations S0171, S0178, S0181, S0183, S0186, S0187, S0190, S0193, S0195, S0255 (Appendix E in Ref. 6)	12 6
[redacted]	~~Monitor Well 0034~~	F-7	Surplus	Waste oil	5, 18	Suspected	GW	5	No Data		
[redacted]	~~Paint Shop Area~~	E-7	In service	Paints, Thinners, Solvents (including toluene and methylene chloride) Lead, Chromates	1, 4, 5, 18	Suspected, confirmed lead	S	5	3, 4, 5, 6, 16	Tables B.6, B.7, B.8, and B.9	7
113	Powerhouse Soils	E-7	Grounds	Calcium chloride, magnesium chloride, zinc chromate, PCBs	4	Indicated by Soil Gas Survey	S	12	1 14, 16	SGS[b] Table B.4 Location 1052 Table B.9 RSS[c] Locations S0155, S0156, S0158, S0253 (Appendix E in Ref. 6)	12 6
114	Powerhouse Fuel Oil Storage Tank (Tank 113)	E-7	In service	Fuel oil	1, 3, 5, 7, 18	Fuel Oil, confirmed EPH	S	10, 7	3, 4, 5, 6, 8	Tables B.6, B.7, and B.8	7
115	Powerhouse Fuel Oil Storage Tank (Tank 114)										
116	Powerhouse Fuel Oil Storage Tank (Tank 115)										
117	Powerhouse Fuel Oil Storage Tank (Tank 116)										

Table B.9. Summary of Radiological Data[a,b]

Site Name	Radiological Contaminants															
	Potassium-40	Plutonium-239	Plutonium-238	Cesium-137	Thorium-Total	Tritium	Thorium-232	Cobalt-60	Radium-224, -226, -228	Radon-222	Americium-241	Actinium-227	Uranium-233, -234, -238	Bismuth-210m	Bismuth-207	Reference
79. Warehouse 15			0.52		<2		10.									6
80. Warehouse 15A			0.7				10.									6
85. Building 29 Solvent Storage Shed	NA	NA	0.29	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
86. Building 29 Septic Tank (Tank 224)				1.2					2.0			1,400				6
88. Tritium in Buried Valley Aquifer						20										11,18
90. Site Survey Project Potential Hot Spot Location S0425			1.08		5.74											6
91. Main Hill Seep 0601 (f)				10		1033		82								18
92. Main Hill Seep 0602 (f)						16.17										18
95. Main Hill Seep 0605 (f)						56.60										18
97. Main Hill Seep 0607 (f)						89.56										18
98. Main Hill Seep 0608 (f)						27.60										18
103. E Building Soils	NA	NA	0.25	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
106. G Builing Soils (AKA Garage Area)	NA	NA	0.68	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
110. I Building Soils	NA	NA	1.87	NA	<2	1.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
112. Paint Shop Area							ND									7
113. Powerhouse Soils	NA	NA	0.86	NA	<2	2.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
118. M Building Soils	NA	NA	0.62	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6

(a) - All units are reported in pCi/g unless otherwise noted.
(b) - Blank spaces implies not sampled.
(c) - Additional data on other analytes are available in reference 16.
(d) - Groundwater data. Unit of measure is pCi/L.
(e) - This site is the same as Site #19.
(f) - Groundwater data. Unit of measure is nCi/L.

LDL - Lower Detection Limit.
ND - Not detected.
NA - Not analzyed for.
NR - No result reported.

References:
6) DOE 1993d
7) DOE 1993c
11) Styron and Meyer 1981
13) DOE 1993d
18) DOE 1992a
24) DOE 1994

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, OU6, (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."

Environmental Restoration Program

RECONNAISSANCE SAMPLING REPORT SOIL GAS SURVEY AND GEOPHYSICAL INVESTIGATIONS, MOUND PLANT MAIN HILL AND SM/PP HILL

REPORT
APPENDICES A, B AND D

MOUND PLANT
MIAMISBURG, OHIO

February 1993

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

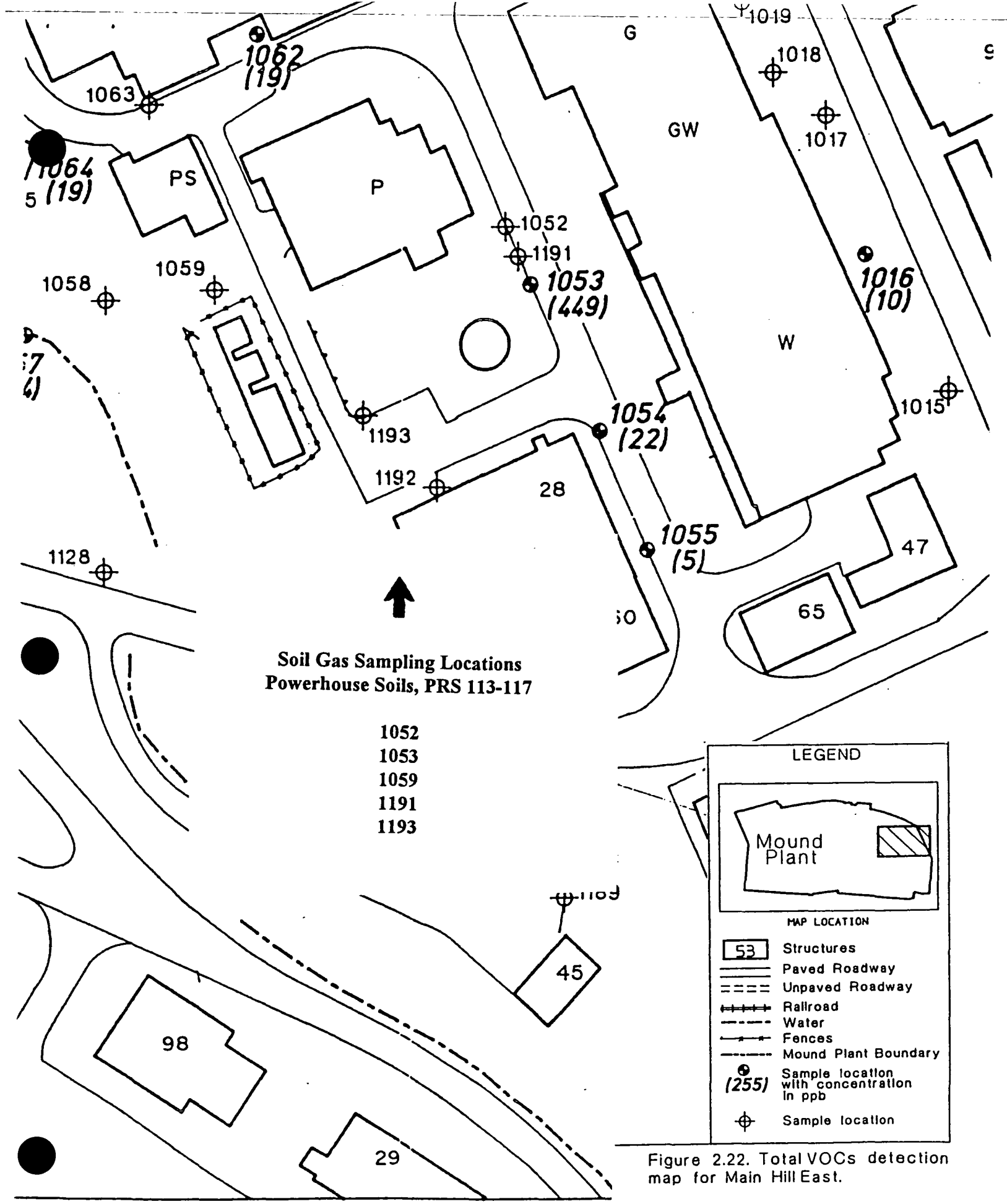


Figure 2.22. Total VOCs detection map for Main Hill East.

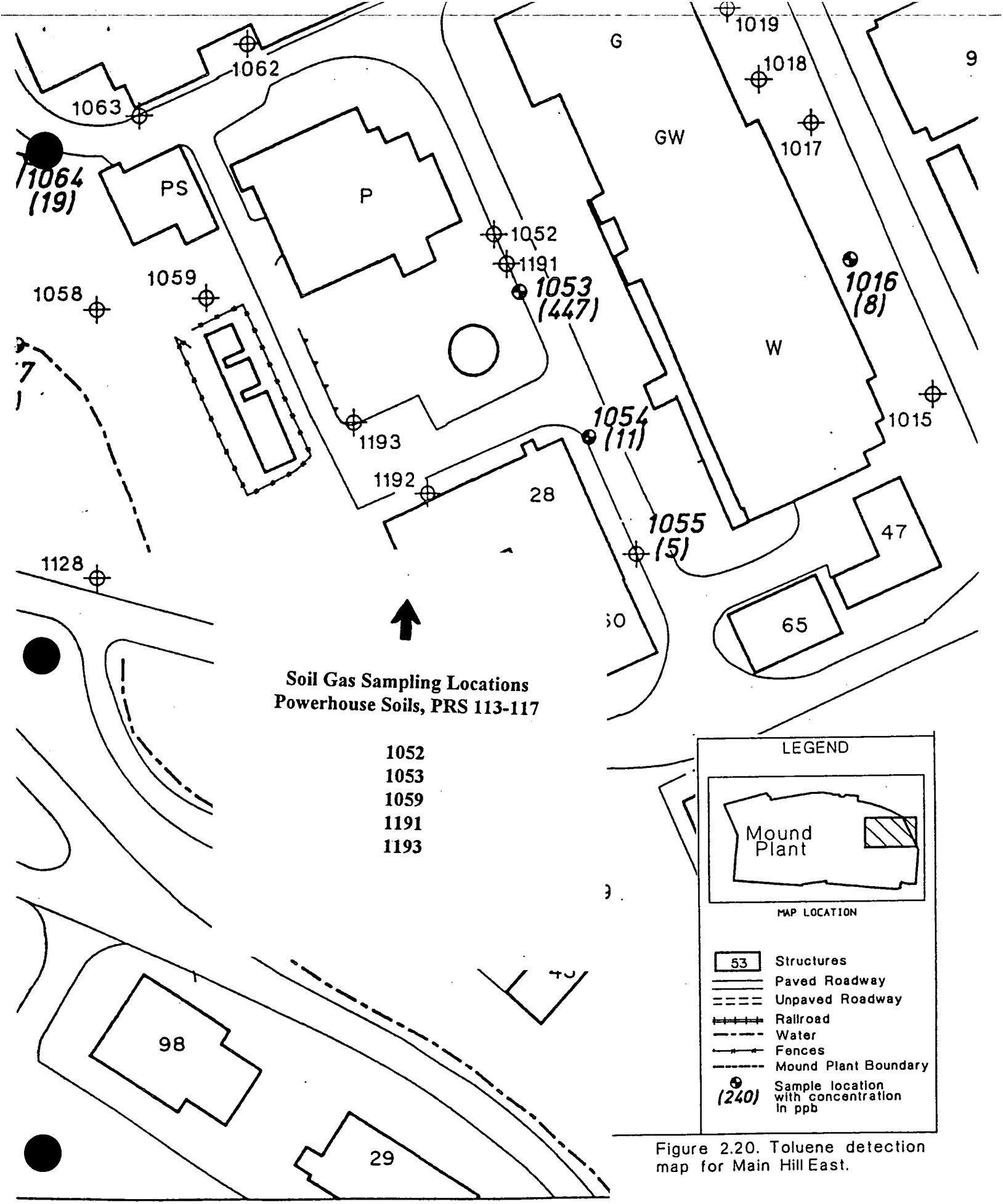


Figure 2.20. Toluene detection map for Main Hill East.

TABLE II.4. SUMMARY OF POSITIVE DETECTIONS–MAIN HILL
(ppb)

SOIL GAS DATA (ABSOLUTE)

SAMPLE ID	SAMPLE DATE	FREON 11	FREON 113	TRAN-12DCE	CIS-12DCE	111TCA	PCE	TCE	TOLUENE
MND-01-1002-1003	28 JUL 92	---	---	---	---	---	---	---	40
			---	---	---	---	---	---	3 *
			---	---	---	---	---	---	21 *
			---	---	---	---	---	2	---
			---	---	---	---	---	---	5
			---	---	---	---	---	---	3
			---	---	---	---	---	4	19
			---	---	---	---	---	---	13
MND-01-1014-0005	29 JUL 92	---	---	---	---	---	---	---	8
MND-01-1016-0003	30 JUL 92	---	---	---	---	---	---	2	8
MND-01-1046-0005	4 AUG 92	---	---	---	---	2	---	188	3 *
MND-01-1047-0005	4 AUG 92	---	---	---	---	7	---	4	---
MND-01-1048-0005	4 AUG 92	---	---	---	---	6	---	4	---
MND-01-1050-0003	4 AUG 92	---	---	---	---	---	---	8	---
MND-01-1050-1003	4 AUG 92	---	---	---	---	---	---	17	27 *
MND-01-1051-0003	4 AUG 92	---	---	---	---	---	---	8	5 *
MND-01-1052-0003	4 AUG 92	---	---	---	---	---	---	---	13 *
MND-01-1053-0002	5 AUG 92	2	---	---	---	---	---	---	447
MND-01-1054-0005	5 AUG 92	4	---	---	---	7	---	226 *	11
MND-01-1055-1005	5 AUG 92	---	---	---	---	---	---	4 *	5
MND-01-1057-0005	5 AUG 92	---	---	---	---	---	---	---	24
MND-01-1062-0003	5 AUG 92	---	---	---	---	13	---	6	---
MND-01-1064-0005	11 AUG 92	---	---	---	---	---	---	---	19
MND-01-1066-0005	11 AUG 92	---	---	---	---	6	---	---	226
MND-01-1067-0005	11 AUG 92	---	---	---	---	---	---	11	133
MND-01-1069-1005	12 AUG 92	---	---	---	---	---	---	---	37
MND-01-1070-0005	12 AUG 92	---	---	---	---	---	---	---	5
MND-01-1070-1005	12 AUG 92	---	---	---	---	---	---	---	5
MND-01-1072-0005	12 AUG 92	---	---	---	---	---	---	---	106
MND-01-1074-0005	12 AUG 92	---	799	---	---	---	1191	---	5
MND-01-1074-1005	12 AUG 92	---	812	---	---	---	1117	---	5
MND-01-1075-0005	12 AUG 92	---	---	---	---	---	---	---	80
MND-01-1076-0005	12 AUG 92	---	2934	---	---	148	---	---	---
MND-01-1077-0005	12 AUG 92	---	---	---	---	---	---	---	27
MND-01-1079-0005	13 AUG 92	---	13	---	---	---	---	---	---
MND-01-1080-0005	13 AUG 92	---	13	---	---	---	---	---	---
MND-01-1085-0005	13 AUG 92	---	102	---	---	22	---	41	---
MND-01-1086-0005	13 AUG 92	---	47	---	---	---	---	---	---
MND-01-1093-0005	15 AUG 92	---	**131000	247	40800	---	---	**34780	53 *
MND-01-1094-0005	14 AUG 92	---	83	13	485	---	---	978	---
MND-01-1097-0002	14 AUG 92	---	---	---	---	---	---	6	8
MND-01-1099-0005	15 AUG 92	---	---	---	---	---	---	4	8 *
MND-01-1101-0005	16 AUG 92	---	865	---	---	---	---	---	8
MND-01-1102-0005	16 AUG 92	---	419	---	---	---	---	---	13
MND-01-1106-0003	16 AUG 92	---	329	---	---	---	---	6	---
MND-01-1108-0005	16 AUG 92	---	---	---	---				
MND-01-1109-0005	16 AUG 92	---	---	---	---				
MND-01-1110-0005	16 AUG 92	---	---	---	---				

Notes:
Only sample locations having positive detections are shown.
*: Associated trip, ambient, equipment or field blank contained specified compound.
B: Indicates blank sample.
w: Indicates water sample.
**: Freon 113 & TCE Off-Scale

Document Control No. _____

Environmental Restoration Program

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

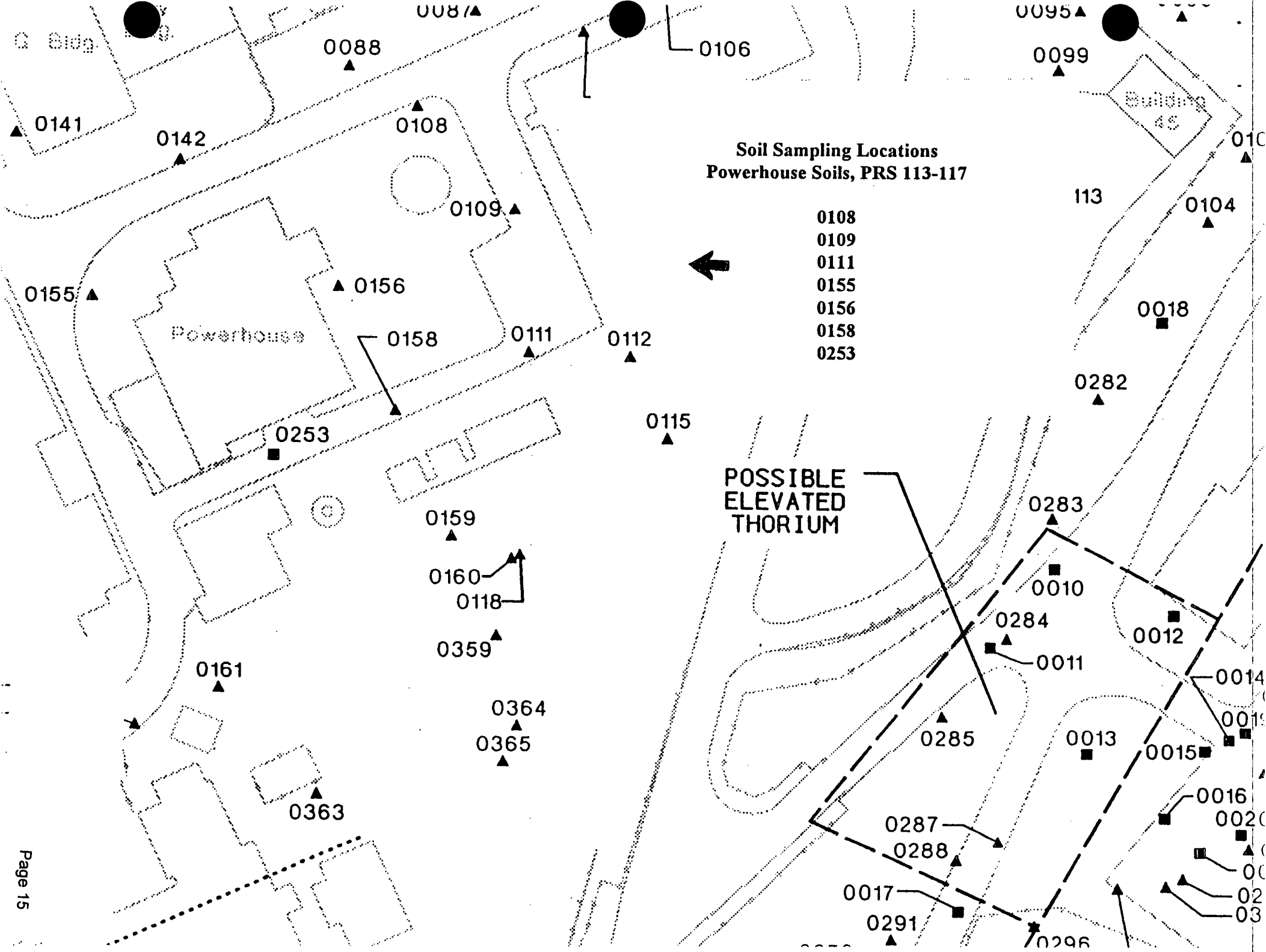
MOUND PLANT
MIAMISBURG, OHIO

June 1993

FINAL

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies


Soil Sampling Locations
Powerhouse Soils, PRS 113-117
0108
0109
0111
0155
0156
0158
0253
POSSIBLE ELEVATED THORIUM
Powerhouse
Building 45
0087
0088
0106
0095
0099
0141
0142
0108
0109
0155
0156
0158
0111
0112
0253
0115
0159
0160
0118
0359
0161
0364
0365
0363
113
0104
0018
0282
0283
0010
0284
0012
0011
0285
0013
0015
0016
0287
0288
0017
0291
0296

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)
S0104	1760	2195	4082	10-83	0	0.18	b	0.38				
S0105	1525	2340	3056	10-83	0	0.01	b	0.90				
S0106	1525	2415	6202	08-84	0	0.06	b					
S0107	1525	2465	6201	08-84	0	0.52	b					
S0108	1525	2565	3061	10-83	0	0.36	b	2.87				
S0109	1600	2540	6197	08-84	0	0.55	b					
S0110	1675	2315	6203	08-84	0	0.41	b					
S0111	1675	2565	6198	08-84	0	0.72	b					
S0112	1700	2515	6200	08-84	0	0.12	b					
S0113	1725	2265	3057	10-83	0	0.06[c]	b					
S0114	1750	2365	6204	08-84	0	0.07	b					
S0115	1750	2515	6199	08-84	0	0.41[c]	b					
S0116	1775	2340	6205	08-84	0	0.04	b					
S0117	1775	2415	3058	10-83	0	0.01	b					
S0118	1775	2615	3060	10-83	0	0.62	b	2.13				
S0119	0925	2770	6767	08-83	0	0.42	b		LDL	0.5	0.9	LDL
S0120	0950	2695	4068	10-83	0	0.25	b					
S0121	0950	2845	4069	10-83	0	0.46	b					
S0122	0975	2970	4070	10-83	0	0.04[c]	b					

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

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)
S0142	1500	2695	6181	08-84	0	0.43	b					
S0143	1200	3050	3049	10-83	0	0.46	b	1.34				
S0144	1225	3375	3045	10-83	0	0.03	b	6.33				
S0145	1250	3175	6182	08-84	0	0.02	b					
S0146	1300	3225	6183	08-84	0	0.64	b					
S0147	1350	3175	3047	10-83	0	0.02	b					
S0148	1350	3325	3046	10-83	0	0.20	b					
S0149	1375	3025	3044	10-83	0	0.15	b					
S0150	1400	3025	3048	10-83	0	0.06[c]	b					
C0252	1445	3015	8400	12-84	36	0.13	b					
S0152	1475	3050	6184	08-84	0	0.20	b					
S0153	1475	3175	6185	08-84	0	0.20	b					
S0154	1495	3325	6186	08-84	0	0.03	b					
S0155	1550	2770	3090	10-83	0	0.54	b					
S0156	1600	2645	3095	10-83	0	0.27[c]	b					
C0253	1670	2715	8396	12-84	36	0.11	b					
S0158	1675	2645	3094	10-83	0	0.73	b					
	----	2645	6210	08-84	0	0.17	b					
		2620	6209	08-84	0	0.17	b					

COMPARISON OF ACTUAL SOIL GAS VALUES WITH CALCULATED ACCEPTABLE SOIL GAS VALUES

SCREENING POTENTIAL RELEASE SITES BASED ON SOIL GAS READINGS

Soil gas readings can be utilized in the PRS screening process to identify potential release sites that may present a potential soil contamination problem for volatile organics. The soil gas survey that was conducted at Mound as part of the "Reconnaissance Sampling Report–Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill" investigated 8 volatile compounds. The concentrations of these compounds in the in the vapor phase within the pore spaces of the soil can be correlated to the actual soil contaminant concentrations by utilizing a method developed by ICF Kaiser Engineers. This technique has been used with US EPA Region IX approval at a large Superfund site contaminated with many of the same chemicals found at relatively low levels in soils at the Mound Plant.

The soil concentration can be estimated from the soil gas values by the following equation:

$$Ct = (Cg/Pb)*[[Pb * Kd / H] + [pw / H] + [pt - pw]]$$

where

Cg	concentration of volatile chemical concentrations as soil vapor in ng/ml
Pb	Bulk density of the soil in g/ml
Kd	soil/water partition coefficient in ml/g
H	Dimensionless Henry's Law Constant
pw	water filled porosity
pt	total porosity
Ct	target soil concentration in ng/g or ug/kg (ppb)

The technique that Mound Plant will use for screening a PRS, is to compare the soil gas values obtained at a PRS with soil gas concentrations that are known to be below any regulatory or health based level of concern. The risk based guideline values for the Mound Plant (DOE, December 1995) soils are based upon 10^{-6} risk levels or a hazard index of 1. These values correspond to direct soil exposure to persons who's activities place them at the highest risk, in particular inhalation and ingestion by a Mound Plant construction worker.

Another potential exposure path must be considered, however. The potential for some of the organic contaminants to leach into ground water must be considered in developing protective soil screening levels. A "Mound Plant Soil Screening Level" paper explains the calculation of soil screening levels. For all of the chemicals that the soil gas survey identified, the calculated soil screening level soil concentrations are below the standard guideline values, therefore they are more conservative and are appropriate to be used as the basis for the soil gas calculations.

By re-arranging the equation, and using either the soil guideline values or the soil screening levels as the target soil concentration, a soil gas concentration can be calculated; this calculated soil gas concentration can be compared to the actual observed soil gas values:

$$Cg = (Pb*Ct)/[[Pb*Kd/H] + [pw/H] + [pt-pw]]$$

The values of the soil specific and chemical parameters for this equation are summarized as follows:

Pb	1.6	Bulk density of the soil in g/ml
pw	0.15	water filled porosity
pt	0.43	total porosity
foc	0.02	fraction organic material in soil (used in developing the SSL values)

Typical chemicals that are detected with soil gas sampling are:					
NAME	H	Kd	Calculated Acceptable Soil Screening Level Value	Calculated Acceptable Soil Gas Reading	Calculated Acceptable Soil Gas Reading
		ml/g	mg/kg (ppm)	ng/ml	ppb
Toluene	2.52E-01	3.42	22.06	1.56E+03	414600
Trichloroethene (TCE)	4.35E-01	2.24	0.07	1.26E+01	2400
111 Trichloroethane (TCA)	7.63E-01	2.2	3.01	9.46E+02	173400
Trans-1,2 Dichloroethene (DCE)	2.29E-01	1	0.70	1.41E+02	35700
cis-1,2 Dichloroethene (DCE)	1.85E-01	2.78	0.31	1.97E+01	5000
Freon 11	NA	NA			
Freon 113	NA	NA			
Tetrachloroethene (PCE)	7.09E-01	2.78	0.09	2.13E+01	3100

na not available

IF THE SOIL GAS READING IS BELOW THE VALUES IN THE CALCULATED SOIL GAS READING COLUMN (SHADED), THEN THERE IS NO THREAT TO GROUNDWATER FROM THIS PRS.

The soil screening level values are calculated using the Soil Screening Methodology. The Potential Release Site is assumed to be more than 100 meters from a potential drinking water source with an aquifer thickness of 15 meters and a source size of 10 meters. The hydraulic gradient is assumed to be 0.01 which is conservative for most of the Mound Plant PRSs. In special instances where the PRS lies less than 100 meters from a potential drinking water source, or the hydraulic gradient is much less than 0.01, new SSL values and new acceptable soil gas values will be calculated for that particular PRS.

Environmental Restoration Program

REMOVAL SITE EVALUATION
ACTION MEMORANDUM

FUEL OIL STORAGE REMOVAL ACTION (FOSRA)

MOUND PLANT
MIAMISBURG, OHIO

November 1995

DRAFT

(Revision 0)

Department of Energy
Ohio Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

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ACRONYMS

AEC	Atomic Energy Commission
AM	Action Memorandum
ARARs	Applicable or Relevant and Appropriate Requirements
BGS	Below Ground Surface
BVA	Buried Valley Aquifer
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	Decontamination & Decommissioning
DOE	U.S. Department of Energy
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
ER	Environmental Restoration
FFA	Federal Facilities Agreement
FSP	Field Sampling Plan
ID	Identification
LSA	Low Specific Activity
mrem	millirem
MSL	Mean Sea Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NTS	Nevada Test Site
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
OU	Operable Unit
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
pCi/g	picocuries per gram
RCRA	Resource Conservation and Recovery Act
RESRAD	Residual Radioactive Material Program
RI/FS	Remedial Investigation/Feasibility Study
RSE	Removal Site Evaluation
SARA	Superfund Amendments and Reauthorization Act
SW	Semi-Works
TRU	Transuranic

1. PURPOSE

The U.S. Department of Energy (DOE) is the designated lead agency under the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) and removal actions at the Mound Plant are implemented as non-Superfund, federal-lead actions. DOE provides the On-Scene Coordinator (OSC). Non-Superfund, federal-lead, removal actions are not subject to United States Environmental Protection Agency (EPA) limitations on the OSC ($50,000 authority) and are not subject to National Oil and Hazardous Substances Pollution Contingency Plan (NCP) limitations on removal actions (i.e., $2,000,000 in cost and 12 months in duration).

This Removal Site Evaluation/Action Memorandum (RSE/AM) has been completed to document the evaluation of site conditions and the removal action described herein for fuel oil contaminated soils associated with the Right Sizing E S & H II Fuel Oil Storage System Fifty-Thousand Gallon Above-Ground Tank Project located within the DOE Mound Plant.

2. SITE CONDITIONS AND BACKGROUND

In 1947, a storage system was installed for fuel oil for use in firing the heating plant boilers at Mound Plant. This system consisted of a 315,000-gallon above-ground tank in the lower area next to the railroad spur and four 25,000-gallon underground tanks located in a north-south row on the east side of "P" Building.

Beginning at the north tank, the underground tanks have been historically designated as Tanks 1-4. In the time between installation and 1965, leaks developed in the underground tanks. During 1965 the two southern-most tanks were replaced and thereby the oil leaks were stopped. Apparently no clean-up of the released oil was made at that time.

There have been no known leaks in the above ground tank.

In 1995, a plan was implemented to optimize the fuel oil storage capacity at the Mound Plant to more closely approximate usage and to avoid storage of excess quantities. This plan provided a 50,000-gallon above-ground replacement tank with removal of the above-ground tank and closure operations on the four underground tanks.

It was during the closure of the first of the four underground tanks that the leakage of the fuel oil was discovered. To date, three of the four tanks have been removed. The fourth tank will remain in service until the planned above-ground replacement tank is constructed on the site of the three removed tanks. The fourth tank has been partially excavated in preparation for its removal when the replacement system is complete.

During closure operations, the site evaluation contractor inadvertently designated the tanks as Tanks 1-4 in the order of tank removal. That placed the designation in reverse order to the historic designation since the historic Number 4 Tank was removed first. Since all analytical results presented as part of this removal site evaluation conform to the revised tank designation, it will be used throughout this document rather than the original designation, unless otherwise indicated.

2.1. SITE DESCRIPTION

This section describes the physical site location, site characteristics, release of contaminants into the environment and the site's National Priorities List (NPL) status.

2.1.1. Physical Location

The Mound Plant is a 306-acre site on the south border of the city of Miamisburg in Montgomery County, Ohio (Figure 2.1). The site is approximately 10 miles south-southwest of Dayton and 45 miles north of Cincinnati. The subject fuel oil contamination area is approximately 60 feet by 80 feet, located on the east side of the Mound Power House and across the drive from the west side of Building 28. (Figure 2.2)

2.1.2. Site Characteristics

The Fuel Oil Contamination Site is at the historic location of four 25,000-gallon underground storage tanks which have occupied the site since 1947. The tanks were cylindrical in shape, approximately 38' 7" in length by 10' 6" in diameter. Roughly half of each tank's diameter was below the area's natural grade, with the upper half covered by sloping fill comprised of a combination of reclaimed backfill material from the excavation and gravel aggregate. The excavation itself was backfilled with aggregate. The tanks were set on concrete footers with approximately 2' of aggregate beneath. Figure 2.3 is a drawing from the original construction of Tank Nos. 3-4 (Original Tank Number Designation) which occurred in the mid 1960s.

Exploratory excavations made as part of this removal site evaluation, and from which samples were collected for chemical analysis, revealed that the site is underlain with interbedded layers of soft sedimentary rock and thin layers of clay. The rock is impervious while the clay was visually heavily and obviously laden with fuel oil. A strong odor of oil also permeated the surrounding area. Soil boring information supporting these observations of underlying geology are included in this site description as Figure 2.4 through Figure 2.6.

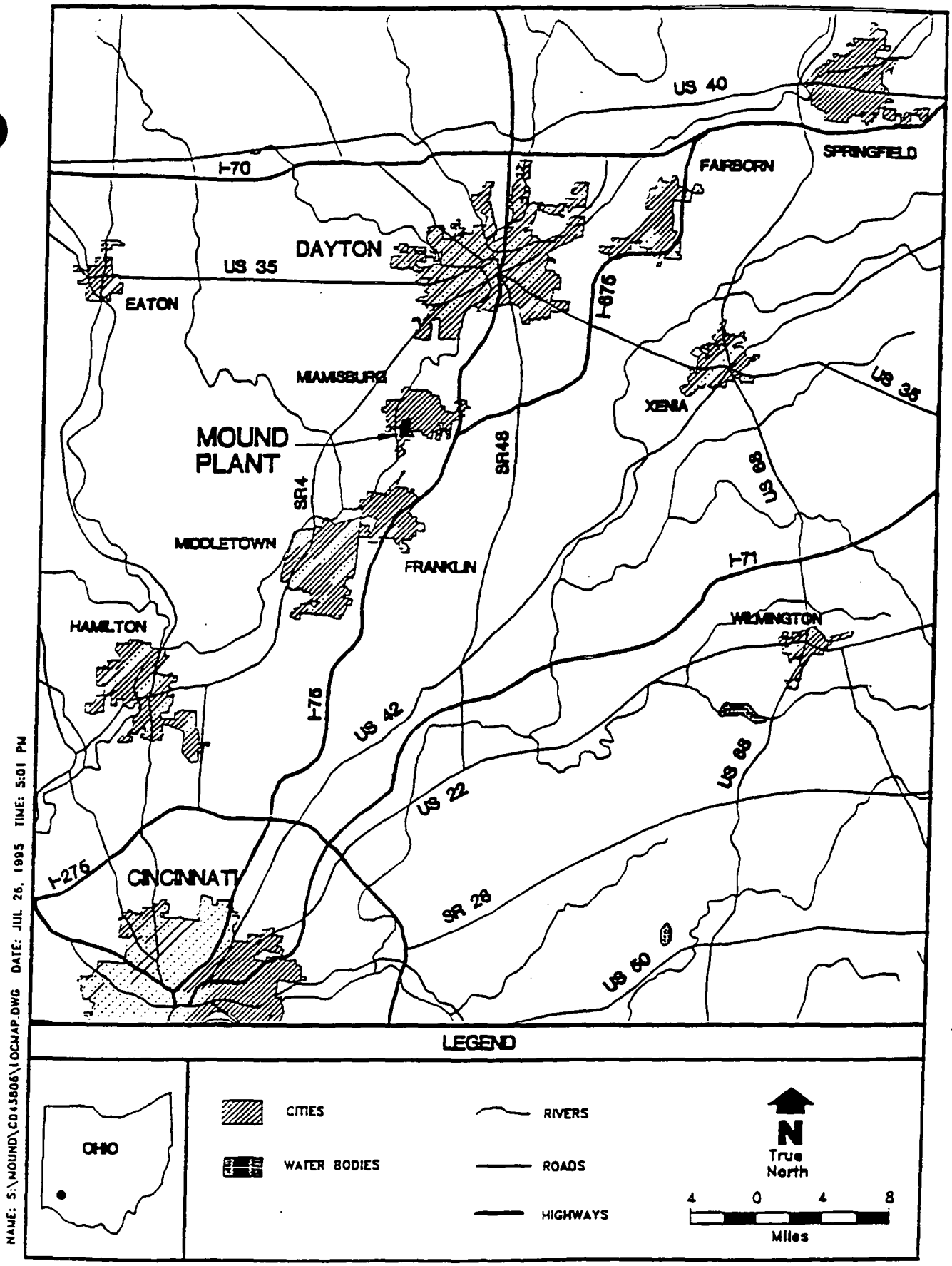

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FIGURE 2.1

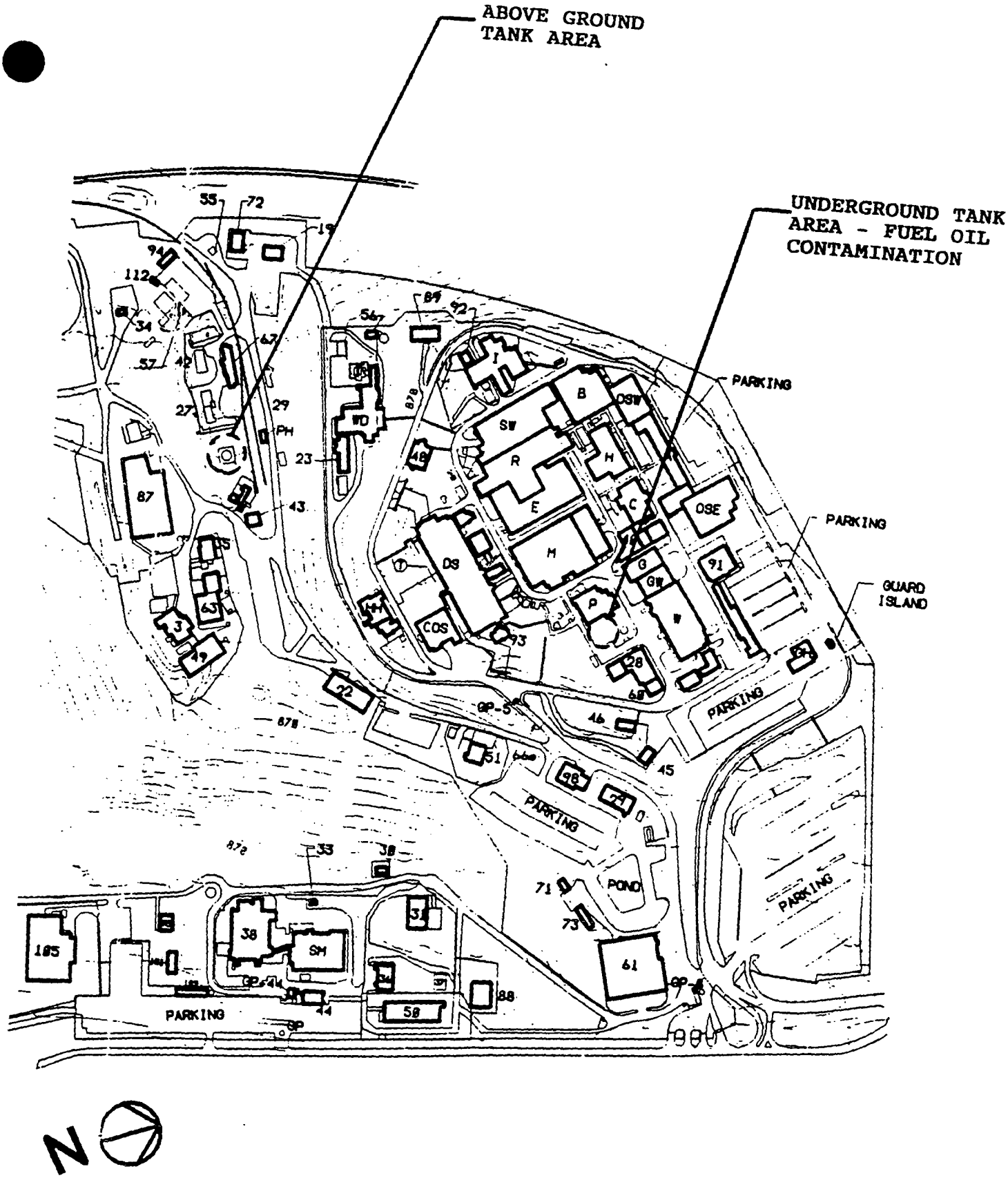

ABOVE GROUND TANK AREA
UNDERGROUND TANK AREA - FUEL OIL CONTAMINATION
PARKING
PARKING
GUARD ISLAND
PARKING
PARKING
PARKING
PARKING
POND
N

FIGURE 2.2

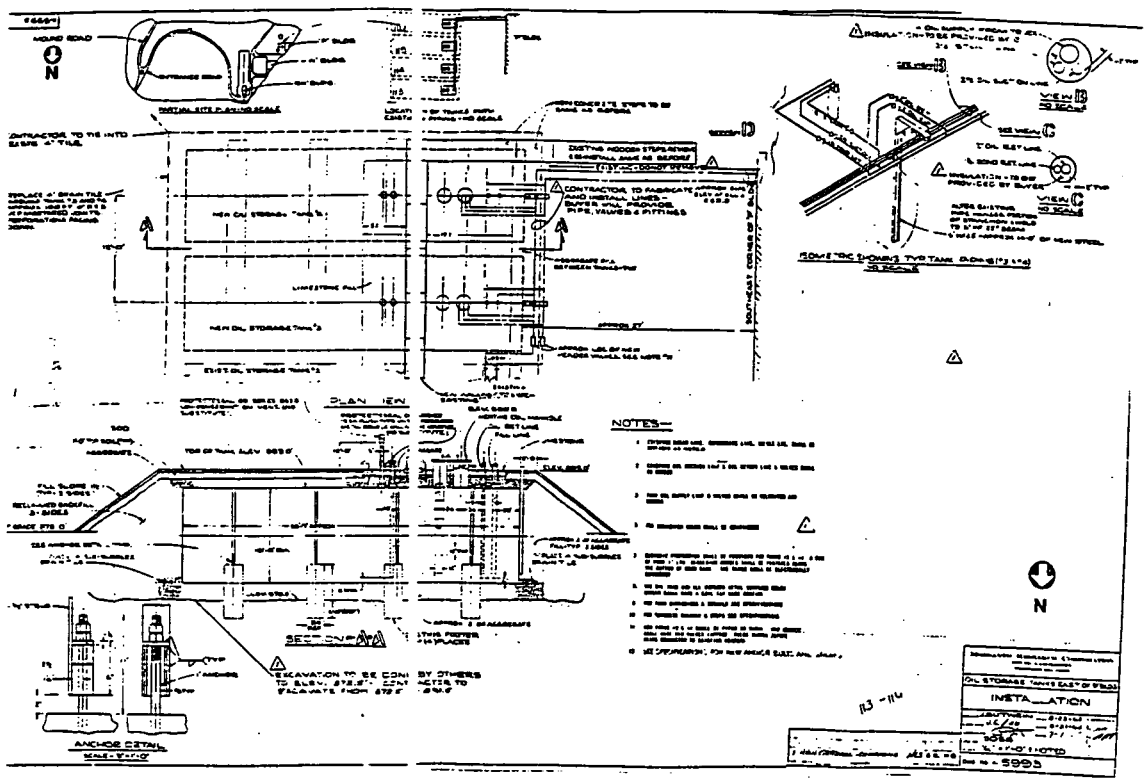


FIGURE 2.3

/usr2/19000/1909214/urch.dgn

LOG OF BORING NO. 2

SOIL STUDY FOR PROPOSED FUEL STORAGE TANK, NEAR BUILDING 28, MOUND LABORATORY, MIAMISBURG, OHIO

BORING LOCATION: 2471.9S; 1817.3W — DATE STARTED: 11/20/89

SURFACE ELEVATION: 877.23' — DATE COMPLETED: 11/20/89

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6"	"N" BLOWS /Ft. OR CORE REC.
0.0' 0.5'	(FILL) Topsoil				
3.5'	(FILL) Hard dark brown silt and sand, some clay, trace gravel, trace small roots - damp	1A	1.0- 2.5	5-17-40	57
5' 6.0'	(FILL) Hard brown and gray silt and clay, trace sand, trace gravel, trace rock fragments-moist	2A	4.0- 5.5	10-22-42	64
	(FILL) Hard brown silt, some clay, some sand, some rock fragments - damp	3A	6.5- 7.5	19-81	100
10'		4A	9.0-10.5	46-52-70	100+
15'		5A	14.0-14.5	100	100+
18.0'	(ORIGINAL) Gray shale (Auger refusal at 19.5')	6A*	18.0-18.5	100/3"	100+
20'	Bottom of boring at 19.5'				
25'	*NOTE: Second boring was made at 2' south from the original boring on 12/29/89 to obtain this sample.				
30'					

	WATER OBSERVATIONS	TYPE SAMPLER
METHOD: HOLLOW STEM AUGER	INITIAL DEPTH: None	X A. SPLIT-SPOON
TECHNICIAN: KB-JF	COMPLETION DEPTH: None	B.
JOB NO. 50991 mja(#213)	DEPTH AFTER: ____ HRS. ____	C. SHELBY TUBE

FIGURE 2.5

III-1

LOG OF BORING NO. 1

SOIL STUDY FOR PROPOSED FUEL STORAGE TANK, NEAR BUILDING 28, MOUND LABORATORY, MIAMISBURG, OHIO

BORING LOCATION: 2448.2S; 1795.8W — DATE STARTED: 11/20/89

SURFACE ELEVATION: 876.02' — DATE COMPLETED: 11/20/89

STRATUM	DESCRIPTION OF MATERIAL	SAMPLE NO. & TYPE	SAMPLE DEPTH	BLOWS PER 6"	"N" BLOWS /Ft. OR CORE REC.
0.0'	(FILL) Asphalt pavement (2")				
0.2'	(FILL) Concrete pavement				
1.0'	(FILL) Hard brown silt, some clay, some sand, trace gravel, trace rock fragments - damp	1A	1.0- 2.5	14-18-40	58
3.0'	(FILL) Hard brown silt, some sand, trace rock fragments, trace clay, trace gravel-damp	2A	4.0- 5.0	100-70	100+
		3A	6.5- 7.0	100	100+
		4A	9.0- 9.5	100/5"	100+
		5A	14.0-14.5	100/3"	100+
15'	Bottom of boring at 14.5'				
5'					
10'					
20'					
25'					
30'					

	WATER OBSERVATIONS	TYPE SAMPLER
METHOD: HOLLOW STEM AUGER	INITIAL DEPTH: None	X A. SPLIT-SPOON
TECHNICIAN: KB-JF	COMPLETION DEPTH: None	B.
JOB NO. 50991 mja(#213)	DEPTH AFTER: ___ HRS. ___	C. SHELBY TUBE

FIGURE 2.6

2.1.3. Release or Threatened Release into the Environment

A release of Number 5 Fuel Oil apparently occurred and prompted the replacement of Tanks 3 and 4 (Original Designation) in 1965. The released oil was not cleaned-up at that time. The tanks most recently removed from that same location were sound and without leaks. The extensive soil contamination by the fuel oil was observed at the time of tank closure.

Initial analysis of samples collected as prescribed by BUSTR (OAC 1301:7-9-12 (K)(4)(c)) indicate petroleum contamination at the following concentrations:

TANK NO. 1

Total Petroleum Hydrocarbons (TPH)	3300 mg/kg
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	
Benzene	< 136 ug/kg
Toluene	245 ug/kg
Ethylbenzene	< 91 ug/kg
Xylenes	1610 ug/kg

TANK NO. 2

TPH	5810 mg/kg
BTEX	
Benzene	< 29 ug/kg
Toluene	54 ug/kg
Ethylbenzene	< 20 ug/kg
Xylenes	381ug/kg

TANK NO. 3

TPH	2010mg/kg
BTEX	
Benzene	<61ug/kg
Toluene	257ug/kg
Ethylbenzene	373ug/kg
Xylenes	1320ug/kg

BUSTR Action Levels are:

TPH	642 mg/kg
BTEX (Soil Matrix)	
Benzene	170 ug/kg
Toluene	7000 ug/kg
Ethylbenzene	10000 ug/kg
Xylenes	47000 ug/kg

In an attempt to further define the vertical extent of contaminant migration, a series of test excavations was performed. These excavations were given RSE Stage numbers. The results of these activities are presented below. The Stage I Test excavations were performed on April 3 through April 5, 1995. A sampling of the site performed on April 6, 1995 produced the following results.

(NOTE: All subsequent BTEX results were below the BUSTR Action Level. Therefore, only TPH results are presented hereafter)

Tank 1 TPH	320mg/kg
Tank 2 TPH	370mg/kg
Tank 3 TPH	58mg/kg
Excavation Sidewall TPH	25mg/kg

Subsequent RSE Stage test excavations were performed. In RSE Stage II excavations a test pit was dug beneath the center point of the Tank 1 location. The pit was excavated to a depth 2 feet below the base elevation (870.5 feet) beneath the tank. A sample taken from that location was analyzed for TPH and BTEX. Those results are as follows:

Tank 1-Center Base + 2 Feet-TPH 840 mg/kg

A similar test pit was excavated beneath the west end of the Tank 2 location. That pit was excavated to a depth of 4 feet below the base elevation. TPH results were:

Tank 2-West/Base+ 4 Feet-TPH 757 mg/kg

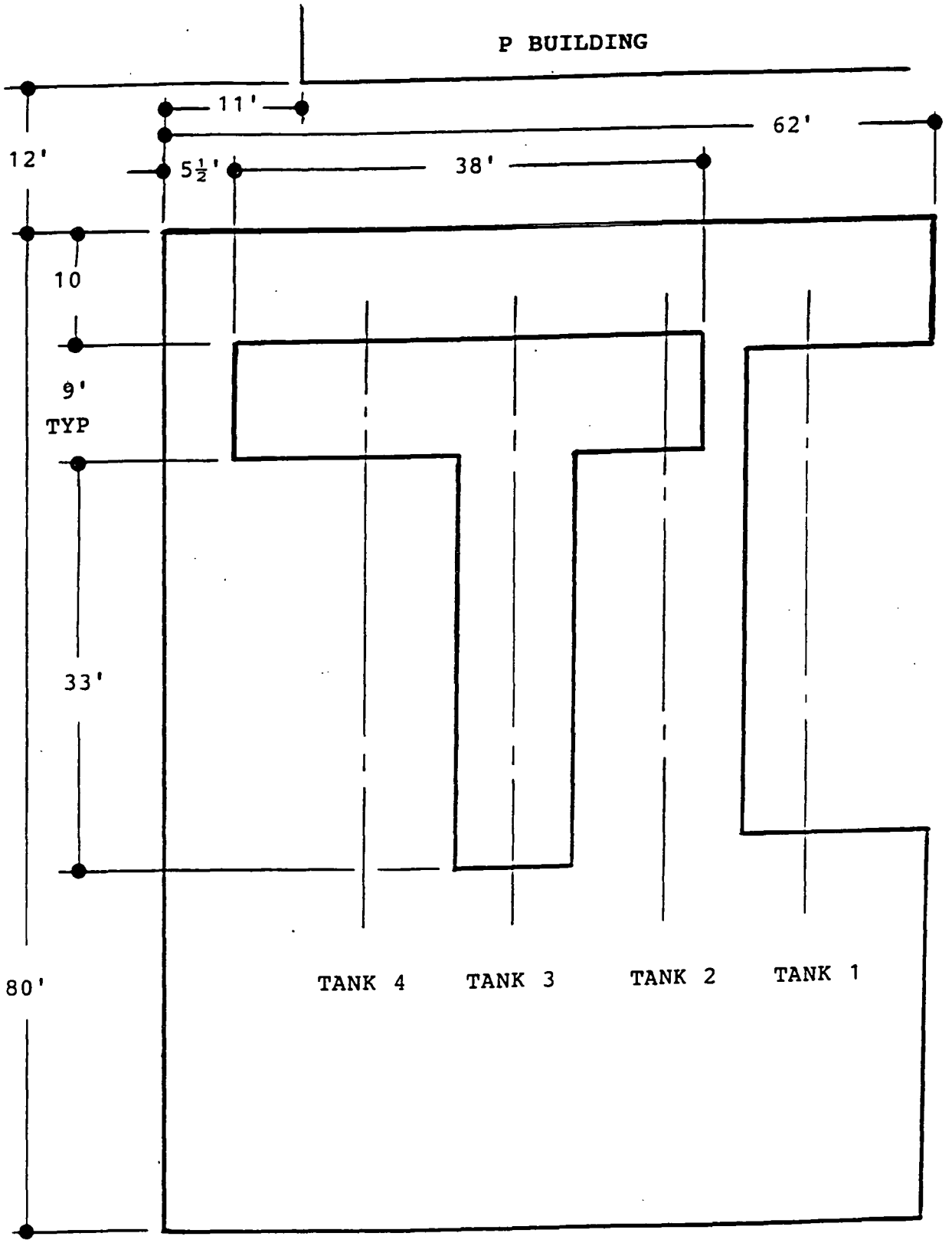
Since these results indicated the contamination exists at elevated levels up to 4 feet below the base elevation, it was decided to make additional Stage III test excavations. In this instance, a "T" shaped trench was excavated (see Figure 2.7). Four samples were taken from the trunk of the "T". An additional two samples were taken, one from each of the distal ends of the transept of the "T". The south transept sample was designated as sample T-1. The north transept sample was designated as sample T-2. The four samples taken from the trunk of the "T" were designated as samples T-3 through T-6. Sample T-6 was located at the extreme base of the "T" with the remaining sample points located at equidistance along the trunk. The distance between sample points along the trunk was 8 feet. There was an additional 8 foot distance between sample point T-3 and the joint of the trunk and transom. The floor of the "T" trench was approximately 7 feet below the base elevation. TPH results for each of the samples was:

T-1	190 mg/kg
T-2	25 mg/kg
T-3	52 mg/kg
T-4	38 mg/kg
T-5	25 mg/kg
T-6	32 mg/kg

The Stage IV test excavations were performed to evaluate contamination at the center of Tank 1. Sample results after that excavation indicated a TPH value of 171mg/kg.

All sample results taken during RSE Stage III and Stage IV excavations were below the BUSTR Category 2 Action Level for soil matrix.

In the course of excavating the test pits and the "T" trench, the soil contaminated above the BUSTR Category 2 Action Level was removed. Therefore, no further removal action is necessary and the site closure could continue. Approximately 1800 cubic yards of soil was removed from the site during tank excavation and during the Removal Site Evaluation.



EXCAVATION PLAN VIEW SHOWING "T" TRENCH

(ORIGINAL TANK DESIGNATIONS)
FIGURE 2.7

These soils were moved to a staging area and were evaluated according to BUSTR Sampling Requirements. TPH analytical results for six samples are as follows:

Sample	
P-10	88mg/kg
P-11	580mg/kg
P-12	864mg/kg
P-16	222mg/kg
P-17	31mg/kg
P-18	155mg/kg

2.1.4. National Priorities List Status

The EPA placed the Mound Plant in Miamisburg, Ohio on the NPL by publication in the Federal Register on November 21, 1989.

2.2. OTHER ACTIONS TO DATE

The Mound Plant initiated a CERCLA program in 1989, now guided by the agreement between the DOE, Ohio Environmental Protection Agency (OEPA), and EPA. A Federal Facilities Agreement (FFA) under CERCLA Section 120 was executed between DOE, EPA Region V, and OEPA on October 12, 1990, and was revised on July 15, 1993 (EPA Administrative Docket No. OH 890:008 984). The general purposes of this agreement are to:

- Ensure that the environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate remedial action taken as necessary to protect the public health, welfare, and the environment;

- Establish a procedural framework and schedule for developing, implementing, maintaining, and monitoring appropriate response actions at the site in accordance with CERCLA, Superfund Amendments and Reauthorization Act (SARA), the NCP, Superfund guidance and policy, and Resource Conservation and Recovery Act (RCRA) guidance and policy; and,

- Facilitate cooperation, exchange of information, and participation of the parties in such actions.

The CERCLA program is assessing and evaluating the current risks, as necessary, for over 325 potential release sites. These potential release sites have been grouped into various OUs.

2.2.1. Previous Actions

The above-ground tank in the lower area and the four underground tanks east of the Powerhouse have been used for the storage of fuel oil since 1947. No previous other investigations or activities at the tank sites are known.

2.2.2. Current Actions

Actions to implement the plan to optimize the fuel storage system at Mound are in progress. The above ground tank in the lower area has been removed and the three southernmost of the underground tanks east of the Powerhouse have been removed. Soil which was contaminated above allowable limits has been found to have been removed during the RSE process and the area has been backfilled.

The replacement system tank and auxiliary services installation is nearing completion.

The final underground tank has been partially excavated and awaits the completion of the replacement system tank installation so that its contents can be transferred and it can be removed and the site closed. Due to its proximity to the other tanks discussed herein that site may also be contaminated. Appropriate sampling and closure measures will be accomplished at that time.

2.3. STATE AND LOCAL AUTHORITIES' ROLES

2.3.1. State and Local Actions to Date

In 1989, as a result of Mound Plant's placement onto the NPL, DOE and the USEPA entered into a FFA which specified the manner in which the Mound CERCLA-based Environmental Restoration (ER) program was to be implemented. In 1994 the FFA was amended to include the OEPA. Under the ER program DOE remains the lead agency.

2.3.2. Potential for Continued State and Local Response

The proposed aboveground replacement fuel oil storage tank is slated for use by DOE in the near term. Eventual release for other commercial (non-DOE) use is planned. Periodic environmental monitoring of the area may be required until final remedial action is implemented. This monitoring would need to be coordinated with local, state, and federal authorities.

Current plant-wide environmental monitoring programs will continue until such time as remediation is complete in this and adjacent areas.

3. THREAT TO PUBLIC HEALTH, WELFARE OR THE ENVIRONMENT

The uncontrolled release of fuel oil at the underground tank site has created a threat to the public health, welfare or to the environment. No site specific risk based standards are available to guide a removal action. The tanks in question are exempt from BUSTR regulation. However, BUSTR corrective action clean-up standards are appropriate in this instance. Based on analysis of samples taken from the underground tank site, BTEX is not a problem. However, TPH values do exceed the BUSTR action level of 642 mg/kg for Category 2 and 105 mg/kg as approved by USEPA and OEPA for release of treated soils (see Appendix A-1 and A-2).

3.1. THREATS TO PUBLIC HEALTH OR WELFARE

Concern over the contamination of soil in the vicinity around the underground fuel oil storage tank site was raised when the tanks were removed. The condition of the underlying rock suggests that the contaminants could migrate from the source through the soil. In addition, given the area topography, unknown leaching and migration characteristics could result in the surfacing of contaminants with a resulting entry into the plant drainage ditch south of the underground tank area. There has been no concern raised regarding the above-ground tank site as there are no known instances of leakage in that area..

3.2. THREATS TO THE ENVIRONMENT

As discussed above, fuel oil leaked into area soils at the underground storage tank site. That material is contamination that has been released to the environment. Subsurface soil and groundwater act as potential pathways for the migration of this contamination to the plant drainage ditch and subsequently to the Great Miami River. No fuel oil contamination has been detected in the drainage ditch soils or surface and groundwaters. However, extensive soil contamination levels have been observed and migration pathways are probable.

3.3. Removal Site Evaluation

The RSE requirements, as outlined under EPA's NCP regulations in 40 CFR 300.415, are presented throughout this RSE/AM. The source and nature of the release are described in Sections 2.1.2. and 2.1.3. An evaluation by public health agencies has not been performed for this area, and therefore is not included in this RSE/AM. The evaluation of potential exposure to the contamination is described in those sections, as well as in Section 3. The determination of the need for a removal action is outlined in this section, in Table III.1.

As regards that determination, the NCP includes eight factors that must be considered in determining the appropriateness of a removal action (40 CFR 300.415(b)(2)). These criteria, as applied to the contamination of the storage tank area by the leaked fuel oil, are evaluated in Table III.1.

It is possible that the fuel oil contaminated soil may extend into a perched groundwater strata. The contamination discovered at the time of tank closures was extensive. Follow-up investigations conducted as part of this removal site evaluation indicated that both vertical and lateral migration had occurred. The condition of the underlying soil and rock is such that the potential for migration of the fuel oil is possible.

In summary, concentrations of fuel oil existed that (a) provided high levels of contaminants in soils that could migrate, (b) had no other appropriate federal or state response mechanism, and (c) constituted a situation potentially threatening to the public welfare. A time-critical removal action, focused on source removal of the fuel oil contaminated soils from the subject area was appropriate to mitigate potential source migration. Acceptable action levels are those established by the Ohio Bureau of Underground Tank Regulation (BUSTR) for corrective actions of petroleum contaminated soils (OAC 1301:7-9-13 (E).

Table III-1 Evaluation of Removal Action Appropriateness Criteria [40 CFR 300.415(b)(2)]

Criteria	Evaluation
(i) "...potential exposure to nearby human populations, animals, or the food chain..."	None
(ii) "Actual or potential contamination of drinking water supplies..."	The fuel oil contaminated soils are located immediately beneath the location of the underground fuel oil tanks removal site. Although there is no direct evidence of drinking water contamination, the presence of highly fractured and fissured rock in the vicinity creates a potential for that contamination due to the possibility of its movement into a perched groundwater strata.
(iii) "Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;"	Contaminated soils have been shown to exist at the location of the underground tank removal site.
(iv) "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;"	Fuel oil is known to have leaked from tanks removed from the underground tank site. The presence of fuel oil down gradient from the source indicates that surface soil and groundwater are also likely pathways for the potential migration.
(v) "Weather conditions that may cause hazardous substances to migrate or be released;"	None
(vi) "Threat of fire or explosion;"	None
(vii) "The availability of other appropriate federal or state response mechanisms to respond to the release;" and	There are no state mechanisms, no other federal mechanisms (DOE is the designated lead agency at Mound under CERCLA), and no other DOE programs to provide an appropriate response.
(viii) "Other situations or factors that may pose threats to public health or welfare or the environment."	None

4. ENDANGERMENT DETERMINATION

All AMs must contain an Endangerment Determination (EPA 1990). Actual or threatened releases of pollutants and contaminants from this site, if not addressed by implementing the response action selected in this AM, may present an imminent and substantial endangerment to public health, welfare or the environment. This determination is based on the existing fuel oil source area located at the subject underground fuel oil storage tank area and the potential for the migration of the contamination.

5. PROPOSED ACTION AND ESTIMATED COSTS

5.1. PROPOSED ACTION

The proposed action, in an effort to mitigate contamination migration, is the removal, storage, and treatment of fuel oil contaminated soils from a 60 ft by 80 ft area to a depth of 9 ft below base elevation of 870.5 feet. The on-site interim storage and treatment of soils will be done at the Petroleum Biological Treatment Area located on site.

5.1.1. Proposed Action Description

The proposed action will include:

- interim storage of the contaminated soils using BUSTR guidelines;
- Biological Treatment of the soil to a level of 105 ppm TPH as approved by the USEPA and OPEA (see Appendix A-1 and A-2);
- disposal of clean soil at the on-site engineered landfill (spoils area).

The water table is estimated to be at an elevation of about 675 feet and is well below the proposed maximum excavation depth. This removal action is not expected to reach groundwater.

The base soil (i.e., soil and rock) at the underground storage tank is known to have been contaminated with fuel oil. The affected soil was removed by suitable equipment, leaving sidewalls sloped to a stable configuration. Any uncontaminated portion of the affected soils were moved to the uncontaminated spoils area. During the excavation of the affected soils, contamination was monitored. Contaminated soils were removed from the site and stored pending treatment at the on-site Biological Petroleum Soil Treatment Area.

Excavation of contaminated soil proceeded to the expected depth. At that level, the footprint of the excavation was approximately 60 ft by 80 ft (4800 ft^2). Storage is in the Biological Petroleum

Soil Treatment Area and is in accordance with BUSTR regulations. Specifically, the storage area consists of an impervious liner, berm, and an impervious cover to prevent erosion of contaminated soils and leaching of contamination materials into plant run-off.

Migration of the contamination from its original disposal configuration is expected to have occurred, both vertically and laterally. Modification of the excavation to enable pursuit of a limited amount of migrated contamination was allowed for in the selected sloping and excavation methods. However, migration of the contamination could only be removed within the available budget, physical constraints of the site (e.g., utilities, buildings), safety considerations, and excavation equipment limitations.

The excavated area has been backfilled. The area is being used as the location for the construction of a 50,000 gallon above ground fuel oil storage tank and ancillary facilities.

The excavated soils will be stored on-site until treated at the onsite Biological Treatment Area. The storage area will be monitored, controlled and maintained on a routine basis.

At the completion of the removal action, it is expected that some residual contamination remains, but at low concentrations. Soils encountered in the excavation have been removed to below the BUSTR guideline for Category 2 soils (TPH=642 mg/kg).

5.1.1.1. Rationale, Technical Feasibility, Effectiveness

The removal action chosen for the clean-up of the underground storage tank area was necessary to remove an area of known contamination and ensure that further migration of the contamination does not occur. The soils in the vicinity of the fuel oil underground storage tank closure site represented a volume of concentrated contaminants that could serve as a continuing source of migrating contamination. Direct removal of this source was feasible and has been accomplished during test excavations performed as part of the RSE process.

5.1.1.2. Monitoring

Health and safety monitoring was performed throughout the removal site evaluation according to standard Mound procedures. Sampling and analysis of excavated soils were performed in accordance with BUSTR guidelines for petroleum contaminated soil corrective actions.

5.1.1.3. Uncertainties

The major uncertainties at the site were the extent of lateral migration of the fuel oil beyond the immediate tank closure site. Another uncertainty is the disposition of the soils beneath the tank yet to be closed. The soils associated with that tank may be contaminated at approximately the same levels. The minor uncertainties include the current condition of the remaining fuel oil tank and the nature and extent of groundwater that may be encountered during the removal.

All of the uncertainties were within manageable bounds, although the major uncertainties impacted the total amount of soil that would potentially need to be removed. Given the constraints, the contamination that has migrated beyond the defined bounds and objectives of this removal action will be addressed through final remedial actions. These uncertainties therefore do not significantly affect this removal action.

Uncertainties about the current condition of the remaining fuel oil tank are important, but not a hindrance to the removal action. Given the condition of the tanks already removed, sufficient indications about the probable condition of the remaining tank are available to identify other potential problems. Absolute knowledge of the condition of the remaining tank was not a prerequisite to beginning the removal, and the level of uncertainty regarding the lateral migration of the contamination was not a hindrance to the removal action.

Uncertainties about the nature and extent of the groundwater were addressed in the field. Field decisions on dewatering efforts were made as information was gained, rather than relying on pre-excavation studies.

5.1.1.4. Institutional Controls

DOE will remain in control of the subject soil area over the near term. However, portions of the Mound Plant may be released to non-DOE uses in the foreseeable future. It is expected that after the removal action is complete, residual contamination will remain, which will be remediated at a later date. Until that time, DOE's control of the site will continue to be relied on as an institutional control to limit access and reduce exposure potential for any remaining contaminants.

5.1.1.5. Soil Treatment/Disposal

Fuel oil contaminated materials taken from the excavation will be treated on site at the Petroleum Soil Biological Treatment Facility to reduce the TPH levels to 105 ppm, or less. After treatment, remediated soils will go to the Engineered Storage Facility (Spoils Area) for final disposal.

EPA's Offsite Policy does not apply to this removal action.

5.1.1.6. Post-Removal Site Control

Post removal site control will be provided by DOE/Mound. See Institutional Controls above.

5.1.1.7. Cross-Media Relationships and Potential Adverse Impacts

The potential cross-media impact associated with the removal action is the potential for unintended release of contaminated materials via erosion to nearby drainage ditches. Careful monitoring and control will be implemented during the removal action and for the interim storage of the soils prior to treatment..

No potential adverse impacts of the removal action have been identified.

5.1.2. Contribution to Future Remedial Actions

No record of decision for this fuel oil underground storage tank contamination area has been signed and the long-term cleanup of lateral contamination has not been decided. The range of feasible alternatives in that regard has not been identified. Therefore, it is not possible to identify with certainty the interaction of this removal action with the final cleanup of adjacent areas. However, reduction of the source of fuel oil contaminated soils will be in compliance with the BUSTR action level of 642 mg/kg for TPH in Category 2 soils.

To facilitate further actions in or near the site of the removal action, the exact dimensions of the excavation and the levels of contamination identified and removed were documented. Any areas suspected of containing remaining contamination were also documented. The excavation was documented by photographs, record drawings, the OSC report, and other information collected during the removal action to further delineate the limits of the excavation.

This removal action addressed the threat of further migration of the fuel oil contamination located in or around the subject underground storage tank closure site. Because final actions for clean-up of this area are not scheduled for several years, removal of the fuel oil contaminated soil was necessary to keep the final response actions in the area from being more difficult or extensive than necessary.

It is expected that a large portion of the contaminated soil was removed within the constraints described herein. Any remaining contamination is expected to be at lower concentrations than 642 mg/kg TPH.

5.1.3. Description of Alternative Technologies

Several alternative technologies were identified and screened for their ability to meet specific criteria for the removal action. Criteria used to screen alternatives include timely response, protection of human health and the environment, effectiveness, implementability and cost. Alternative technologies frequently evaluated for CERCLA remediation include institutional

controls, containment, collection, treatment and disposal. Based on the prevailing conditions, the following alternatives (in addition to the proposed alternative of excavation and treatment) were developed.

1. No Action
2. Institutional Controls

The performance capabilities of each alternative with respect to the specific criteria is discussed below.

5.1.3.1. No Action

The "No Action" approach was eliminated from consideration because the need for action has been demonstrated as necessary based on the responses to the criteria discussed on Section 3.3.

5.1.3.2. Institutional Controls

Existing Mound Plant institutional controls effectively minimize the potential for contact of the subject contamination with the general public. Implementation of additional institutional controls to minimize the potential for human contact with the existing contamination will not prevent further migration of the contaminants from the source. Also, institutional controls will be difficult to implement when commercial use of adjacent areas is permitted. Thus, institutional controls were eliminated from further consideration.

5.1.4. Engineering Evaluation/Cost Analysis (EE/CA)

Because this is a time-critical removal, an EE/CA is not required.

5.1.5. Applicable, or Relevant and Appropriate Requirements (ARARs)

Mound ARARs for the ER Program Remedial Investigation/Feasibility Study (RI/FS) project have been identified (DOE 1993b). CERCLA regulations require that removal actions comply with ARARs only to the extent practicable.

Only those ARARs that relate to the actual removal action and not to long-term remediation, apply to the removal. The following ARARs are federal and state requirements that are considered practicable for this removal action.

5.1.5.1. Air Quality

- Ohio Administrative Code (O.A.C.) 3745-15-07(A): Air Pollution Nuisances Prohibited
- O.A.C. 3745-17-02(A,B,C): Particulate Ambient Air Quality Standards
- O.A.C. 3745-17-05: Particulate Non-Degradation Policy
- O.A.C. 3745-17-08 (A)(1), (A)(2), (B), (D): Emission Restrictions for Fugitive Dust

5.1.5.2. Worker Safety

- § 29 C.F.R. Part 1910: Occupational Safety and Health Act (OSHA) - General Industry Standards
- § 29 C.F.R. Part 1926: OSHA - Safety and Health Standards
- § 29 C.F.R. Part 1904: OSHA - Recordkeeping, Reporting, and Related Regulations

5.1.6. Other Standards and Requirements

The following is a list of other standards and requirements applicable to this removal action.

5.1.6.1. Mound Plant Manuals and Procedures

Mound Plant manuals and procedures applicable to this removal action include:

- Quality Policy and Responsibilities (MD-10334)
- Quality Assurance Program for Engineering Dept. (MD-10241)
- Standards and Calibration System (MD-10096)
- Safety and Hygiene Manual (MD-10286)
- Radiological Protection Program Manual (MD-10019)
- General Procedures for Calibration of Radiation Protection Instrumentation (MD-10215)
- Waste Certification Program Plan (MD-81020)
- Form ML-7588 Engineering Review Transmittal Sheet
- Form ML-8440 Project Quality Assurance Review
- Form ML-8816 Engineering Department Non-Conformance Report
- Health Physics Procedures (MD-80036)
- Debris Disposal (WS12)
- Environmental Restoration Procedures (OU9 RI/FS QAPjP)

5.1.6.2. DOE Orders/Criteria

The following DOE Orders are applicable to this removal action:

- Radiation Protection for the Public and the Environment (5400.5)
- Project Management System (4700.1)

5.1.7. Project Schedule

The schedule established for planning and implementing the removal action is shown in Figure 5.1

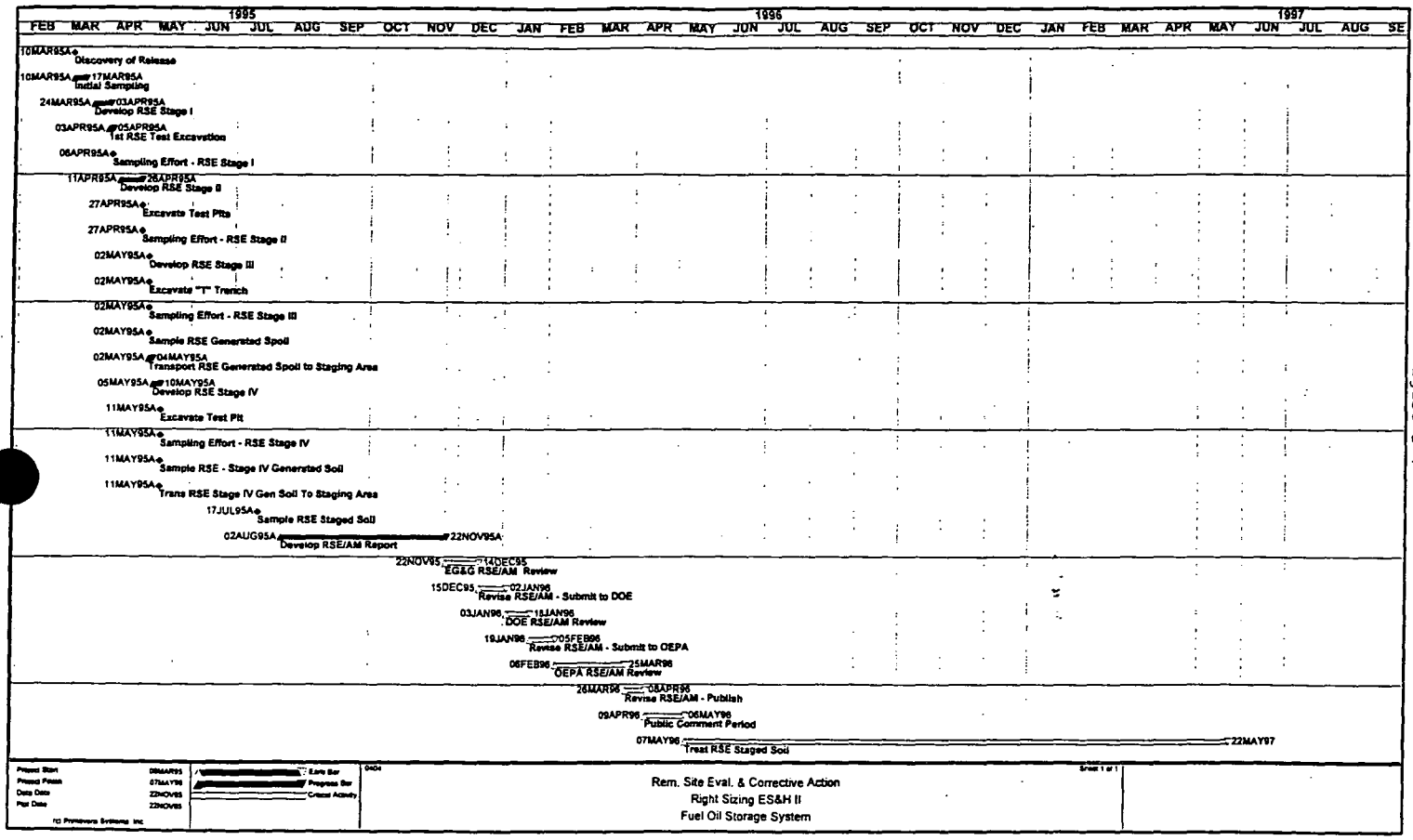

1995
1996
1997
FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SE
10MAR95A
Discovery of Release
10MAR95A 17MAR95A
Initial Sampling
24MAR95A 01APR95A
Develop RSE Stage I
03APR95A 05APR95A
1st RSE Test Excavation
06APR95A
Sampling Effort - RSE Stage I
11APR95A 26APR95A
Develop RSE Stage II
27APR95A
Excavate Test Pits
27APR95A
Sampling Effort - RSE Stage II
02MAY95A
Develop RSE Stage III
02MAY95A
Excavate "T" Trench
02MAY95A
Sampling Effort - RSE Stage III
02MAY95A
Sample RSE Generated Spoil
02MAY95A 04MAY95A
Transport RSE Generated Spoil to Staging Area
05MAY95A 10MAY95A
Develop RSE Stage IV
11MAY95A
Excavate Test Pit
11MAY95A
Sampling Effort - RSE Stage IV
11MAY95A
Sample RSE - Stage IV Generated Soil
11MAY95A
Trans RSE Stage IV Gen Soil To Staging Area
17JUL95A
Sample RSE Staged Soil
02AUG95A 22NOV95A
Develop RSE/AM Report
22NOV95 14DEC95
EG&G RSE/AM Review
15DEC95 02JAN96
Revise RSE/AM - Submit to DOE
03JAN96 18JAN96
DOE RSE/AM Review
19JAN96 05FEB96
Revise RSE/AM - Submit to OEPA
06FEB96 25MAR96
OEPA RSE/AM Review
26MAR96 08APR96
Revise RSE/AM - Publish
09APR96 06MAY96
Public Comment Period
07MAY96 22MAY97
Treat RSE Staged Soil
Project Start 08MAR95
Project Finish 07MAY96
Data Date 22NOV95
Plot Date 22NOV95
Early Bar
Progress Bar
Critical Activity
0404
Sheet 1 of 1
Rem. Site Eval. & Corrective Action
Right Sizing ES&H II
Fuel Oil Storage System

Figure 5-1

5.2. ESTIMATED COSTS

The cost estimate to perform the removal action is shown in Table V.1. Costs include the construction activities, all engineering and construction management, waste disposal, and site restoration.

Table V.1. Removal Action Cost Estimated

Activity	Cost ($x1000)
Engineering/Project Management	35
Excavation/Site Closure	100
Treatment/Disposal	90
Total	225

6. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Contamination in the subject area poses a potential threat to public health and welfare and the environment because:

- fuel oil contamination has spread to surrounding soils;
- fuel oil contamination potentially threatens groundwater; and
- the source of the fuel oil contamination has uncertainty associated with it regarding quantity of contaminated soil and extent of lateral migration.

Without action taken to remove the contaminated soils, further migration of fuel oil into surrounding soils and potential migration into groundwater was likely.

7. OUTSTANDING POLICY ISSUES

There are currently no outstanding policy issues affecting performance of this removal action.

8. ENFORCEMENT

The DOE is the sole party responsible for the clean-up of contaminated soils in the subject fuel oil tank closure areas. Therefore, DOE is undertaking the role of lead agency, per the CERCLA and NCP, for the performance of this removal action. The funding for this removal action will be through DOE budget authorization and no Superfund monies will be required.

9. REFERENCES

U.S. EPA. 1990. Superfund Removal Procedures Action Memorandum Guidance. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency. December 1990.

APPENDIX A

AGREEMENT LETTERS

FOR

TREATED SOILS RELEASE LEVELS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

October 13, 1995

HSF-5J

Mr. Arthur Kleinrath
U.S. Department of Energy
Dayton Area Office
P.O. Box 66
Miamisburg, OH 45343-0066

RE: U.S. DOE Mound Plant
Operable Unit #5
Fire Fighter Training Area
Soil Cleanup Levels and Sampling Procedure

Dear Mr. Kleinrath:

The United States Environmental Protection Agency (U.S. EPA) has received your correspondence dated September 14, 1995 concerning the treatment of soils generated from the Fire Fighter Training Area (FFTA) and Fuel Oil Storage Removal Actions. Your letter states that DOE plans to treat all soils in these areas to a Total Petroleum Hydrocarbon (TPH) concentration of 105 parts per million (ppm) instead of the previously proposed level of 40 ppm.

U.S. EPA has determined that the 105 ppm cleanup level is consistent with the most stringent BUSTR action level in the BUSTR corrective action rule. Therefore, U.S. EPA concurs with the 105 ppm cleanup goal for TPH in soils from the FFTA and Fuel Oil Storage Removal Action. In addition, U.S. EPA agrees that the cleanup levels for BTEX remain as they are stated in your September 14, 1995 letter.

U.S. EPA concurs with the sampling methods for TPH and BTEX as proposed in your September 14, 1995, correspondence. In addition, U.S. EPA concurs that soils sampled prior to staging for treatment with TPH concentrations below 105 ppm and BTEX concentrations below the criteria specified in your September 14, 1995, letter would not require bioremedation treatment.

If you have any questions, please call me at (312) 886-5787.

Sincerely,

Timothy J. Fischer

Timothy J. Fischer
Remedial Project Manager

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Recycled Paper (40

cc: Brian Nickel, OEPA
Monte Williams, EG&G
Gary Coons, EG&G
Alan Spesard, US DOE
Jim Zahora, EG&G
Alec Bray, EG&G

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
East Fifth Street
ton, Ohio 45402-2911
(513) 285-6357
FAX (513) 285-6249

George V. Voinovich
Governor

October 3, 1995

RE: DOE MOUND
OU5 FFTA AND FUEL OIL TANK
REMOVAL TPH LEVEL AND
SAMPLING PROCEDURE

Arthur W. Kleinrath
DOE Miamisburg Area Office
P.O. Box 66
1 Mound Road
Miamisburg, Ohio 45343-0066

Dear Mr. Kleinrath:

The Ohio Environmental Protection Agency (Ohio EPA) has received your correspondence dated September 14, 1995, concerning the treatment of soils generated from the Fire Fighter Training Area (FFTA) and Fuel Oil Storage Removal Actions. This correspondence states that DOE will now treat all soils from the FFTA and the fuel oil tank removal to a Total Petroleum Hydrocarbon (TPH) value of 105 parts per million (ppm) instead of the previously proposed value of 40 ppm.

The correspondence references a letter from Donald R. Schregardus, Director, Ohio EPA, to "Interested Parties" dated February 4, 1993, concerning the interim final Ohio EPA Policy PP 01 03 200 *Petroleum Contaminated Soils*. The policy lists in Table II, "Analytical Evaluation of the Contaminated Soil or Post-Treatment Residual to Determine Status as a Non-Regulated Material" the concentration limit of 40.0 ppm for TPH, as per analytical methods EPA Method 8015 for gasolines and EPA Method 418.1 for all other fuels. This level is now 105 ppm for TPH as per Director Schregardus' letter, in which it states the policy is now consistent with BUSTR's Class I (most stringent) action level in BUSTR's corrective action rule. Therefore, Ohio EPA acknowledges that DOE will now treat all soils from the FFTA and fuel oil tank removal in accordance with the policy to a level of 105 ppm TPH, using the required analytical methods stated above. DOE is correct in recognizing that the levels of BTEX remain the same, as per its September 14, 1995 correspondence.

DOE also discusses a clarification of its operating procedures for sampling the soils stockpiled next to the bioremediation treatment pads. DOE proposes that soils sampled for TPH and BTEX prior to placement on the treatment pads be omitted from bioremediation treatment if TPH is less than 105 ppm and BTEX levels are below the criteria referenced in the September 14, 1995 correspondence. Ohio EPA concurs with this clarification when the sampling of these soils meets

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the "Sampling Procedure of Staged Soils at the Bioremediation Facility for TPH & BTEX" as attached to DOE's September 14, 1995 letter and as discussed with Mr. Alan Spesard of your staff on Tuesday, October 3, 1995.

Please give me a call if there are any questions or comments at (513) 285-6468.

Sincerely,

Brian Nickel
Mound Project Manager
Office of Federal Facilities Oversight

cc: T. Fischer, USEPA Region V
A. Spesard, DOE MB
M. Williams, EG&G
J. Zahora, EG&G
G. Goons, EG&G
A. Bray, EG&G
R. Beaumier, OEPA/DERR
R. Vandegrift, ODH/BRH

4. BUSTR Project File - Removal of Underground Oil Storage Tanks (PRS 114/115/116/117)

Terry G/K
FYI

o u n d Electronic Message/AOS

From :EDWARD M. SPANGLER EMS
SPANEM
Dept. :OPERATIONS
Tel. No :X-3528
Date :12-Apr-1995 02:24pm EST
Subject :Fuel Oil Project - Lab Reports

BWS&C has returned favorable laboratory reports for the soil samples taken under the three powerhouse tanks and in the side walls of the excavation site.

As stated before, the soil clean-up action level would follow the BUSTR regulations of 642 ppm Total Petroleum Hydrocarbon (TPH).

Kirby Burton, BWS&C, sampled the excavation site Thursday, April 6, 1995. Per BUSTR, three field screen samples were conducted under each removed tank, one at each end (east, west) and one in the middle. The highest field test sample was forwarded to Hayden Environmental Group for analysis. In addition, BWS&C was asked by ER to sample two locations in the exposed sidewalls (east, south, and west) of the excavation at a vertical elevation equal to the tank bottoms. The field screens showed little trace of TPH. Kirby therefore submitted only the highest field screen sidewall sample, from the south sidewall, rather than a sample for each of the three sidewall tested. Samples for the east and west sidewall remain available for testing if desired.

HEG Sample #	Sample ID	TPH* ppm	Fuel Oil Project Tank #
9503827	Tank 1, MID	320	Day Tank No. 4
9503828	Tank 2, WEST	370	Day Tank No. 3
9503829	Tank 3, EAST	58	Day Tank No. 2
9503830	South Sidewall	25	---NA----

*Laboratory TPH reports for the highest field screen samples.

Gary, two areas of concern on the sidewalls were the culvert sleeve housing the original supply lines (1947 - 1966) and the location where the 4" drain tile exits the excavation. I will update you further after consultation with BWS&C.

Based upon these results, I will be proceeding with the back filling operations in preparation for new construction.

If you have questions or comments please contact me at X-3528.

Ed Spangler
Project Manager

LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8755 Gander Creek
Miamisburg, OH 45342

Page 1
Report Date : 04/11/95
HEG Task # : 95040055
HEG P/N, Acct:

P.O. Number:
Proj Name: Hound Fuel Oil

Date Received: 04/07/95
Proj #: 18304-02

HEG Sample # : 9503527 Sample Date: 04/06/95 Sample Priority: Emergency
Sample ID : Tank 1, Mid
(Tank 4)

Parameter	Units		Results	Comments
				3 field scan Highest field scan sent to Lab
Total Petroleum Hydrocarbons 418.1	mg/kg		320	
BTEX by SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		117	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg		3.3	27
Benzo(a)anthracene	mg/kg		1.0	27
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg		1.2	27
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg		1.2	27
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg		5.2	27
Fluoranthene	mg/kg		3.3	27
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg		5.2	27
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg		2.5	
Pyrene	mg/kg		1.0	27

HAYDEN

LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8765 Gander Creek
Miamisburg, OH 45342

Page 2
Report Date : 04/11/95
HEG Task # : 95040055
HEG P/N, Acct:

HEG Sample # : 9503020 Sample Date: 04/06/95 Sample Priority: Emergency
Sample ID : Tank 2, West

tank 3

3 field screens
Highest field scan
sent to lab

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		370	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		99.6	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg		1.6	
Anthracene	mg/kg		1.7	27
Benzo(a)anthracene	mg/kg		1.8	27
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg		2.3	27
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg		2.3	27
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg		1.7	27
Fluorene	mg/kg		1.6	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg		3.5	
Pyrene	mg/kg		1.8	27

HAYDEN

LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8755 Gander Creek
Miamisburg, OH 45342

Page 3
Report Date : 04/11/95
HEG Task # : 95040055
HEG P/N, Acct:

HEG Sample # : 9503829 Sample Date: 04/06/95 Sample Priority: Emergency
Sample ID : Tank 3, East

tank 2

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		58	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		95	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg		2.5	27
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg		1.8	27
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg		1.8	27
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg		7.9	27
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg		7.9	27
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg		2.5	27

3 Field Screens
Highest field Scan
Sent to Lab

HAYDEN

LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8755 Gander Creek
Miamisburg, OH 45342

Page 4
Report Date : 04/11/95
HEG Task # : 95040055
HEG P/N, Acct:

E, W, S all side walls expo
Field Scans were background

HEG Sample # : 9503830 Sample Date: 04/06/95 Sample Priority: Emergency
Sample ID : South Sidewall

South wall's High Field scans

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg	<	25	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg		2.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		115	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg		0.9	27
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg		0.9	27
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg		1.1	27
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg		1.1	27
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

27 These compounds coelute

Two areas of high field screens not sent to lab
1) Where culvert pipe enter powerhouse
2) where drainage pipe Exits site

Check w/ Gary Coors as to what Kirby should do with the samples

HAYDEN

FORE Testing Laboratories Inc.

6015 Manning Road
Miamisburg, Ohio 45342

513 866-5908 Tel
800 YOUR LAB or 800 968-7522
513 866-9505 Fax

PRELIMINARY FAX RESULTS

Attached are the preliminary analytical results for the sample submitted on 5/2/95. These results are subject to change pending final release.

Please deliver this to: Kerby Burton

This FAX is from: FORE TESTING LABORATORIES, INC.
Client Services Department
6015 Manning Road
Miamisburg, OH 45342
Phone: (513) 866-5908
Fax: (513) 866-9505

This FAX was created on 5/9/95 and contains 13 page(s), including this cover sheet.

T5 T4 T6
T3
T2
T1

DRAFT LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
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8755 Gander Creek
Miamisburg, OH 45342

Page 1
Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

P.O. Number:
Proj #: 18304-02

Date Received: 05/02/95

HEG Sample # : 9504602 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : T-1

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		190	02
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	02
Toluene	ug/kg		4.6	
Ethylbenzene	ug/kg		0.2	
Xylenes	ug/kg		0.3	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				01
2-Fluorobiphenyl	%		86	02
Acenaphthene	mg/kg	<	7.9	
Acenaphthylene	mg/kg	<	3.7	
Anthracene	mg/kg	<	9.2	
Benzo(a)anthracene	mg/kg	<	6.0	
Benzo(a)pyrene	mg/kg	<	11	
Benzo(b)fluoranthene	mg/kg	<	7.0	
Benzo(ghi)perylene	mg/kg	<	8.6	
Benzo(k)fluoranthene	mg/kg	<	7.0	
Chrysene	mg/kg	<	6.6	
Dibenzo(a,h)anthracene	mg/kg	<	16	
Fluoranthene	mg/kg	<	4.2	
Fluorene	mg/kg	<	6.1	
Indeno(1,2,3-cd)pyrene	mg/kg	<	16	
Naphthalene	mg/kg	<	3.2	
Phenanthrene	mg/kg	<	6.1	
Pyrene	mg/kg	<	5.5	

DRAFT LABORATORY ANALYSIS REPORT

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Page 2
Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504603 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : T-2

Parameter	Units	Results		Comments
Total Petroleum Hydrocarbons 418.1	mg/kg	<	25	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	02
Toluene	ug/kg		12	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		83	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Page 3
Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504604 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : T-3

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		52	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	02
Toluene	ug/kg		1.7	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		79	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

DRAFT LABORATORY ANALYSIS REPORT

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Page 4
Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

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HEG Sample # : 9504605 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : T-4

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		38	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	02
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		71	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504606 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : T-5

Parameter	Units	Results		Comments
Total Petroleum Hydrocarbons 418.1	mg/kg	<	25	
BTEX By SW846-8020				
Benzene	ug/kg	<	3.0	02
Toluene	ug/kg		106	65
Ethylbenzene	ug/kg	<	2.0	
Xylenes	ug/kg	<	2.0	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		86	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Page 6
Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

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HEG Sample # : 9504607 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : T-6

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		32	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	02
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		87.3	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504608 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : P-1

Pile (Trench 5)

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		57	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	02
Toluene	ug/kg		2.6	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		71.1	01
Acenaphthene	mg/kg	<	7.90	
Acenaphthylene	mg/kg	<	3.70	
Anthracene	mg/kg	<	9.20	
Benzo(a)anthracene	mg/kg	<	6.00	
Benzo(a)pyrene	mg/kg	<	10.90	
Benzo(b)fluoranthene	mg/kg	<	7.00	
Benzo(ghi)perylene	mg/kg	<	8.60	
Benzo(k)fluoranthene	mg/kg	<	7.00	
Chrysene	mg/kg	<	6.60	
Dibenzo(a,h)anthracene	mg/kg	<	16.50	
Fluoranthene	mg/kg	<	4.20	
Fluorene	mg/kg	<	6.10	
Indeno(1,2,3-cd)pyrene	mg/kg	<	16.50	
Naphthalene	mg/kg	<	3.20	
Phenanthrene	mg/kg	<	6.10	
Pyrene	mg/kg	<	5.50	

DRAFT LABORATORY ANALYSIS REPORT

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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504609 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : P-2

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		53	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.6	65
Toluene	ug/kg		23	02
Ethylbenzene	ug/kg	<	0.4	
Xylenes	ug/kg	<	0.4	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		73.5	01
Acenaphthene	mg/kg	<	7.90	
Acenaphthylene	mg/kg	<	3.70	
Anthracene	mg/kg	<	9.20	
Benzo(a)anthracene	mg/kg	<	6.00	
Benzo(a)pyrene	mg/kg	<	10.90	
Benzo(b)fluoranthene	mg/kg	<	7.00	
Benzo(ghi)perylene	mg/kg	<	8.60	
Benzo(k)fluoranthene	mg/kg	<	7.00	
Chrysene	mg/kg	<	6.60	
Dibenzo(a,h)anthracene	mg/kg	<	16.50	
Fluoranthene	mg/kg	<	4.20	
Fluorene	mg/kg	<	6.10	
Indeno(1,2,3-cd)pyrene	mg/kg	<	16.50	
Naphthalene	mg/kg	<	3.20	
Phenanthrene	mg/kg	<	6.10	
Pyrene	mg/kg	<	5.50	

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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

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HEG Sample # : 9S04610 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : P-3

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		50	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		15	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		78.6	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Mr. Kerby Burton
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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504611 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : P-4

Parameter	Units	Results		Comments
Total Petroleum Hydrocarbons 418.1	mg/kg	<	25	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		7.6	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		94.5	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504612 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : P-5

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		26	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		0.5	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		84.6	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

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Date : 05/09/95
HEG Task # : 95050017
HEG P/N, Acct:

HEG Sample # : 9504613 Sample Date: 05/02/95 Sample Priority: Emergency
Sample ID : P-6

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		76	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		5.7	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	
Polynuclear Aromatic Hydrocarbons 8100				
Quality Control				
2-Fluorobiphenyl	%		69.4	
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	

02 Sample matrix interferences

01 Sample analyzed using a dilution, thus a higher MDL

65 Sample analyzed using a dilution

(10304-02)

FORE
Testing Laboratories Inc.

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Big F.O. file
Final Sampling
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August 2, 1995

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AUG 04 1995

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8755 Gander Creek
Miamisburg, OH 45342

Subject: FTL Task Number 95070162
FTL Sample Number(s) 9507484 - 9507489

Project # : 18304-02
Project Name: Fuel Oil Right Sizing

Dear Mr. Burton:

Thank you for choosing FORE Testing Laboratories for your environmental or industrial hygiene laboratory needs. We are pleased to present this analytical report for the sample(s) you submitted to our laboratory July 18, 1995.

If you have any questions regarding the results or if you need additional information pertaining to the analyses, please contact one of the persons listed below at 513/866-5908. We can provide additional report copies, method summaries or quality control data reports that you may require for full documentation of your samples. Please request pricing for these additional reports.

We hope to continue to provide you with quality analytical services and support. If you have any comments on the services we have provided, we would appreciate hearing from you.

Sincerely,

FORE TESTING LABORATORIES, INC.

Rebecca F. Tipps
QA/QC Officer

Larry Hemsley
Client Service Representative

cc: Client File

LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8755 Gander Creek
Miamisburg, OH 45342

Page 1
Report Date : 08/02/95
HEG Task # : 95070162
HEG P/N, Acct:

P.O. Number: 18304-02
Proj Name: Fuel Oil Right Sizing

Date Received: 07/18/95
Proj #: 18304-02

HEG Sample # : 9507484 Sample Date: 07/17/95 Sample Priority: Normal
Sample ID : FO-P10

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		88	
Polynuclear Aromatic Hydrocarbons 8100				
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	

LABORATORY ANALYSIS REPORT

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Report Date : 08/02/95
HEG Task # : 95070162
HEG P/N, Acct:

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HEG Sample # : 9507485 Sample Date: 07/17/95 Sample Priority: Normal
Sample ID : FO-P11

Parameter	Units	Results		Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		580	
Polynuclear Aromatic Hydrocarbons 8100				
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	

LABORATORY ANALYSIS REPORT

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Page 3
Report Date : 08/02/95
HEG Task # : 95070162
HEG P/N, Acct:

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HEG Sample # : 9507486 Sample Date: 07/17/95 Sample Priority: Normal
Sample ID : FO-P12

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		864	
Polynuclear Aromatic Hydrocarbons 8100				02, 65
Acenaphthene	mg/kg	<	7.9	
Acenaphthylene	mg/kg	<	3.7	
Anthracene	mg/kg	<	9.2	
Benzo(a)anthracene	mg/kg		27	27
Benzo(a)pyrene	mg/kg		114	
Benzo(b)fluoranthene	mg/kg		391	27
Benzo(ghi)perylene	mg/kg	<	8.6	
Benzo(k)fluoranthene	mg/kg		391	27
Chrysene	mg/kg	<	6.6	
Dibenzo(a,h)anthracene	mg/kg	<	16	
Fluoranthene	mg/kg	<	4.2	
Fluorene	mg/kg	<	6.1	
Indeno(1,2,3-cd)pyrene	mg/kg	<	16	
Naphthalene	mg/kg	<	3.2	
Phenanthrene	mg/kg	<	6.1	
Pyrene	mg/kg		27	27
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		0.4	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	

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LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
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8755 Gander Creek
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Page 4
Report Date : 08/02/95
HEG Task # : 95070162
HEG P/N, Acct:

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HEG Sample # : 9507487 Sample Date: 07/17/95 Sample Priority: Normal
Sample ID : FO-P16

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		222	
Polynuclear Aromatic Hydrocarbons 8100				02, 65
Acenaphthene	mg/kg	<	7.9	
Acenaphthylene	mg/kg	<	3.7	
Anthracene	mg/kg	<	9.2	
Benzo(a)anthracene	mg/kg		11	27
Benzo(a)pyrene	mg/kg	<	11	
Benzo(b)fluoranthene	mg/kg		244	27
Benzo(ghi)perylene	mg/kg	<	8.6	
Benzo(k)fluoranthene	mg/kg		244	27
Chrysene	mg/kg		25	
Dibenzo(a,h)anthracene	mg/kg	<	16	
Fluoranthene	mg/kg	<	4.2	
Fluorene	mg/kg	<	6.1	
Indeno(1,2,3-cd)pyrene	mg/kg	<	16	
Naphthalene	mg/kg	<	3.2	
Phenanthrene	mg/kg	<	6.1	
Pyrene	mg/kg		11	27
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		0.6	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	

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LABORATORY ANALYSIS REPORT

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8755 Gander Creek
Miamisburg, OH 45342

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Report Date : 08/02/95
HEG Task # : 95070162
HEG P/N, Acct:

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HEG Sample # : 9507488 Sample Date: 07/17/95 Sample Priority: Normal
Sample ID : FO-P17

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		31	
Polynuclear Aromatic Hydrocarbons 8100				
Acenaphthene	mg/kg	<	0.79	
Acenaphthylene	mg/kg	<	0.37	
Anthracene	mg/kg	<	0.92	
Benzo(a)anthracene	mg/kg	<	0.60	
Benzo(a)pyrene	mg/kg	<	1.09	
Benzo(b)fluoranthene	mg/kg	<	0.70	
Benzo(ghi)perylene	mg/kg	<	0.86	
Benzo(k)fluoranthene	mg/kg	<	0.70	
Chrysene	mg/kg	<	0.66	
Dibenzo(a,h)anthracene	mg/kg	<	1.65	
Fluoranthene	mg/kg	<	0.42	
Fluorene	mg/kg	<	0.61	
Indeno(1,2,3-cd)pyrene	mg/kg	<	1.65	
Naphthalene	mg/kg	<	0.32	
Phenanthrene	mg/kg	<	0.61	
Pyrene	mg/kg	<	0.55	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg		0.2	57
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	

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LABORATORY ANALYSIS REPORT

Mr. Kerby Burton
BARGE, WAGGONER, SUMNER & CANNON
8755 Gander Creek
Miamisburg, OH 45342

Page 6
Report Date : 08/02/95
HEG Task # : 95070162
HEG P/N, Acct:

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HEG Sample # : 9507489 Sample Date: 07/17/95 Sample Priority: Normal
Sample ID : FO-P18

Parameter	Units		Results	Comments
Total Petroleum Hydrocarbons 418.1	mg/kg		155	
Polynuclear Aromatic Hydrocarbons 8100				02, 65
Quality Control				
2-Fluorobiphenyl	%			
Acenaphthene	mg/kg	<	7.9	
Acenaphthylene	mg/kg	<	3.7	
Anthracene	mg/kg	<	9.2	
Benzo(a)anthracene	mg/kg	<	6.0	
Benzo(a)pyrene	mg/kg	<	11	
Benzo(b)fluoranthene	mg/kg		209	27
Benzo(ghi)perylene	mg/kg	<	8.6	
Benzo(k)fluoranthene	mg/kg		209	27
Chrysene	mg/kg	<	6.6	
Dibenzo(a,h)anthracene	mg/kg	<	16	
Fluoranthene	mg/kg	<	4.2	
Fluorene	mg/kg	<	6.1	
Indeno(1,2,3-cd)pyrene	mg/kg	<	16	
Naphthalene	mg/kg	<	3.2	
Phenanthrene	mg/kg	<	6.1	
Pyrene	mg/kg	<	5.5	
BTEX By SW846-8020				
Benzene	ug/kg	<	0.3	
Toluene	ug/kg	<	0.2	
Ethylbenzene	ug/kg	<	0.2	
Xylenes	ug/kg	<	0.2	

02 Sample matrix interferences

27 These compounds coelute

65 Sample analyzed using a dilution

57 Analyte detected at the detection limit

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Testing Laboratories Inc.

HEG / LIMS
Analysis Date Report
Report Date: 08/02/95

HEG Lab Task # 95070162
HEG Client: BARGE, WAGGONER, SUMNER & CANNON

Date Received : 07/18/95 Date Reported: 08/02/95

Sample #: 9507484 Sample Date: 07/17/95
Sample ID: FO-P10

Analysis Date	Analyst	Test Performed	Hold Time (Days)
07/27/95	bn	TPH 48HR Turnaround(Solid)	28
07/21/95	ch	PAH Solid Extraction	14
07/19/95	jep	BTEX	14
07/28/95	ksw	PAH	40

Sample #: 9507485 Sample Date: 07/17/95
Sample ID: FO-P11

Analysis Date	Analyst	Test Performed	Hold Time (Days)
07/27/95	bn	TPH 48HR Turnaround(Solid)	28
07/21/95	ch	PAH Solid Extraction	14
07/19/95	jep	BTEX	14
07/28/95	ksw	PAH	40

Sample #: 9507486 Sample Date: 07/17/95
Sample ID: FO-P12

Analysis Date	Analyst	Test Performed	Hold Time (Days)
07/27/95	bn	TPH 48HR Turnaround(Solid)	28
07/21/95	ch	PAH Solid Extraction	14
07/19/95	jep	BTEX	14
07/28/95	ksw	PAH	40

HEG / LIMS
Analysis Date Report
Report Date: 08/02/95

Sample #: 9507487 Sample Date: 07/17/95
Sample ID: FO-P16

Analysis Date	Analyst	Test Performed	Hold Time (Days)
07/27/95	bn	TPH 48HR Turnaround(Solid)	28
07/21/95	ch	PAH Solid Extraction	14
07/19/95	jep	BTEX	14
07/28/95	ksw	PAH	40

Sample #: 9507488 Sample Date: 07/17/95
Sample ID: FO-P17

Analysis Date	Analyst	Test Performed	Hold Time (Days)
07/27/95	bn	TPH 48HR Turnaround(Solid)	28
07/21/95	ch	PAH Solid Extraction	14
07/19/95	jep	BTEX	14
07/28/95	ksw	PAH	40

Sample #: 9507489 Sample Date: 07/17/95
Sample ID: FO-P18

Analysis Date	Analyst	Test Performed	Hold Time (Days)
07/27/95	bn	TPH 48HR Turnaround(Solid)	28
07/21/95	ch	PAH Solid Extraction	14
07/19/95	jep	BTEX	14
07/28/95	ksw	PAH	40

FORE

Testing Laboratories Inc.

6015 Manning Road • Miamisburg, Ohio 45342 • 513 866 - 5908 Tel
800 YOUR LAB (or 800 968 - 7522) • 513 866 - 9505 Fax

CHAIN-OF-CUSTODY RECORD

SEE INSTRUCTIONS ON BACK

PROJECT INFORMATION

PROJECT NAME: FUEL OIL RIGHT SIZING
PROJECT NUMBER: 18304-02
PROJECT MANAGER: KERBY BURTON
SAMPLED BY: KERBY BURTON

COMPANY: BARGE WAGGONER SUMNER & CANNON
ADDRESS: 8755 GANDER CR. DR, MIAMISBURG, OH 45342
PHONE NUMBER: 513-438-0378

TO ASSIST US IN SELECTING THE PROPER METHOD:

Is this work being conducted for regulatory compliance monitoring? YES X No ___
Is this work being conducted for regulatory enforcement action? Yes ___ No X
Which regulations apply:
RCRA ___ NPDES Wastewater ___ UST X
Other ___ Drinking Water ___ None ___

ANALYSIS — Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added

LAB USE ONLY

CUSTODY SEAL #: ___
Used ☐ yes ☒ no
in tact ☐ yes ☐ no

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	MATRIX[1]	Number of Containers	PAH METHOD 8100	TPH Method 418.1	BTEX 5030/8020								COMMENTS
FO-P10	7-17-95		Soil	2	X	X	X								
FO-P11				2	X	X	X								
FO-P12				2	X	X	X								
FO-P14				2	X	X	X								
FO-P17				2	X	X	X								
FO-P18				2	X	X	X								

Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
Kerby Burton	7-17-95	5:34 p	Donna Sexton
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
...uished by: (Signature)	DATE	TIME	Received for Laboratory by: (Signature)
			Virginia Fuelling 7/17/95

NOTES TO LAB:

MATRIX[1]: W = water, SD = solid, L = liquid, SL = sludge, O = oil, CT = charcoal tube, A = air bag

ORIGINAL

FT001a-L