

# MOUND



**Environmental  
Restoration  
Program**

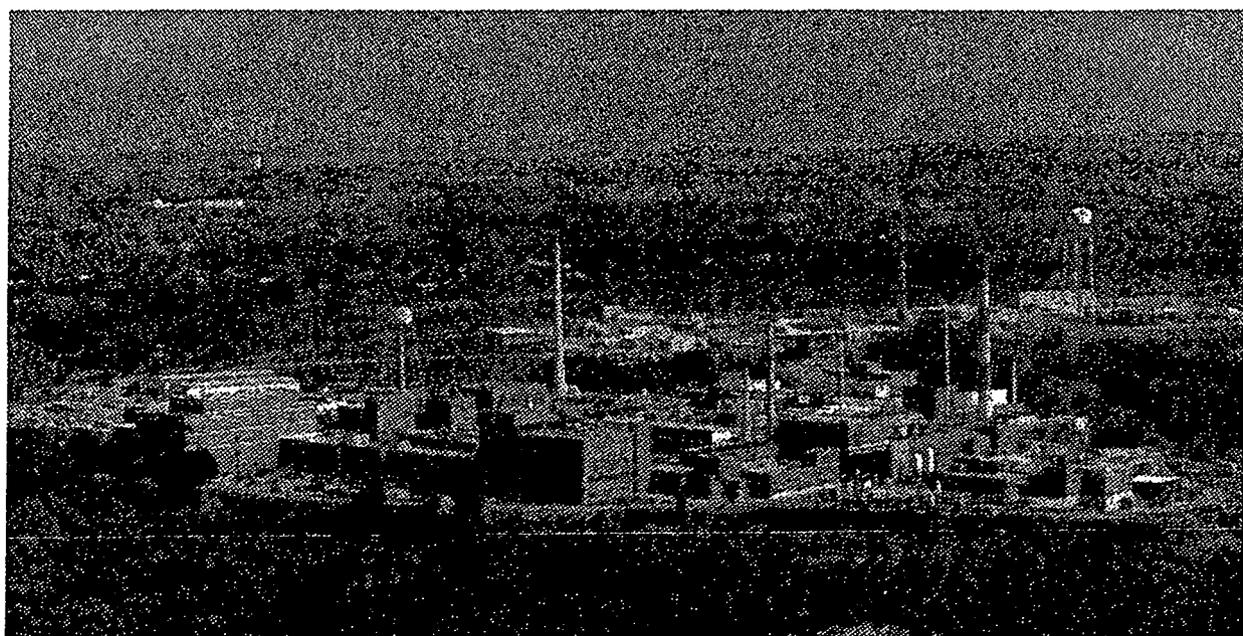


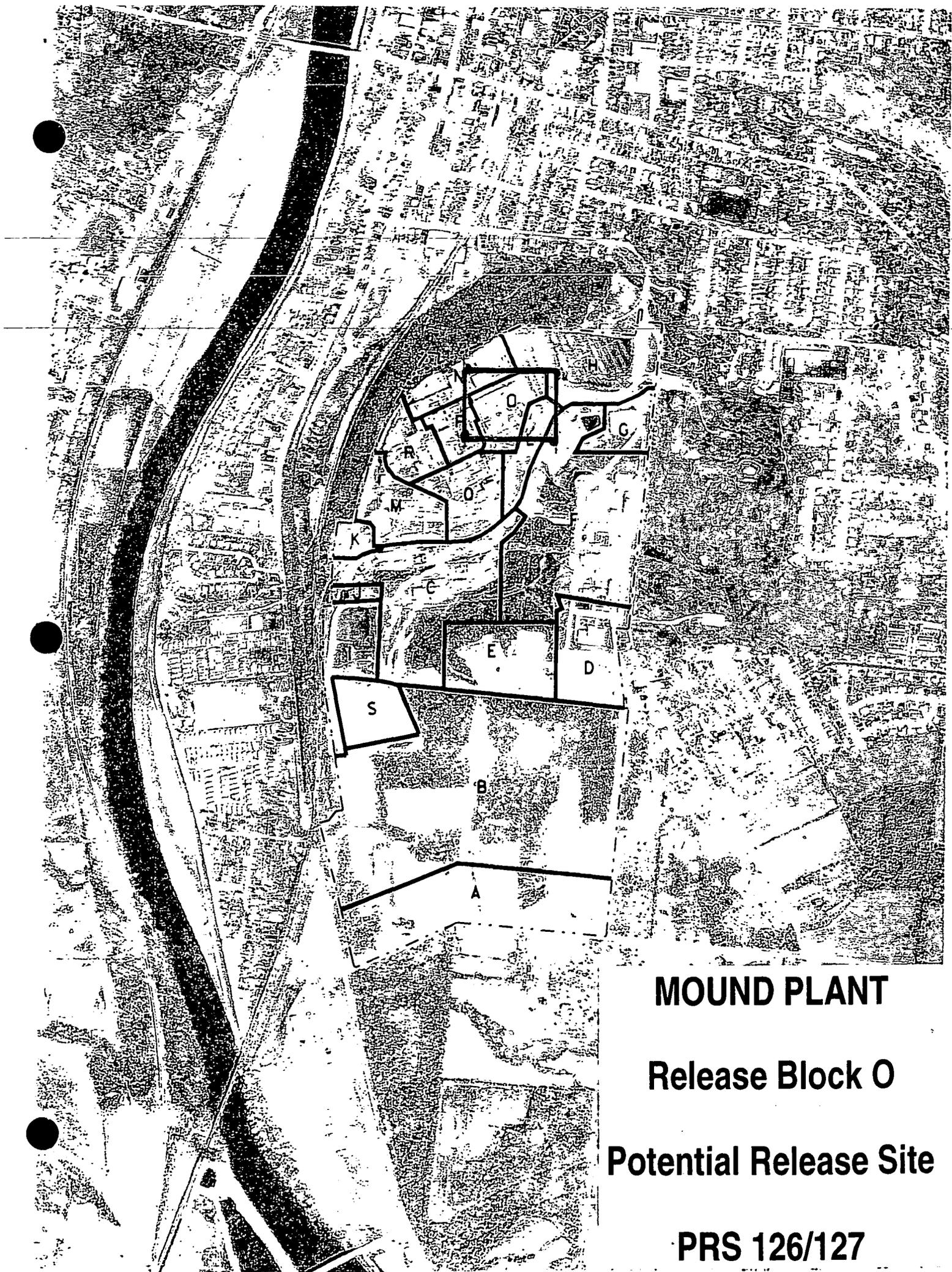
**Ohio EPA**

# MOUND PLANT

## Potential Release Site Package

### PRS # 126/127



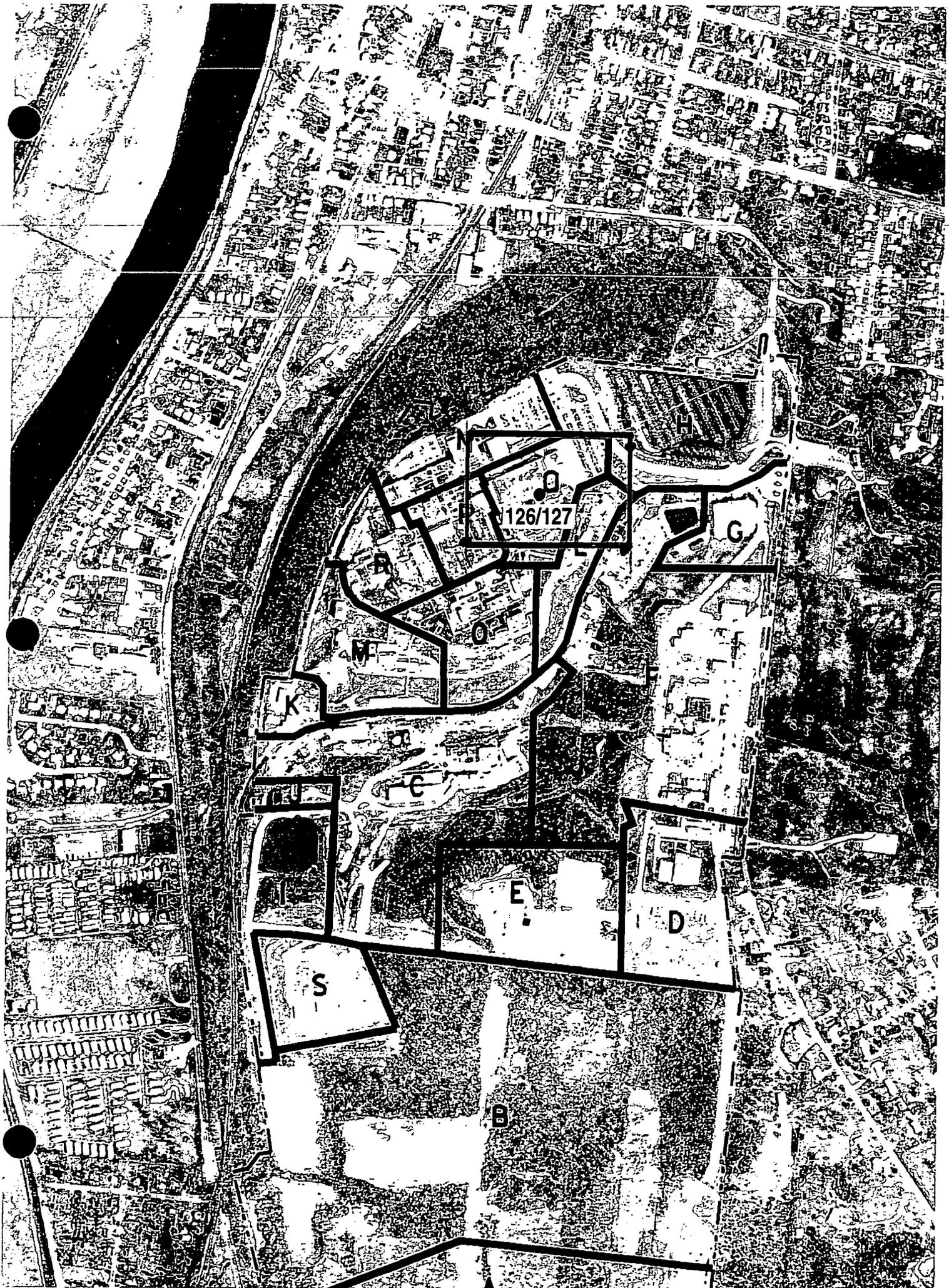


**MOUND PLANT**

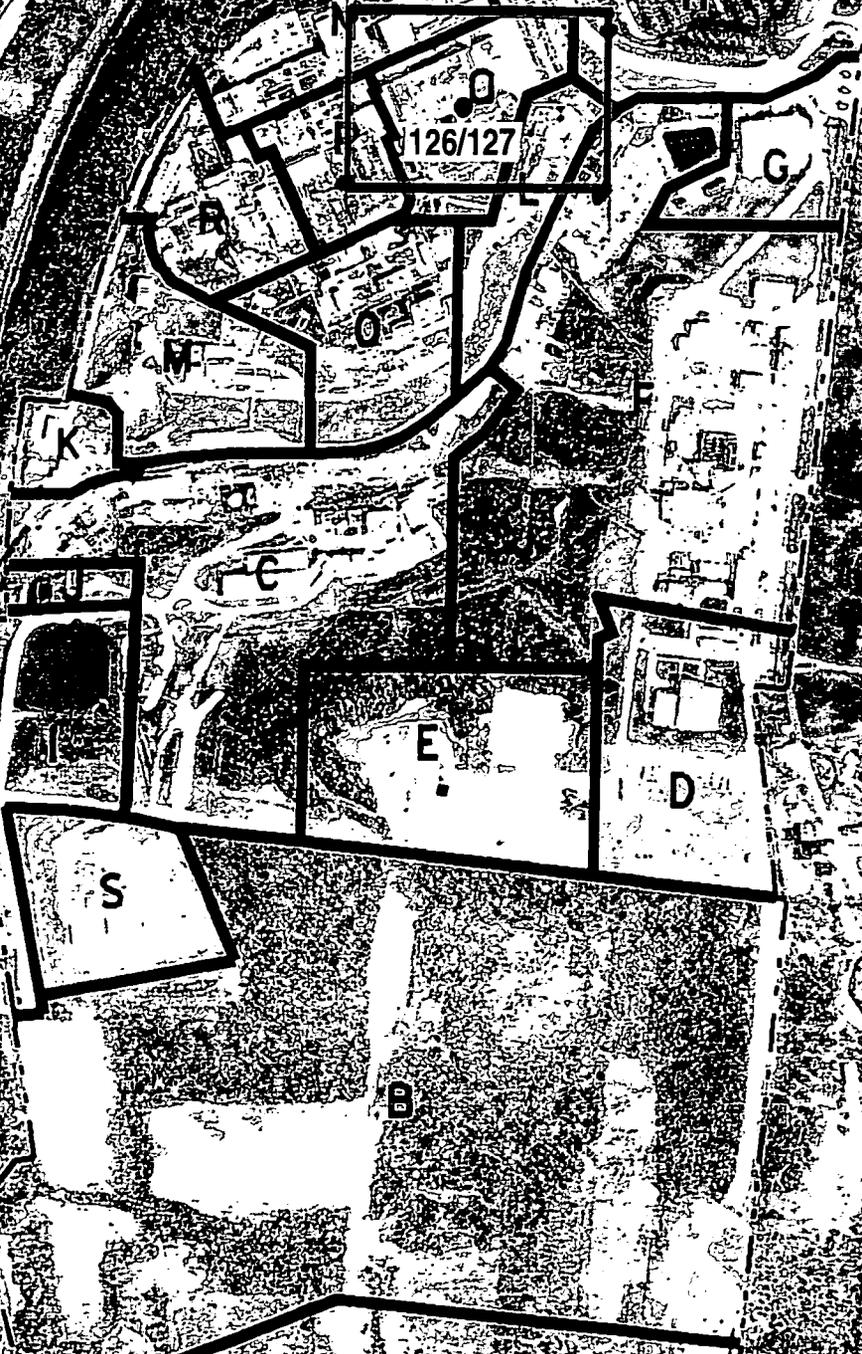
**Release Block O**

**Potential Release Site**

**PRS 126/127**

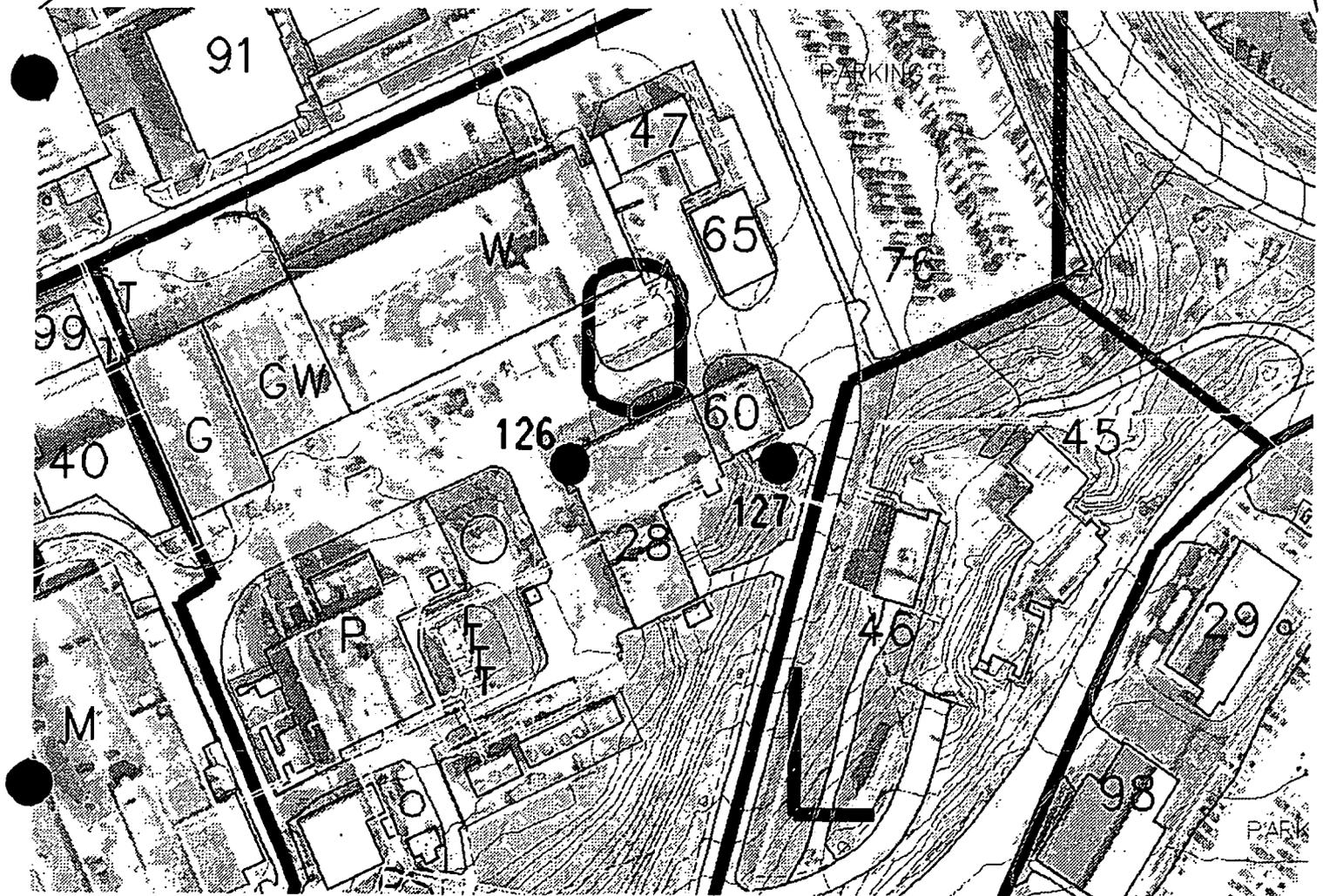
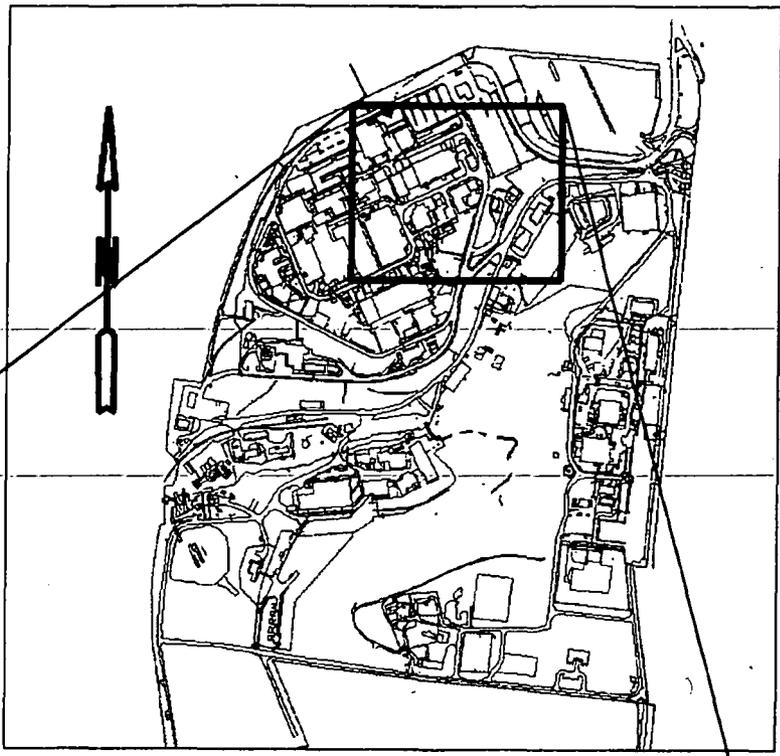


126/127

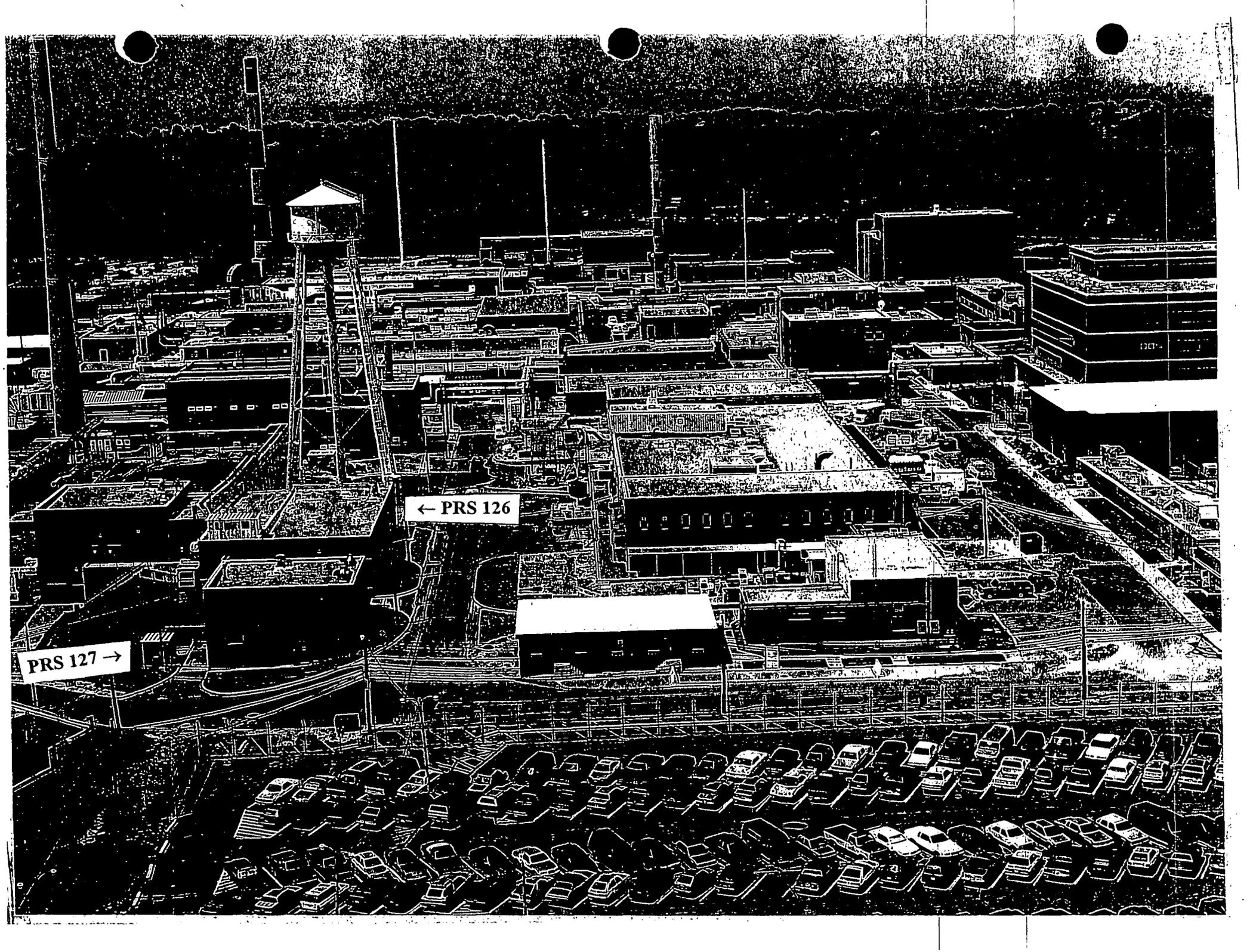


# Mound Plant Release Block 0

Potential Release Site  
**PRS 126/127**







← PRS 126

PRS 127 →

## PRS 126/127

### PRS HISTORY:

Potential Release Sites (PRSs) 126 and 127 refer to the temporary storage locations for waste solvents generated by the Building 28/60 operations.<sup>1,2,3</sup> The solvents were used in cleaning operations which involved the manufacture of glass and ceramic components for weapon programs.

PRS 126 is the concrete pad located on the west side of Building 28. One or two drums containing waste solvents were temporarily stored on this pad until full. Full waste drums were transferred to Building 72 by waste management for off-site treatment and disposal.<sup>2,3</sup> Storage of the waste solvents was relocated in 1990 to the sheet metal shed, PRS 127, which was constructed on the south side of Building 28/60. The same waste transfer procedures were used for this solvent storage shed. The full waste drums from all the Mound generator/temporary storage locations were relocated to Building 72 on a weekly basis. There are no historical records of any spill or leak of solvents from either of these PRSs.<sup>2,3</sup> The Department of Energy has made Building 28/60 and the solvent shed available to Miamisburg Mound Community Improvement Corporation (MMCIC) for a commercial lease. At the present time, only Building 28 has been leased. Mound Manufacturing Center Inc. is the tenant of this building.

### CONTAMINATION:

#### **Soil Gas Survey<sup>4</sup>**

In 1993, the Building 28/60 area was investigated for volatile organic compounds (VOCs) by gas chromatography. Samples were collected from six locations which surrounded Building 28/60 and PRS 126/127. VOCs which have Guideline Criteria for soil gas contamination were detected in all six soil gas sampling locations. The table below summarizes these results:

<b>Contaminant</b>	<b>Maximum Concentration Detected</b>	<b>Calculated Guideline Criteria<sup>6</sup></b>
Toluene	24 ppb	414600 ppb
Trichloroethene (TCE)	226 ppb	2400 ppb
1,1,1 Trichloroethane (TCA)	7 ppb	173400 ppb

Freon 11 and Freon 113 were also detected in four of the soil gas samples. The maximum concentrations of freon detected were 287 ppb (Freon 11) and 707 ppb (Freon 113). There are no guideline criteria for freon.

### **Radiological Site Survey (RSS)<sup>5</sup>**

Building 28/60 did not involve operations with radioactive materials. In 1983-84, the RSS analyzed soil samples for radioactivity. Nine surface sample locations surrounding the building and PRS 126/127 were characterized for plutonium-238 and thorium-232. There was no thorium detected (less than 2 pCi/g) in these samples. The maximum concentration of plutonium-238 was 0.55 pCi/g which is below the 25 pCi/g Mound ALARA goal.

### **READING ROOM REFERENCES:**

- 1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994.(pages 6-9)
- 2) OU9, Site Scoping Report: Volume 7 - Waste Management, February 1993. (pages 10-12)
- 3) Preliminary Review/Visual Site Inspection for RCRA Facility of Mound Plant, 1988. (pages 13-15)
- 4) Soil Gas Survey & Geophysical Investigations Main Hill and SM/PP Hill Areas, Reconnaissance Sampling Report, February 1993. (pages 16-19)
- 5) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 20-24)

### **OTHER REFERENCES:**

- 6) Comparison of Actual Soil Gas Values with Calculated Acceptable Soil Gas Values, March 1996. (pages 25-27)

### **PREPARED BY:**

David Gloekler, Member of EG&G Technical Staff

**MOUND PLANT  
PRS 126/127  
SOLVENT STORAGE SITE - OUTSIDE AREA NEXT TO  
BUILDING 28**

**RECOMMENDATION:**

Potential Release Sites (PRSs) 126 and 127 refer to the temporary storage locations for waste solvents generated by the Building 28/60 operations. The solvents were used in cleaning operations during the manufacture of weapon components. There are no historical records of any spill or leak of solvents from either of the waste solvent storage areas.

Volatile organic compounds (VOCs) were detected in the surrounding soil gas samples collected in 1993. All the VOC concentrations were below the calculated acceptable soil gas criteria. Samples analyzed for plutonium and thorium were below their respective radiological guideline criteria, 25 pCi/g for plutonium-238 (Mound ALARA) and 15 pCi/g for subsurface thorium (40 CFR 192.41). Therefore, PRSs 126/127 requires NO FURTHER ASSESSMENT.

**CONCURRENCE:**

DOE/MB:

Arthur W. Kleinrath 10/3/96  
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA:

Timothy J. Fischer 10/3/96  
Timothy J. Fischer, Remedial Project Manager (date)

OEPA:

Brian K. Nickel 10/3/96  
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 126/127**

Environmental Restoration Program

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

**MOUND PLANT  
MIAMISBURG, OHIO**

December 1994

Final

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



EG&G Mound Applied Technologies

Table A.1. Comprehensive Tabulation of Potential Release Sites

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 <sup>a</sup>	Results	Ref
118	M Building Soils	E-7	Grounds	Copper cyanide, Silver cyanide  Machine oils, Solvents	4	Oils, Copper cyanide, Silver cyanide	S	10	1  14	SGS <sup>b</sup> Table B.4 Locations 1050, 1051, 1062  Table B.9 RSS <sup>c</sup> Locations S0162, S0163, S0252 (Appendix E in Ref. 6)	12  6
119	Room M-38 Metal Plating Rinse Water Sump (Tank 225)	E-7	Surplus	Rinse waters from metal plating operations. Possible contaminants include nickel, cadmium, silver, gold, manganese, cyanide, and aluminum.  Sodium hydroxide solution Potassium permanganate	3, 4	None Suspected			No Data		
120	Room M-108 Metal Plating Rinse Water Tank (Tank 119)	E-7	In service	Rinse waters from metal plating operations. copper, gold, silver, nickel, aluminum, and uranium	3, 4	Silver cyanide	SW	10	No Data		
121	Vapor Degreasers	E-7	In service	Perclene D (perchloroethylene)	4, 5, 18	None Suspected			No Data		
122	Underground Radioactive Waste Lines (Main Hill)	E-6 F-6	Inactive	Alpha wastes from SW Bldg., R Bldg., and H Bldg.  Wastewater from B Building Plutonium-238, Cobalt-60	4, 18	Suspected	S	4, 10	No Data		
123	Area 5, Radioactive Waste Line Break	F-6 F-7	Grounds	Cobalt-60, Cesium-137, Plutonium-238	1, 5, 18	Cobalt-60	S	1, 18	2, 14, 16	Table B.1 (Table III.3 in Ref. 6)	6
124	Building 48 Hillside	F-6	Inactive	Plutonium-238		Plutonium-238	S	6	14	Table B.1	6
125	Underground Sanitary Sewer Line G24	F-6	In service	Organic solvents, Plating Solutions, Laboratory chemicals, Nitric acid, Hydrochloric acid, Methylene chloride, Strong acids and bases		Suspected	S	5, 18	3, 4, 5, 6, 14, 16	Tables B.6, B.7, and B.8	7
126	Building 28 Solvent Storage Area	E-8	Grounds	Organic solvents (including alcohol, methylene chloride, and acetone)	4, 5, 9, 18	Suspected	S	4	1	SGS <sup>b</sup> Table B.4 Location 1054	12

<sup>a</sup>Analyte List Codes

<sup>b</sup>SGS, Soil Gas Survey

<sup>c</sup>RSS, Radiological Site Survey

Table A.1. Comprehensive Tabulation of Potential Release Sites

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 <sup>a</sup>	Results	Ref
127	Building 28 Solvent Storage Shed	E-8	In Service	Organic solvents (including alcohol, methylene chloride, and acetone)	4, 5, 18	Suspected	S	4	1	SGS <sup>b</sup> Table B.4 Locations 1190 and 1231	12
128	DS Building Solvent Storage Shed	F-7	In service	Organic solvents (including 1,1,1-trichloroethane, trichlorofluoromethane, ethanol, and trichloroethane)	4, 5, 18	Suspected	S	4	1  14	SGS <sup>b</sup> Table B.4 Location 1194 No Hits  Table B.9 RSS <sup>c</sup> Location S0128 (Appendix E in Ref. 6)	12  6
129	B Building Solvent Storage Shed	E-6	Inactive	Organic solvents (including trichloroethane, trichlorofluoromethane, ethanol, methanol, isopropanol, acetone, methylene chloride, toluene)  Oils	4, 5, 18	Suspected	S	4	1  14	SGS <sup>b</sup> Table B.4 Locations 1202, 1203  Table B.9 RSS <sup>c</sup> Location S0146 (Appendix E in Ref. 6)	12  6
130	B Building Temporary Drum Storage Area	E-6	Inactive	Waste solvents, waste oil, and trash from E and B Bldgs.	4						
131	SW Building Soils	E-6 F-6	Grounds	Tritium, Radium-226, Actinium-227, Thorium-232	4, 6, 18	Tritium beneath the building	S	1, 18	14, 16	Table B.1 RSS <sup>c</sup> Locations S0154 and S0180 (Appendix E in Ref. 6)	6
132	Area 15, Entombed SW Cave (Room SW 1-B)	F-6	Historical	Radon-222, Radium-226, Actinium-227, Thorium-228	1, 4, 6, 18	Radon-222	A	1, 6	No Data		
133	SW Building Room 1-A	F-6	Historical	High-activity wastewater from radium and actinium processing, reactor waste including Radium-226, Actinium-227, Cesium-137, Plutonium-238, and Uranium-238.	4	Cesium-137 (sealed in concrete in building floor)		4	No Data		
134	SW Building Drum Storage Area	E-6	In service	Hazardous wastes  Asbestos, Waste oils, Antifreeze	4, 5, 18				14	Table B.9 RSS <sup>c</sup> Location S0180 (Appendix E in Ref. 6)	6
135	Room SW-8 Beta Wastewater Tank (Tank 20)	F-6	In service	Tritium	3, 4				No Data		

<sup>a</sup>Analyte List Codes  
<sup>b</sup>SGS, Soil Gas Survey  
<sup>c</sup>RSS, Radiological Site Survey

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

#### Reference List

1. DOE 1988 "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: Vol. 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: Vol. 3 - Radiological Site Survey (FINAL)."
7. DOE 1993c "Operable Unit 3, Misc. Sites Limited Field Investigation Report."
8. DOE 1992d "Reconnaissance Sampling Report Decontamination & Decommissioning Areas, OUG, (FINAL)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scoping Report: Vol. 9 - 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: Vol. 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 1976a, 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."

DEC

**ENVIRONMENTAL RESTORATION PROGRAM**

**OPERABLE UNIT 9  
SITE SCOPING REPORT:  
VOLUME 7 - WASTE MANAGEMENT**

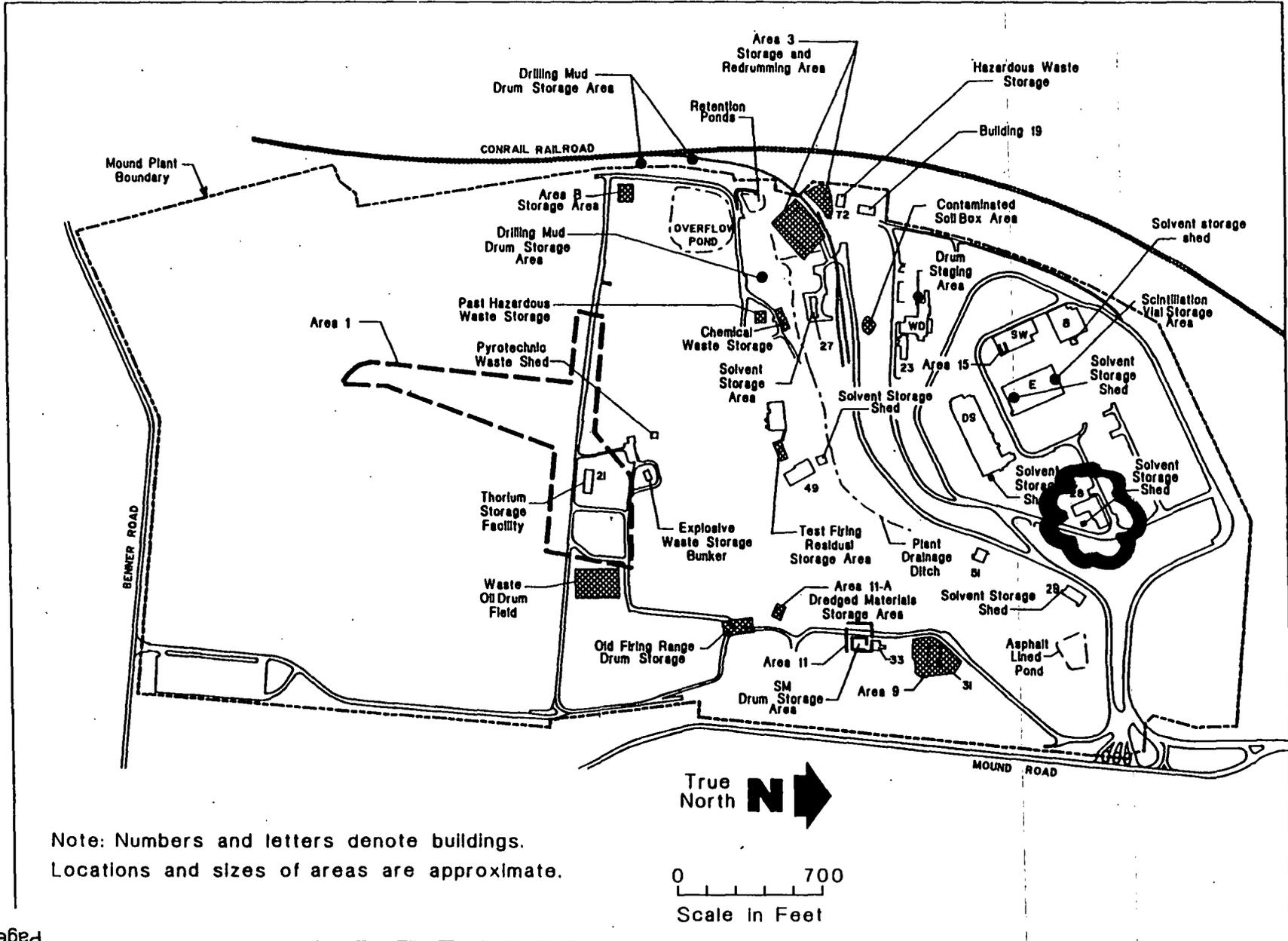
**MOUND PLANT  
MIAMISBURG, OHIO**

**July 1992**

**DEPARTMENT OF ENERGY  
ALBUQUERQUE FIELD OFFICE**

**ENVIRONMENTAL RESTORATION PROGRAM  
TECHNICAL SUPPORT OFFICE  
LOS ALAMOS NATIONAL LABORATORY**

**DRAFT FINAL  
(REVISION 0)**



Note: Numbers and letters denote buildings.  
Locations and sizes of areas are approximate.

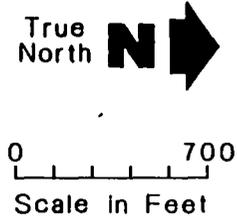


Figure 5.1 Waste storage areas.

#### 5.3.4. Building 28 Solvent Storage Area

The Building 28 solvent storage area is a sheet metal building on a concrete pad located on the ~~east~~ <sup>south</sup> side of Building 28, on the Main Hill, in the north-central portion of Mound (Figure 5.1). Historically, waste solvents were pumped from Building 28 into drums located on a concrete pad on the ~~south~~ <sup>west</sup> side of the building. There was no curbing or controls to contain releases. In 1990, a solvent storage building was constructed to contain the drums. Solvents used in Building 28 are now stored in the new building. The solvents consist of alcohol, acetone, and dichloromethane. The alcohol and dichloromethane are pumped from drums into Building 28 through stainless steel lines. The acetone is stored in bottles. Once used in the building, the solvents are returned through copper lines to waste drums in the solvent storage shed. The drums are equipped with sensors to automatically shut off the solvent flow when full (Koons 1991). Drummed waste solvent is transferred as required to the hazardous waste storage area in Building 72 near the western edge of the Mound boundary (MRC 1983). In 1989, approximately 800 gallons of waste solvents were generated in Building 28 (Fentiman 1990).

#### ~~5.3.5. DS Building Solvent Storage Shed~~

~~The DS Building solvent storage shed is on the east side of DS Building on the Main Hill, in the north-central portion of Mound (Figure 5.1). The shed was built in the early 1970s and is still in operation. The shed is a completely enclosed structure of approximately 10 ft by 10 ft, with a 12-ft ceiling equipped with a fan for ventilation. It has a concrete floor and a sealed drain with an unknown point of discharge, although a storm drain is near the shed. The concrete floor is curbed and covered with a metal grate. The curbing was not installed until 1987, at which time the drain was sealed. Historically, solvents were stored in 5-gallon cans within the building and picked up and delivered by laborers. The shed now receives waste solvent from the DS Building and also contains product-grade solvent to be used in the building. Waste solvent is pumped from the DS Building into sealed 55-gallon drums in the storage shed through automatic discharge hoses that are equipped with automatic shutoff devices. During a 1990 site visit, two drums of waste solvents composed of 1,1,1-trichloroethane, trichlorofluoromethane, and trichloroethene; and product-grade solvents including one drum of 1,1,1-trichloroethane, two drums of trichlorofluoromethane, and one drum of ethyl alcohol, were found (DOE 1992g). Drummed waste solvent is transferred as required to the hazardous waste storage area in Building 72 near the western edge of the Mound boundary (MRC 1983).~~

PRELIMINARY REVIEW/VISUAL SITE INSPECTION

U.S. DOE MOUND  
Miamisburg, Ohio

EPA I.D. OH6899008984

PREPARED FOR

U.S. ENVIRONMENTAL PROTECTION AGENCY  
REGION V  
230 SOUTH DEARBORN STREET  
CHICAGO, IL 60604

PREPARED BY

A. T. KEARNEY, INC.  
225 REINEKERS LANE  
ALEXANDRIA, VA 22313

AND

DPRA, INC.  
245 EAST 6TH STREET  
SUITE 813  
ST. PAUL, MN 55101

EPA CONTRACT NUMBER 68-01-7374

WORK ASSIGNMENT NUMBER R25-01-21

JULY 1988

Unit No.: CS-3

Unit Name: Building 28 Solvent Storage Area

Unit Description: This solvent storage area consists of two 55-gallon drums located on a concrete pad on the west side of Building 28. Waste solvent is pumped from inside the building to the drums automatically. Filled drums are transferred from this unit to the Hazardous Waste Storage Area (SWMU CS-7) (Ref. 84).

Date of Start-up: Unknown.

Date of Closure: The unit is still active.

Wastes Managed: The drums present in the storage area contained waste solvents and were marked "Flammable Liquid N.O.S" (Ref. 84).

Release Controls: The drums were covered with sealed lids and the lines discharging solvents into the drums were equipped with automatic shut-off devices. Two sides of the concrete pad were protected with a sheet metal barrier. There was no curbing or other controls to contain releases from the unit (Ref. 73, p. 3-58).

History of Releases: There were no releases noted in the file information or observed during the VSI.

Conclusions: Soil/Groundwater: The potential for release to soil and groundwater is low due to the filling controls on the drums. In the event that a drum were tipped in this area, there would be a high potential for release since there are no secondary containment devices at this unit.

Surface Water: The potential for release to surface water is low due to the filling controls on the drums. In the event that a drum were tipped in this area, the potential for release

to surface water is moderate since there are no secondary containment structures at the unit.

Air:

The drums in this unit are sealed shut and, therefore, the potential for releases to the air is low.

Subsurface Gas:

There is no potential for generation of subsurface gas from this above-ground unit.

*1.14.1991* 126  
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ENVIRONMENTAL RESTORATION PROGRAM

SOIL GAS SURVEY AND GEOPHYSICAL INVESTIGATIONS  
MAIN HILL AND SM/PP HILL AREAS  
RECONNAISSANCE SAMPLING

MOUND PLANT  
MIAMISBURG, OHIO

February 1993

DEPARTMENT OF ENERGY  
ALBUQUERQUE OFFICE

ENVIRONMENTAL RESTORATION PROGRAM  
EG&G MOUND APPLIED TECHNOLOGIES

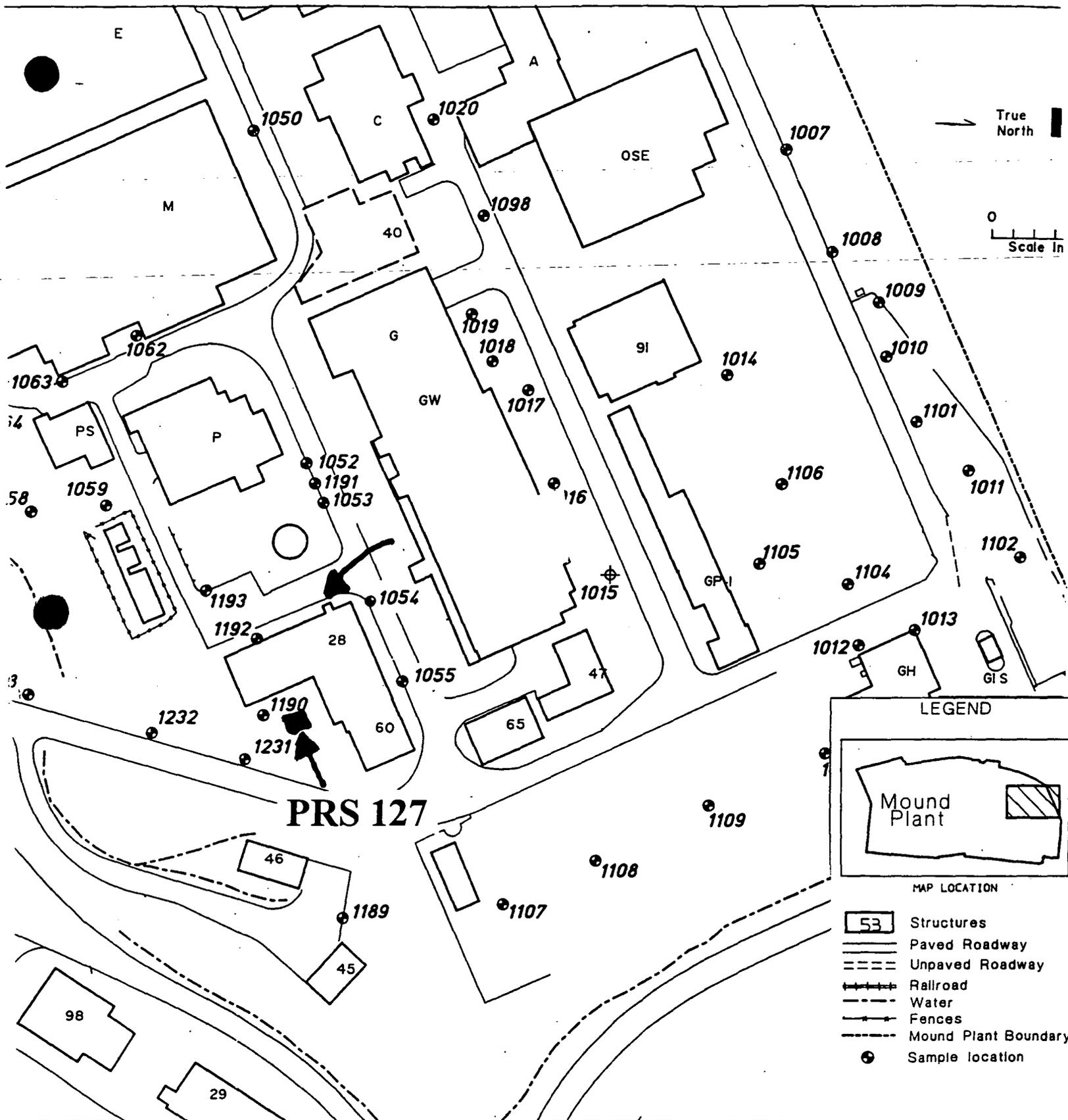


Figure 2.2. Main Hill east sample location map.

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
								---	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-01-1108-0003	16 AUG 92	---	329	---	---	---	---	6	---
MND-01-1108-0005	16 AUG 92	---	---	---	---	---	---	6	---
MND-01-1109-0005	16 AUG 92	---	---	---	---	---	---	8	13
MND-01-1110-0005	16 AUG 92	---	---	---	---	---	---	---	255

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
		---	9	---	---	315	10	11	---
		---	---	---	---	259	9	357	5*
		---	---	---	---	56	---	263	3*
		---	---	---	---	---	12	13	---
		---	---	---	---	---	15	8	---
		---	---	---	---	---	3	9	---
		---	---	---	---	---	---	---	---
		---	---	---	---	---	---	---	213
		---	---	---	---	---	---	---	---
		---	---	---	---	---	---	---	5*
		---	---	---	---	---	---	---	8884*
		---	---	---	---	---	4	---	27*
		---	10	---	---	37	12	4	11*
		---	---	---	---	---	---	---	3*
		---	---	---	---	---	---	---	3*
		---	---	---	---	---	---	---	5*
		---	---	---	---	---	---	---	16*
		---	---	---	---	---	---	4	64
		---	---	---	---	---	---	23	5
		---	24	13	518	33	---	474	5
		---	10218	---	120	---	---	479	---
		---	4716	13	811	---	---	130	48
		---	5895	---	612	---	---	117	43
		---	6419	66	2499	9	---	1921	3
		---	9301	41	1706	---	---	1737	---
		---	1475	---	334	---	---	45	192
		---	453	---	---	---	---	11	5
		---	---	---	---	---	---	---	21
		---	---	---	---	---	---	---	23142
		---	---	---	---	---	---	---	90
		---	10	---	---	---	---	---	4788
		---	---	---	---	---	---	---	11
		---	---	---	---	---	---	---	13
		---	---	---	---	---	---	---	5
		---	48	---	---	---	34	21	5
		---	4	---	---	---	13	8	24
		---	29	---	---	---	---	---	72
		---	29	---	---	---	---	---	64

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

**ENVIRONMENTAL RESTORATION PROGRAM**

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

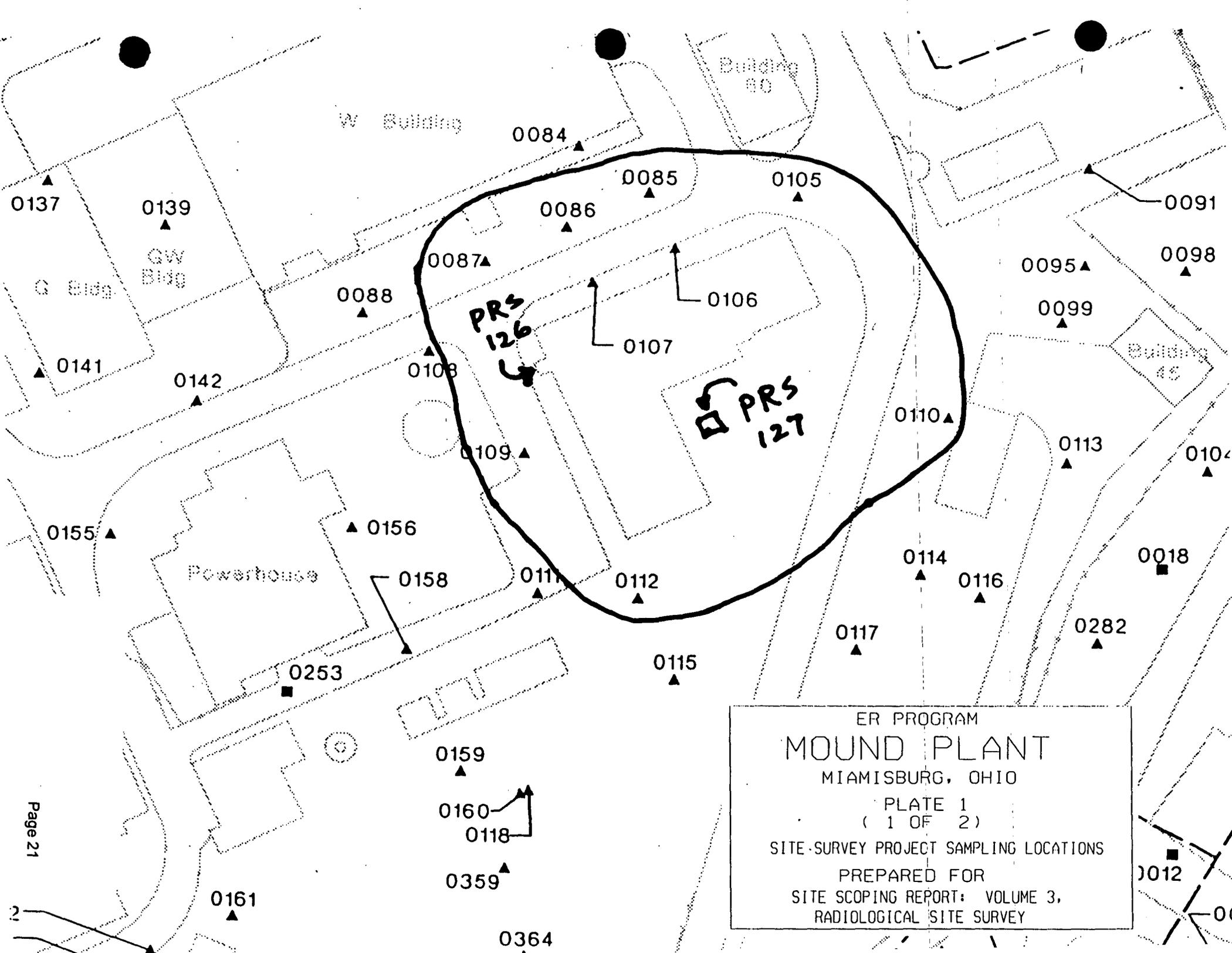
**MOUND PLANT  
MIAMISBURG, OHIO**

**June 1993**

**DEPARTMENT OF ENERGY  
ALBUQUERQUE FIELD OFFICE**

**ENVIRONMENTAL RESTORATION PROGRAM  
EG&G MOUND APPLIED TECHNOLOGIES**

**FINAL**



ER PROGRAM  
**MOUND PLANT**  
 MIAMISBURG, OHIO  
 PLATE 1  
 ( 1 OF 2 )  
 SITE SURVEY PROJECT SAMPLING LOCATIONS  
 PREPARED FOR  
 SITE SCOPING REPORT: VOLUME 3,  
 RADIOLOGICAL SITE SURVEY

Map Location <sup>a</sup>	Coordinates		MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium <sup>b</sup> (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
	South	West										
→ S0085	1490	2415	3041	10-83	0	0.11	b					
→ S0086	1490	2465	3042	10-83	0	0.13	b					
→ S0087	1490	2515	6137	08-84	0	0.31	b					
S0088	1490	2590	6138	08-84	0	0.63	b					
C0249	1500	1860	8348	11-84	54	0.01	2.25					
S0090	1525	1970	6451	08-84	0	0.32	b					
S0091	1575	2185	4087	10-83	0	1.23 <sup>c</sup>	b					
S0092	1585	2085	4086	10-83	0	0.78	b	1.05				
S0093	1600	1935	6452	08-84	0	0.53	b					
S0094	1625	1885	6453	08-84	0	1.04	b					
S0095	1625	2210	7103	09-84	0	0.04	b					
S0096	1650	1960	4085	10-83	0	0.36	b	0.55				
S0097	1650	2060	7107	09-84	0	0.51	b					
S0098	1650	2160	7104	09-84	0	0.13	b					
S0099	1650	2235	7102	09-84	0	0.07	b					
S0100	1685	2045	4083	10-83	0	0.73	b	0.37				
S0101	1735	2160	7105	09-84	0	0.15	b					
S0102	1750	2010	7106	09-84	0	0.56	b					
S0103	1750	2110	7108	09-84	0	0.56	b					

Map Location <sup>a</sup>	Coordinates		MRC ID No.	Mo-Yr	Depth (Inch)	Pu-238 (pCi/g)	Thorium <sup>b</sup> (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
	South	West										
S0104	1760	2195	4082	10-83	0	0.18	b	0.38				
→ S0105	1525	2340	3058	10-83	0	0.01	b	0.90				
→ S0106	1525	2415	6202	08-84	0	0.08	b					
→ S0107	1525	2465	6201	08-84	0	0.52	b					
S0108	1525	2565	3081	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 <sup>c</sup>	b					
S0114	1750	2365	6204	08-84	0	0.07	b					
S0115	1750	2515	6199	08-84	0	0.41 <sup>c</sup>	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 <sup>c</sup>	b					

Map Location <sup>a</sup>	Coordinates		MRC ID No.	Mo-Yr	Depth (inch)	Pu-238 (pCi/g)	Thorium <sup>b</sup> (pCi/g)	Tritium (pCi/mL)	Co-60 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Am-241 (pCi/g)
	South	West										
C0289	2422.7	2081.0	None <sup>d</sup>	07-84	0	NR	0.8					
			None <sup>d</sup>	07-84	12	NR	1.1					
			None <sup>d</sup>	07-84	24	NR	0.5					
			None <sup>d</sup>	07-84	36	NR	0.8					
			None <sup>d</sup>	07-84	48	NR	1.0					
			None <sup>d</sup>	07-84	60	NR	0.8					
C0290	2401.5	2102.1	None <sup>d</sup>	07-84	0	NR	0.7					
			None <sup>d</sup>	07-84	12	NR	0.8					
			None <sup>d</sup>	07-84	24	NR	0.8					
			None <sup>d</sup>	07-84	36	NR	0.8					
			None <sup>d</sup>	07-84	48	NR	0.6					
			None <sup>d</sup>	07-84	60	NR	0.9					
C0291	2915.3	2490.3	None <sup>d</sup>	07-84	0	NR	0.8					
			None <sup>d</sup>	07-84	12	NR	0.4					
			None <sup>d</sup>	07-84	24	NR	0.5					
			None <sup>d</sup>	07-84	36	NR	0.4					
			None <sup>d</sup>	07-84	48	NR	0.4					
			None <sup>d</sup>	07-84	60	NR	0.3					
			None <sup>d</sup>	07-84	72	NR	0.5					
			None <sup>d</sup>	07-84	84	NR	0.4					
			None <sup>d</sup>	07-84	96	NR	0.7					
			None <sup>d</sup>	07-84	108	NR	0.5					
			None <sup>d</sup>	07-84	120	NR	0.3					
			None <sup>d</sup>	07-84	132	NR	0.3					
S1692	2185	3362	0419	12-84	1	0.91	323.5 <sup>e</sup>					

<sup>a</sup>C denotes core location and S denotes surface sample location on Plate 1.

<sup>b</sup>Thorium results of  $\leq 2$  pCi/g are listed as "b".

<sup>c</sup>Verification sample analyzed for QA/QC.

<sup>d</sup>No MRC ID assigned because *in situ* gamma spectrometry was performed for thorium-232.

<sup>e</sup>Gamma results could not be confirmed using the gamma spectroscopy printout given in this appendix.

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

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

**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:

$$C_t = (C_g/P_b) * [(P_b * K_d / H) + [p_w / H] + [p_t - p_w]]$$

where

C <sub>g</sub>	concentration of volatile chemical concentrations as soil vapor in ng/ml
P <sub>b</sub>	Bulk density of the soil in g/ml
K <sub>d</sub>	soil/water partition coefficient in ml/g
H	Dimensionless Henry's Law Constant
p <sub>w</sub>	water filled porosity
p <sub>t</sub>	total porosity
C <sub>t</sub>	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<sup>-6</sup> 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:

$$C_g = (P_b * C_t) / [(P_b * K_d / H) + [p_w / H] + [p_t - p_w]]$$

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

P <sub>b</sub>	1.6	Bulk density of the soil in g/ml
p <sub>w</sub>	0.15	water filled porosity
p <sub>t</sub>	0.43	total porosity
f <sub>oc</sub>	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	414000
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.