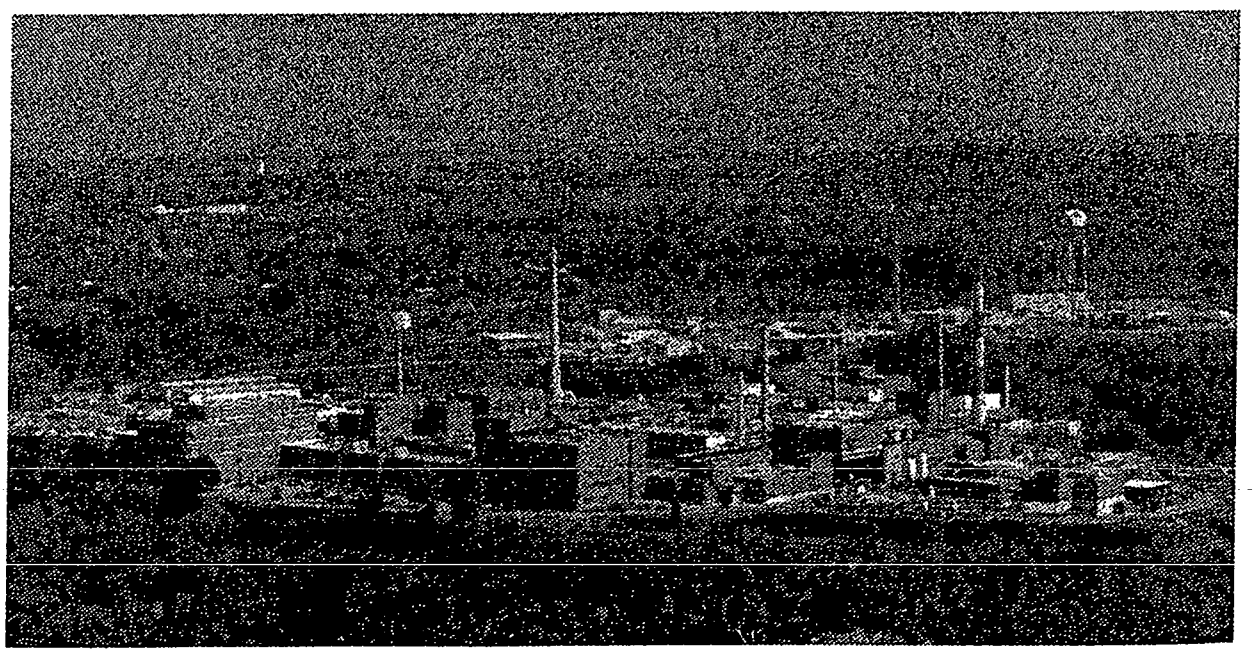
MOUND

Environmental
Restoration
Program

OhioEPA

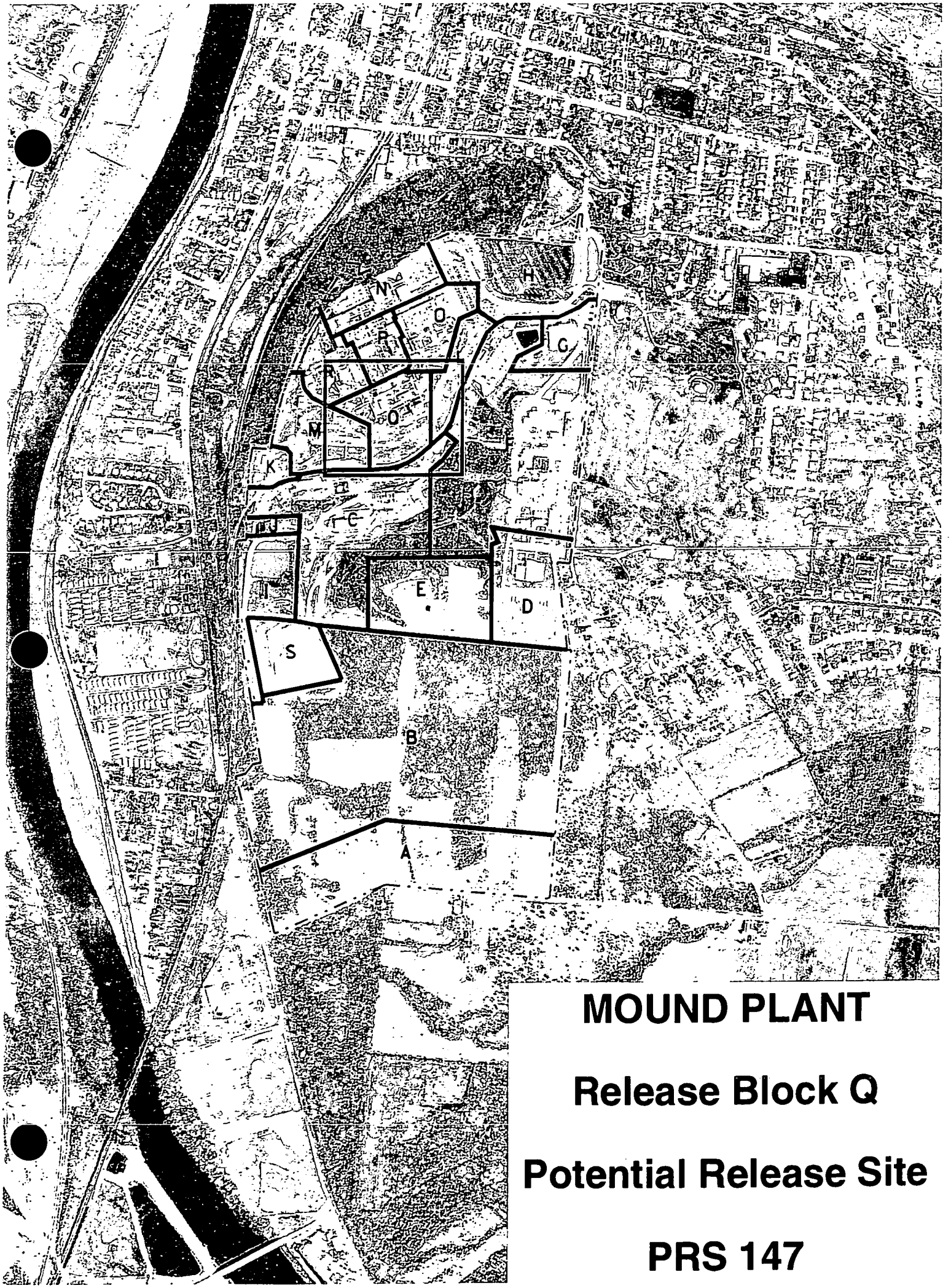
MOUND PLANT
Potential Release Site Package
PRS # 147



EG&G MOUND-30-03-04-02--9611130095

PRS 147

REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comments.	Mar. 14, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Oct. 10, 1996

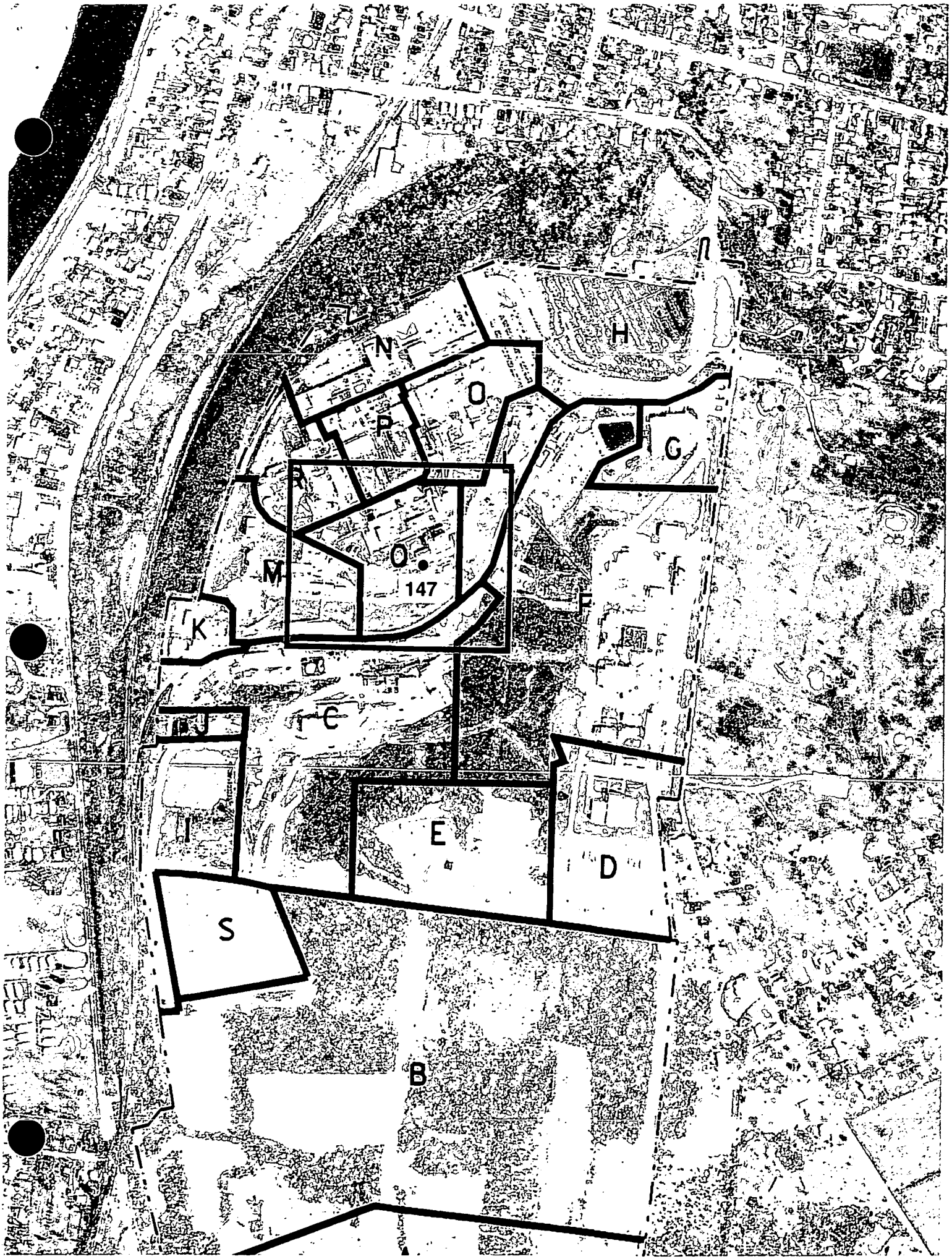


MOUND PLANT

Release Block Q

Potential Release Site

PRS 147


N
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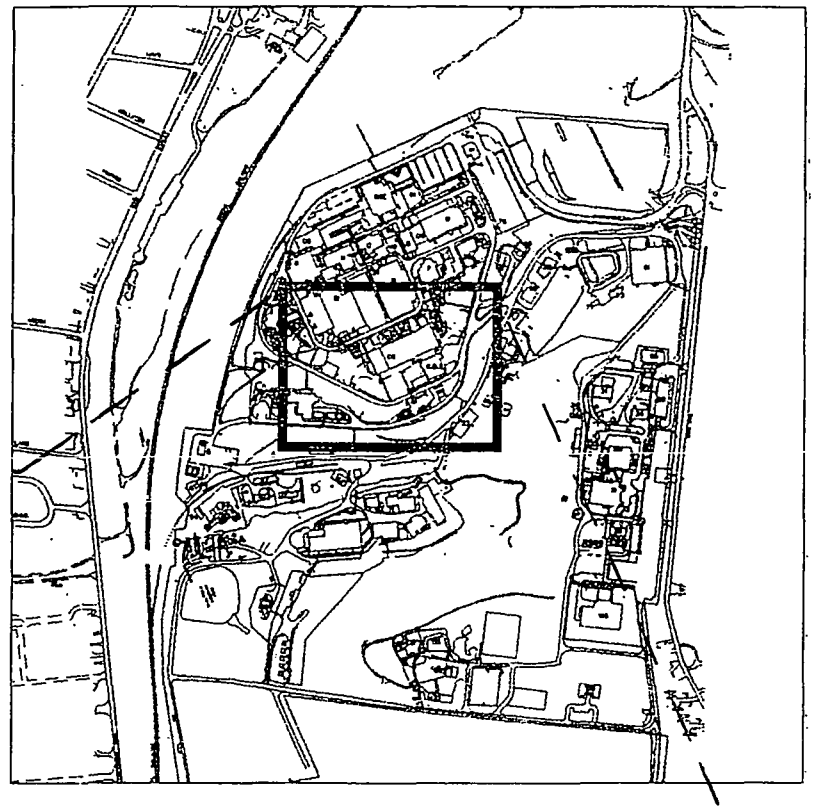
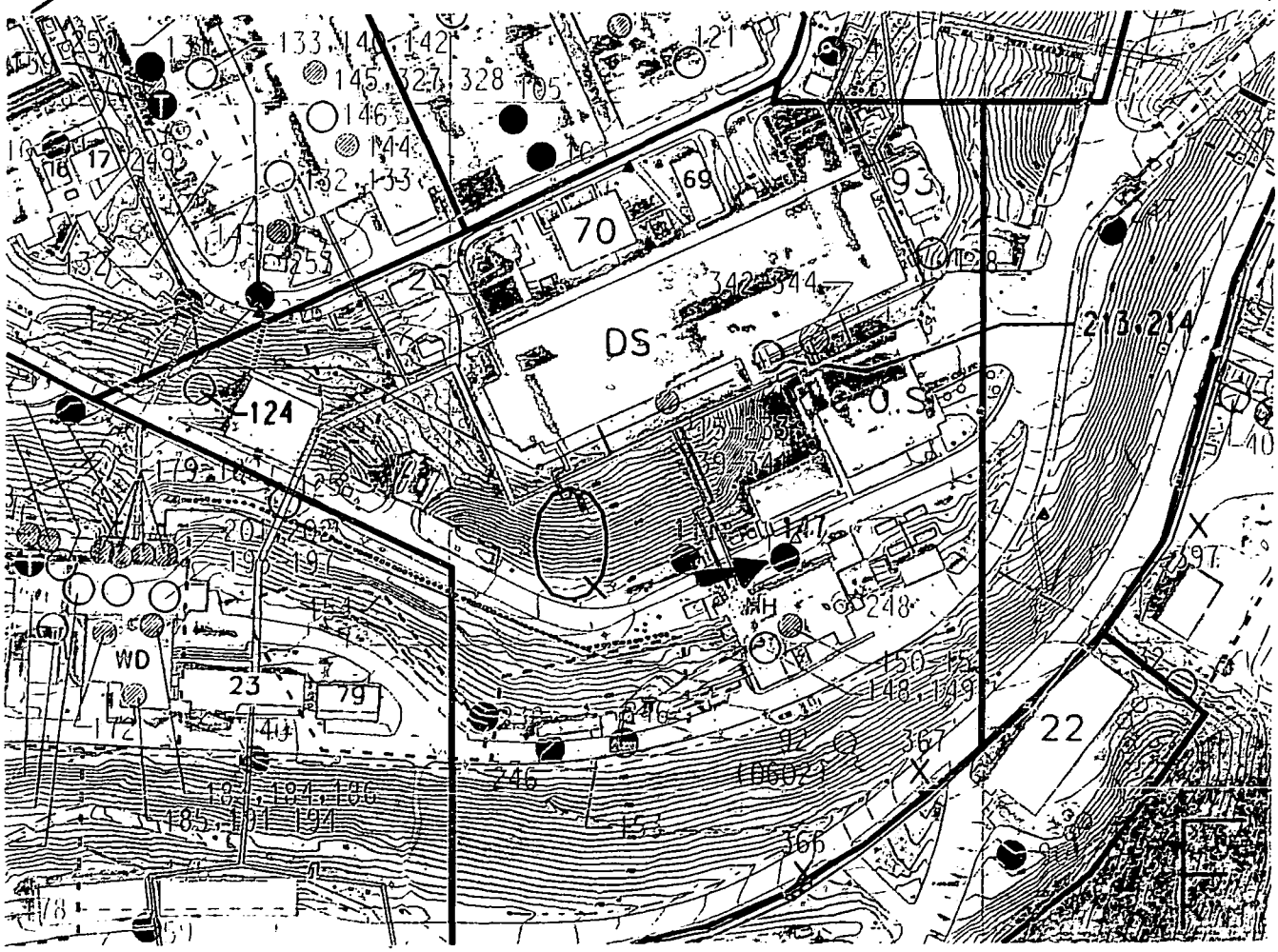
MOUND PLANT

Release Block Q

Potential Release Site

PRS 147





FULL
HH
HH
HH-3
EMPTY
147

PRS 147

PRS HISTORY:

The Hydrolysis House (HH) Building soils were identified as a potential release site as a result of the Soil Gas Survey and Geophysical Investigations - Reconnaissance Sampling Report, dated February 1993.[2] The area includes the paved area north of the HH Building dock and south of the roadway.

The areas associated with this potential release site have been used as an entrance to the HH Building dock. The potential release site area was utilized for shipping and receiving for HH Building operations. The history of HH Building operations is defined in Operable Unit 9 (OU9), Site Scoping Report, Vol. 7, Waste Management.[4]

CONTAMINATION:

The Soil Gas Survey indicated that the area described above contained elevated levels of VOCs in the soil beneath the pavement. The contaminant of concern is Toluene at levels ranging from 5 to 23,142 ppb. The calculated soil gas comparison value, based on an acceptable soil screening level, is 414,600 ppb.[6] Seep 602 which is downgradient of this potential release site indicates no detection of toluene.[5]

There is no evidence of data concerning potential radiological contamination at actual PRS location.[3]

READING ROOM REFERENCES:

1) OU9, Site Scoping Report, Volume 12, Site Summary Report Final, December 1994. (pages 5-9)
2) Soil Gas Survey & Geophysical Investigations, Main Hill and Special Metalurgy/Plutonium Processing Hill, Reconnaissance Sampling, Feb. 1993. (pages 10-12)
3) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, Final, June 1993. (pages 13-14)
4) OU9, Site Scoping Report: Volume 7 - Waste Management, Final, February 1993. (pages 15-17)
5) OU9, Regional Soils Investigation Report, Revision 2, August 1995. (pages 18-19)

OTHER REFERENCES:

6) Comparison of Actual Soil Gas Values with Calculated Acceptable Soil Gas Values. (pages 20-22)

PREPARED BY:

Richard Bauer, Member of EG&G Technical Staff

MOUND PLANT
PRS 147
SOIL CONTAMINATION - HH BUILDING

RECOMMENDATION:

Potential Release Site (PRS) 147 was initially identified as a result of the Soil Gas Survey which detected toluene levels ranging from 5 to 23,142 parts per billion (ppb). Of the four (4) samples collected in the area of PRS 147, none were above the calculated soil gas guideline value for toluene of 414,600 ppb. This means that the level of toluene contamination present in soil at PRS 147 cannot adversely affect the quality of groundwater at a potential drinking water source through leaching. No detection of toluene was indicated in the downgradient seep #602, which is approximately 250 feet from PRS 147. Therefore, PRS 147 requires NO FURTHER ASSESSMENT.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 3/12/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 3/11/96 (date)

OEPA: Brian K. Nickel, Project Manager — 3/14/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 4/15/96 to 5/15/96.

☒ No comments were received during the comment period.

☐ Comment responses can be found on page_____ of this package.

REFERENCE MATERIAL
PRS 147

Document Control No. _____

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[a]	Results	Ref
147	HH Building Soils	F-7	Grounds	Polonium-210, cobalt-60, tritium	4, 18	Indicated by Soil Gas Survey	S	12	1	SGS[b] Table B.4 Locations 1114, 1119, 1206, 1207, 1230	12
148	HH Building Solidification Unit	F-7	Historical	Cobalt-60, Polonium-210	4	Unknown			No Data		
149	HH Building Pilot Incinerator	F-7	Historical	Polonium-210	4	Probable air releases in 1951	A		No Data		
150	Room HH-15 Beta Wastewater Sump (Tank 236)	F-7	Inactive	Beta wastewater from restrooms and process area floor drains - tritium	3	Unknown			No Data		
151	Room HH-6 Alpha Wastewater Sump (Tank 237)	F-7	Historical	Alpha wastewater from process area floor drains. Possible contaminants include polonium-210, cobalt-60, and bismuth.	3, 4	Unknown - filled with concrete			No Data		
152	HH Building Beta Wastewater Sump (Tank 24)	F-7	In service	Beta wastewater from process area sinks and floor drains	3, 4	Unknown			No Data		
153	Area 20, Radioactive Waste Line Break	G-7	Grounds	Sodium nitrate, Plutonium-238, Cesium-137, Thorium, Cobalt-60	4, 5, 18	Cobalt-60	S	6, 18	1 2, 14, 16	SGS[b] Table B.4 Locations 1119 and 1120 Table B.1 (Table III.8 in Ref. 6)	12 6
154	Area 23, Thorium Contaminated Soil	F-6 G-6	Grounds	Thorium-230	18	Thorium-230	S	6	1 2	SGS[b] Table B.4 Location 1122 Table B.1 RSS[c] Location S1092 (Appendix E in Ref. 6)	12 6
155	Old Sanitary Disposal (SD) Plant (AKA Old Sanitary Wastewater Treatment Plant)	F-6	Surplus	Chromic acid, Calcium cyanide, Nickel sulfate, Nickel chloride, Black oxide, Copper cyanide	4, 5, 18	Unknown			No Data		
156	Old SD plant Tank (Tank 205)	F-6	Surplus	Polonium-210, Cobalt-60	3, 5						

TABLE A.2. ASSIGNMENT OF REGULATORY AUTHORITIES TO POTENTIAL RELEASE SITES AND RECOMMENDATIONS FOR FURTHER ACTION

				Operational Jurisdiction				Historic Activities			
No.	Site Name	Location	Status	Regulated Units	Regulatory Authority	Spill Response	SWMU	Evidence Of Release	Response Authority	Further Action Recommended	FFA OU
138	Room SW-137 Alpha Wastewater Sump (Tank 23)	E-6 F-6	Surplus		AEA	AEA		No	AEA	Yes	6
139	Room SW-10 Beta Wastewater Sump (Tank 226)	F-6	Inactive		AEA	AEA		No	AEA	D&D	
140	Beta Waste Solidification Facility - SW Building	E-6 F-6	In Service		AEA	AEA		No	NA	OM	
141	Tritium Effluent Removal System	E-6	In Service		AEA	AEA		No	NA	OM	
142	SW/R Building Solid Radioactive Waste Compactor	E-6 F-6	In Service		AEA	AEA		No	NA	OM	
143	R/SW/T Building Stack Diesel Fuel Storage Tank (Tank 117)	F-6	In Service		BUSTR	BUSTR		No	NA	OM	
144	R Building Sanitary Waste Collection Tank (Tank 120)	F-6	In Service	effluent to wastewater treatment	CWA	AEA		No	NA	OM	
145	Room R-128 Alpha Wastewater Tank (Tank 19)	E-6	In Service		AEA	AEA		No	NA	OM	
146	R Building Rooms 121, 144, 146 and 148	F-6	Historical		AEA	AEA		Yeo	AEA	D&D	
147	HH Building Soils	F-7	Grounds		AEA	AEA		Yes	CERCLA	Yes	2
148	HH Building Solidification Unit	F-7	Historical		NA	NA		No	AEA	No	
149	HH Building Pilot incinerator	F-7	Historical		NA			No	AEA	No	
150	Room HH-15 Beta Wastewater Sump (Tank 236)	F-7	Inactive		NA			No	AEA	D&D	
151	Room HH-6 Alpha Wastewater Sump (Tank 237)	F-7	Historical		NA				AEA	D&D	
152	HH Building Beta Wastewater Sump (Tank 24)	F-7	In Service		AEA	AEA			NA	OM	
153	Area 20, Radioactive Waste Line Break	G-7	Grounds		NA			Yes	AEA	Yes	6
154	Area 23, Thorium Contaminated Soil	F-6 G-6	Grounds		AEA	AEA		Yes	AEA	Yes	6
155	Old Sanitary Disposal (SD) Plant (AKA Old Sanitary Wastewater Treatment Plant)	F-6	Surplus		NA		SWMU	Yes	AEA	D&D	
156	Old SD plant Tank (Tank 205)	F-6	Surplus		NA		SWMU	Yes	AEA	Yes	6

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

SOIL GAS DATA (ABSOLUTE)

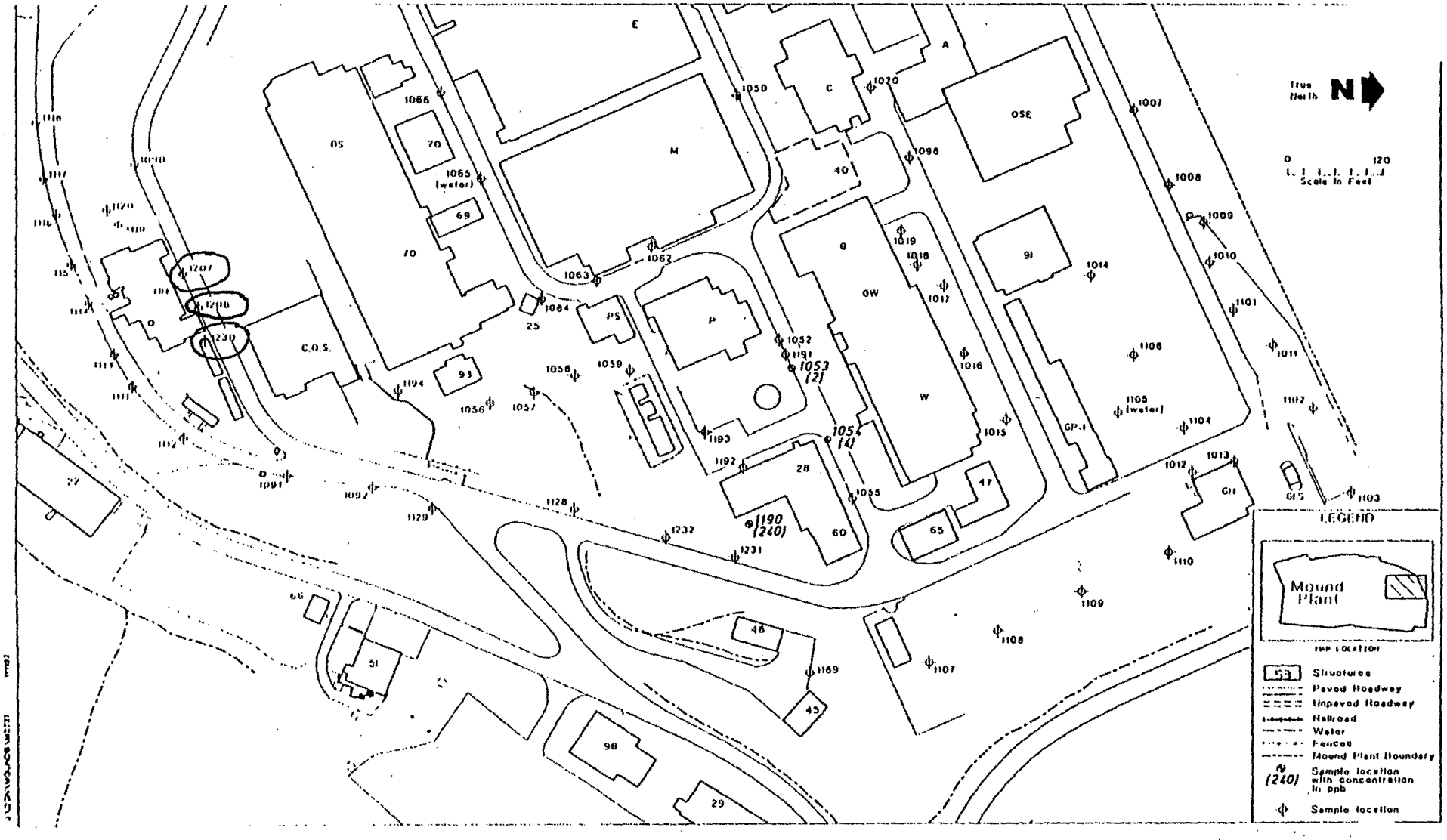


TABLE II.4. SUMMARY OF POSITIVE DETECTIONS - MAIN HILL
(ppb)

SAMPLE ID	SAMPLE DATE	FREON 11	FREON 113	TRAN-12DCE	CIS-12DCE	111TCA	PCE	TCE	TOLUENE
MND-01-1113-0005	17 AUG 92	---	---	---	---	---	---	11	---
MND-01-1114-0005	17 AUG 92	---	9	---	---	315	10	357	5 *
MND-01-1114-1005	17 AUG 92	---	---	---	---	259	9	263	3 *
MND-01-1115-0005	17 AUG 92	---	---	---	---	56	---	13	---
MND-01-1117-0005	18 AUG 92	---	---	---	---	---	12	8	---
MND-01-1117-1005	18 AUG 92	---	---	---	---	---	15	9	---
MND-01-1118-0005	18 AUG 92	---	---	---	---	---	3	---	---
MND-01-1119-0005	18 AUG 92	---	---	---	---	---	---	---	213
MND-01-1122-0005	18 AUG 92	801	13	---	---	---	---	---	---
MND-01-1123-0005	18 AUG 92	---	---	---	---	---	---	---	5 *
MND-01-1124-0005	18 AUG 92	---	---	---	---	---	---	---	6884 *
MND-01-1127-0005	18 AUG 92	---	---	---	---	---	4	---	27 *
MND-01-1129-0005	18 AUG 92	---	10	---	---	37	12	4	11 *
MND-01-1190-0005	24 SEP 92	240	477	---	---	---	---	---	3 *
MND-01-1190-1005	24 SEP 92	287	707	---	---	---	---	---	3 *
MND-01-1192-0005	24 SEP 92	---	---	---	---	---	---	---	5 *
MND-01-1193-0005	24 SEP 92	---	---	---	---	---	---	---	16 *
MND-01-1196-0005	25 SEP 92	---	---	---	---	---	---	4	64
MND-01-1197-0002	25 SEP 92	---	---	---	---	---	---	23	5
MND-01-1198-0006	25 SEP 92	---	24	13	518	33	---	474	5
MND-01-1199-0002	25 SEP 92	---	10218	---	120	---	---	479	---
MND-01-1201-0007	25 SEP 92	---	4716	13	811	---	---	130	48
MND-01-1201-1007	25 SEP 92	---	5895	---	812	---	---	117	43
MND-01-1202-0002	25 SEP 92	---	6419	66	2499	9	---	1921	3
MND-01-1202-1002	25 SEP 92	---	9301	41	1706	---	---	1737	---
MND-01-1203-0002	25 SEP 92	---	1475	---	334	---	---	45	192
MND-01-1204-0005	25 SEP 92	---	453	---	---	---	---	11	5
MND-01-1205-0005	25 SEP 92	---	---	---	---	---	---	---	21
MND-01-1206-0005	26 SEP 92	---	---	---	---	---	---	---	23142
MND-01-1207-0005	26 SEP 92	---	---	---	---	---	---	---	90
MND-01-1227-0005	28 SEP 92	---	10	---	---	---	---	---	4768
MND-01-1228-0005	28 SEP 92	---	---	---	---	---	---	---	11
MND-01-1230-0005	28 SEP 92	---	---	---	---	---	---	---	13
MND-01-1230-1005	28 SEP 92	---	---	---	---	---	---	---	5
MND-01-1231-0005	28 SEP 92	---	48	---	---	---	34	21	5
MND-01-1232-0005	28 SEP 92	---	4	---	---	---	13	8	24
MND-01-1233-0002	29 SEP 92	---	29	---	---	---	---	---	72
MND-01-1233-1002	29 SEP 92	---	29	---	---	---	---	---	64

SOIL GAS DATA
(ABSOLUTE)

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

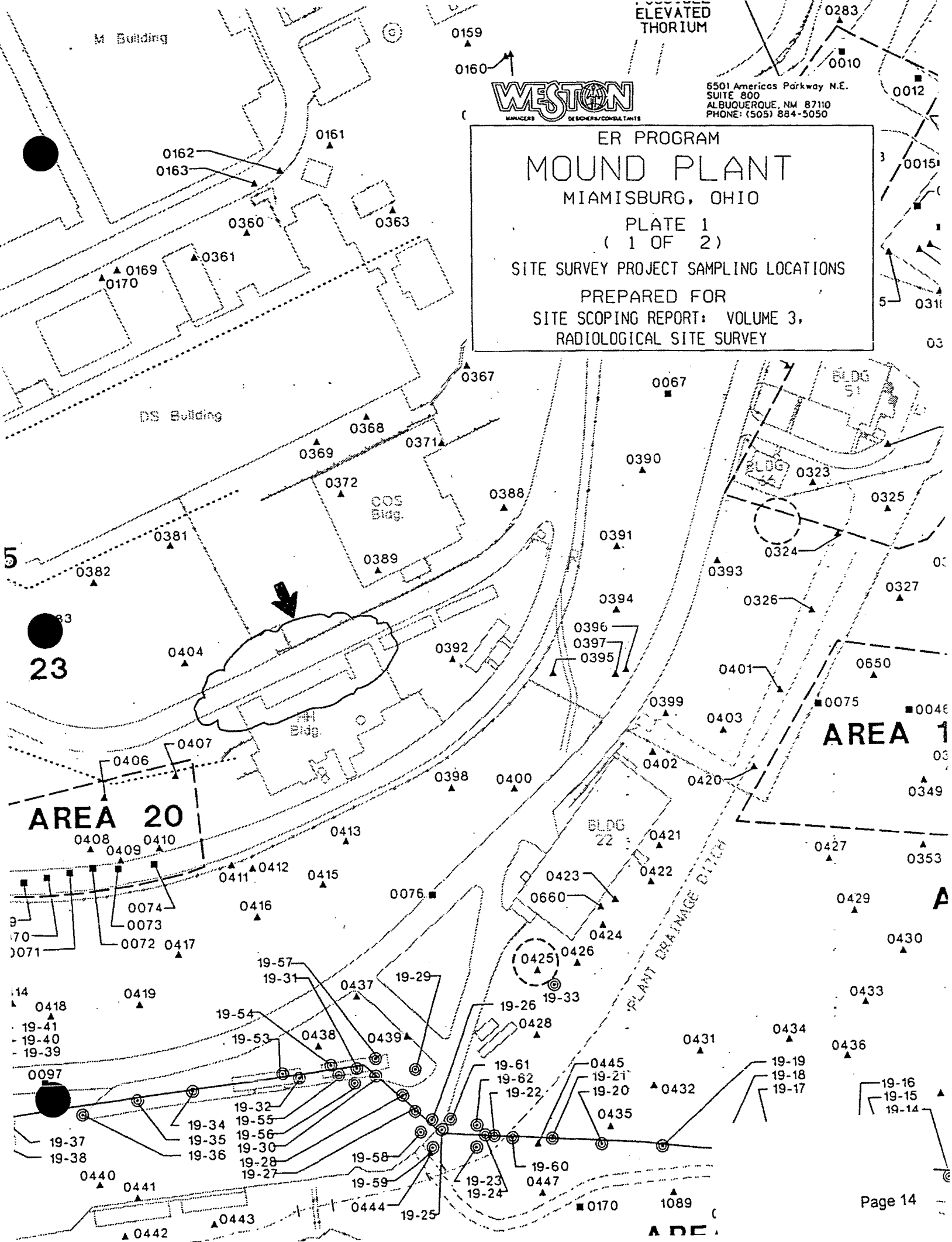
MOUND PLANT
MIAMISBURG, OHIO

June 1993

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL


ELEVATED THORIUM
WESTON
6501 Americas Parkway N.E.
SUITE 800
ALBUQUERQUE, NM 87110
PHONE: (505) 884-5050
ER PROGRAM
MOUND PLANT
MIAMISBURG, OHIO
PLATE 1
(1 OF 2)
SITE SURVEY PROJECT SAMPLING LOCATIONS
PREPARED FOR
SITE SCOPING REPORT: VOLUME 3,
RADIOLOGICAL SITE SURVEY
M Building
DS Building
OOS Bldg.
PH Bldg.
BLDG 51
BLDG 22
AREA 20
AREA 1
PLANT DRAINAGE DITCH

ENVIRONMENTAL RESTORATION PROGRAM

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

MOUND PLANT
MIAMISBURG, OHIO

February 1993

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

~~4.16. AREA 13, POLONIUM CONTAMINATED WOOD FROM DAYTON UNIT IV (HISTORICAL)~~

Area 13 is northeast of Building 49 in the Test Fire Area, in the south-central portion of Mound (Figure 4.1). In 1950, wood contaminated with polonium-210 from Dayton Unit IV was deposited in Area 13. Wood from the walls was not contaminated and was sold for salvage. The flooring, however, was too contaminated to remove from the plant. In July 1955, the wood flooring and other combustible materials were burned. Metal and other non-combustible materials were saturated with fuel oil and burned (Meyer 1955a, 1955d, 1956b). Residue was surveyed for radioactivity in August 1955. No alpha activity was detected, but some beta or gamma contamination was detected (Garner 1991). The residual material was moved and buried in the southern part of the Historic Landfill (Meyer 1955a,e). The 1982 to 1985 radiological site survey of Area 13 detected low levels of plutonium-238 in soils, but no thorium activity.

4.17. SOLID RADIOACTIVE WASTE COMPACTORS

Two solid radioactive waste compactors were located in Building 38 (Figure 4.1). The first compactor became operational in July 1974. Its purpose was to compact radioactive wastes containing less than 10 nCi/g of TRU radionuclides. The second compactor became operational in December 1974. This unit was used to compact solid wastes containing greater than 10 nCi/g of TRU radionuclides. The second compactor was enclosed in a specially designed room that allowed containment of any radioactivity released from the compaction process. The room was also designed with special features to allow simplified decontamination in the event of a radioactive release. The compacted waste was either shipped for off-plant burial or sent to INEL for 20-year retrievable storage (McClain 1975). These compactors were removed from service and dismantled in 1987 (Geichman 1991).

Compactors currently operating are in the T Building and the SW/R Building. Compatible LSA beta wastes are placed in plastic bags, inserted into 55-gallon drums, and reduced in volume through compaction. Another compactor is installed in the WD Building for the compaction of alpha wastes (MBC 1987).

4.18. HH BUILDING

The HH Building has served as a general purpose building over the life of the plant, having served originally as a waste treatment facility and more recently as a process facility. The building was constructed in 1948 to treat the concentrated solutions from the polonium operations. Design of the building, equipment, sumps, and piping was determined early during plant design and was based on experience in operating the Dayton units (Mead 1947). From 1949 to 1960, aqueous waste containing

bismuth chloride and aluminum chloride, generated by the polonium project in the T Building, was transferred to the HH Building for treatment. This transfer took place via four 2-inch Pyrex pipes that ran through a 6-ft concrete culvert that connected the two buildings. Caustic was added to the bismuth and aluminum decanning waste streams to bring the pH to approximately 12. The aluminum decan solutions produced a gelatinous hydroxide precipitate with many short-lived gamma-emitting isotopes produced during the irradiation. These precipitates were reportedly moved to the old explosives bunker for storage before shipment offsite. The bismuth waste stream precipitate was separated by filtration, and the filtrate was transferred to the 30,000-gallon influent tanks in the WD Building through a 3-inch iron pipe (Mead 1947). The bismuth sludge was drummed at the HH Building in 55-gallon drums and moved to the Quonset hut for storage.

The HH Building has also served to house many process operations including the incinerator pilot plant in 1951, bismuth recovery in 1951-1952, and perhaps the Purex pilot plant in 1953, the protactinium-231 separation activities in 1956, and stable isotope separations since the early 1960s.

In the early 1960s, the stable isotopic project was transferred to the HH Building. The raw gas facility and the processing of tritium to recover helium-3 are now housed in the HH Building. Prior to 1970, tritium gas produced by the helium-3 recovery process was vented to the atmosphere via the HH stack. After 1970, tritium gas was collected in tanks and transferred to the SW Building where the gas was processed in the tritium ERS. The use of gas cylinders was discontinued in the 1970s when a pipe was constructed between the HH and SW buildings and the waste tritium stream was piped to the ERS for tritium removal.

Tritiated wastewater is generated in the HH Building associated with tritium processing. This tritiated wastewater is transferred to the WD Building in 30-gallon drums, and the aqueous waste is transferred to 55-gallon drums and solidified for off-plant disposal.

~~4.19. WASTEWATER TREATMENT PLANT~~

~~The Wastewater Treatment Plant is southwest of the Main Hill, on the southwestern edge of the plant (Figure 4.1). The current activated sludge sanitary plant that serves the site has a capacity of 130,000 gallons per day. The treatment plant receives sanitary wastewater from restrooms, laboratory sinks, production and plant service areas, photographic processing areas, plating shops, and water softener backwashes. There are strict administrative controls to prevent anything but sanitary wastes from being discharged to the sanitary sewer system. Components of the facility include the grit chamber, comminutor, equalization basins, aeration basins, clarifiers, sand filters, chlorine contact chambers, and sludge press.~~

Environmental Restoration Program

OPERABLE UNIT 9
REGIONAL SOILS INVESTIGATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

August 1995

Revision 2

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

EG&G MOUND-29-01-10-07-02-950829000G1

APPENDIX E.3 MAIN HILL SEEPS SOIL INVESTIGATION (WATERS)

MAIN HILL SEEP 602			
		S21101	
		902-S21101	
		J0876.D REG	
		5/26/94	
		Result	Val
Volatile Organics	Units		
Acetone	UG/L	10	U
Acetonitrile	UG/L	100	U
Acrylonitrile	UG/L	100	U
Benzene	UG/L	5	UJ
Bromodichloromethane	UG/L	2	J
Bromoform	UG/L	2	J
Bromomethane	UG/L	10	UJ
2-Butanone	UG/L	10	U
Carbon Disulfide	UG/L	5	UJ
Carbon Tetrachloride	UG/L	5	UJ
Chlorobenzene	UG/L	5	UJ
Chlorodibromomethane	UG/L	3	J
Chloroethane	UG/L	10	U
Chloroform	UG/L	1	J
Chloromethane	UG/L	10	U
1,1-Dichloroethane	UG/L	5	UJ
1,2-Dichloroethane	UG/L	5	UJ
1,1-Dichloroethene	UG/L	1	J
1,2-Dichloroethene	UG/L	3	J
1,2-Dichloropropane	UG/L	5	UJ
cis-1,3-Dichloropropene	UG/L	5	UJ
trans-1,3-Dichloropropene	UG/L	5	UJ
1,2-Diethylbenzene	UG/L	5	UJ
Ethylbenzene	UG/L	5	UJ
Hexane	UG/L	10	U
2-Hexanone	UG/L	10	U
Iodomethane	UG/L	10	U
4-Methyl-2-pentanone	UG/L	10	U
Methylene Chloride	UG/L	10	U
Styrene	UG/L	5	UJ
1,1,2,2-Tetrachloroethane	UG/L	5	UJ
Tetrachloroethene	UG/L	5	UJ
Toluene	UG/L	5	UJ
1,1,1-Trichloroethane	UG/L	5	UJ
1,1,2-Trichloroethane	UG/L	5	UJ
Trichloroethene	UG/L	6	J
Trichlorotrifluoroethane	UG/L	5	UJ
Vinyl Acetate	UG/L	10	U
Vinyl Chloride	UG/L	10	U
Xylene, Total	UG/L	5	UJ

UJ The analyte has not been detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

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	Calculated Acceptable	Calculated Acceptable
			Soil Screening Level Value	Soil Gas Reading	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.

PRS 147

REV	DESCRIPTION	DATE
DRAFT		12/14/95
REGULATOR RELEASE A		(A) 1/18/96
REVISED 3/7/96 BJB PUBLIC RELEASE 0	ADDED: - OU9 Regional Soils (reference) - OU9 Volume 3 (reference) - Toluene guideline value. REVISED: - Back Calculated Soil Concentration. - Photograph to show dock area. - Contamination section. - Reference sections. **REVISED:** **- Recommendation.** **- Reference 6 and narrative in contamination field, pertaining to soil gas values.**	Q 2/19/96