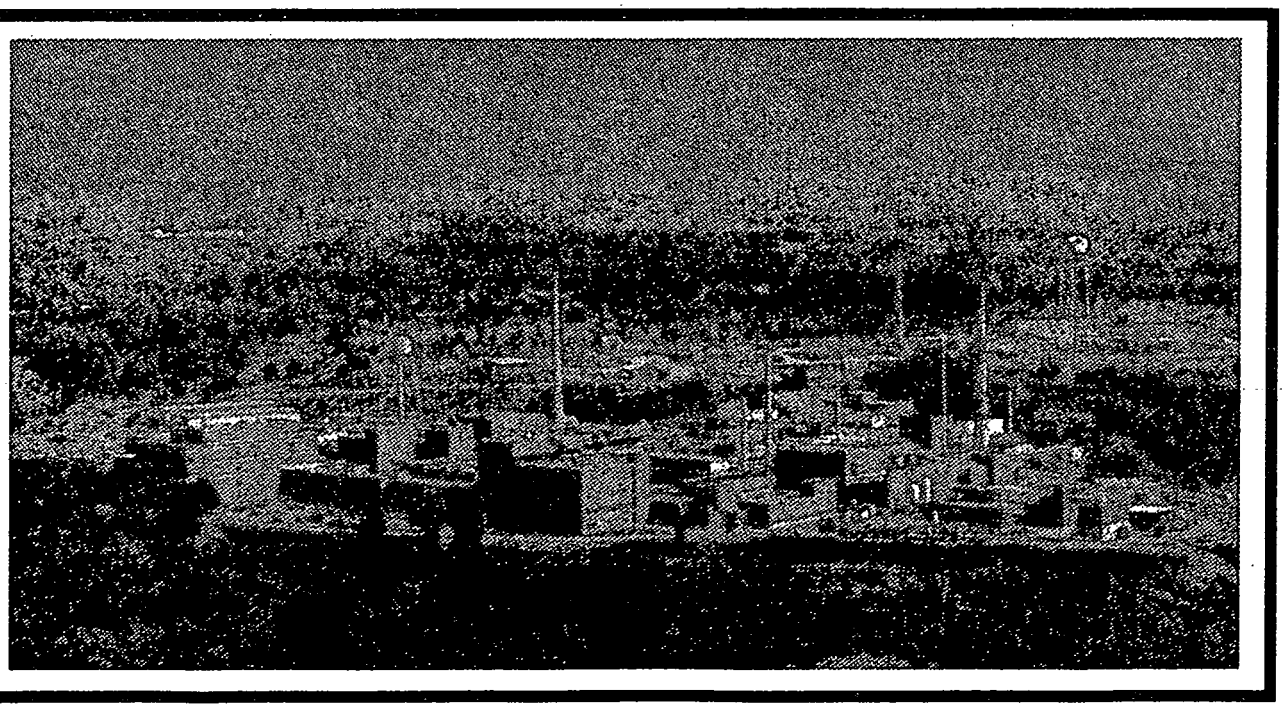
EG&G MOUND-30-03-04-02--9611260093

MOUND

Environmental
Restoration
Program

OhioEPA

MOUND PLANT
Potential Release Site Package
PRS # 245



PRS 245

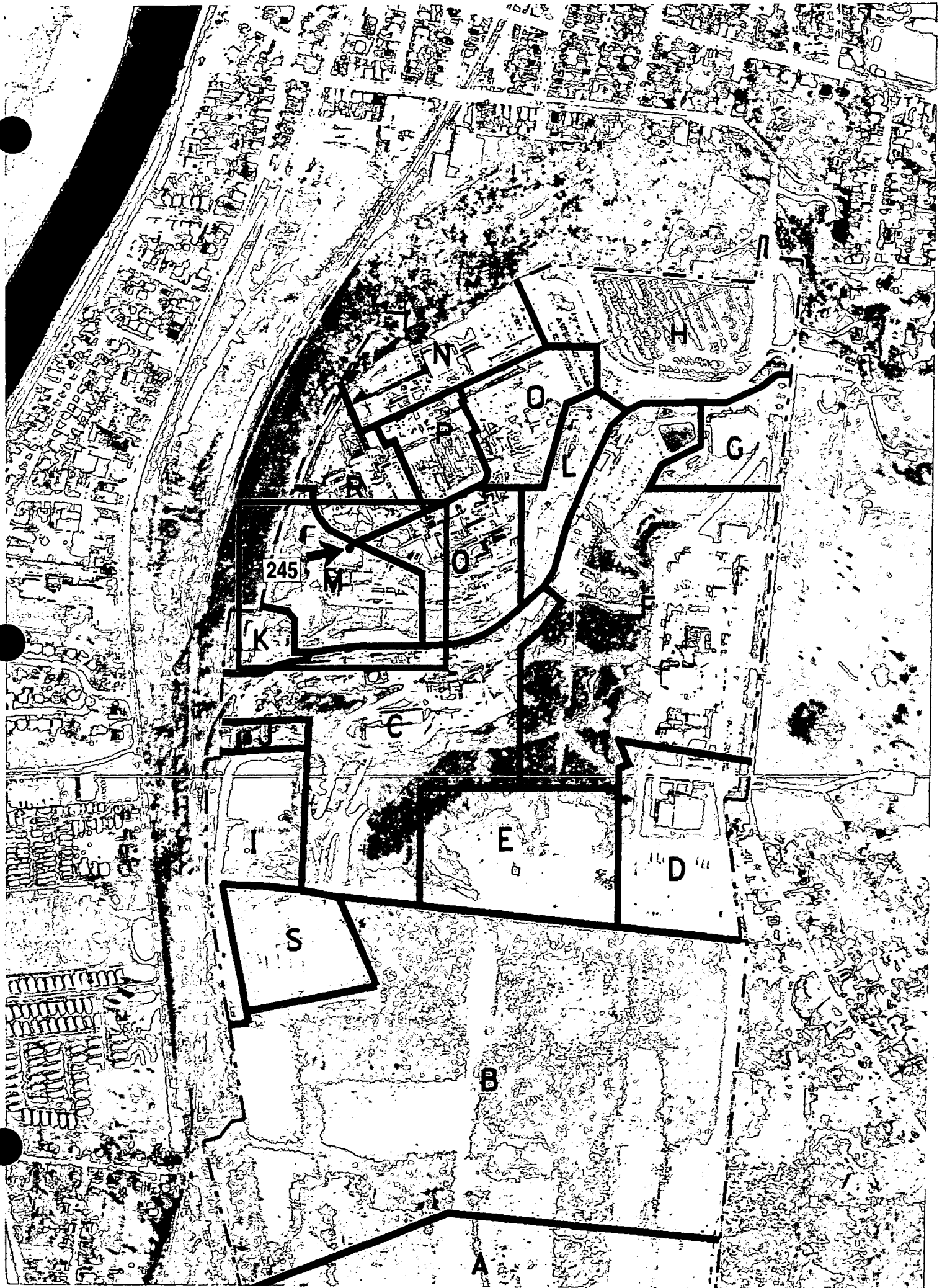
REV	DESCRIPTION	DATE
PUBLIC RELEASE **0**	Available for comments.	**Aug. 20, 1996**
FINAL **1**	Comment period expired. No comments. Recommendation page annotated.	**Oct. 16, 1996**
FINAL **2**	Signature page changed to show correct review period.	**Nov. 19, 1996**

MOUND PLANT

Release Block M

Potential Release Site

PRS 245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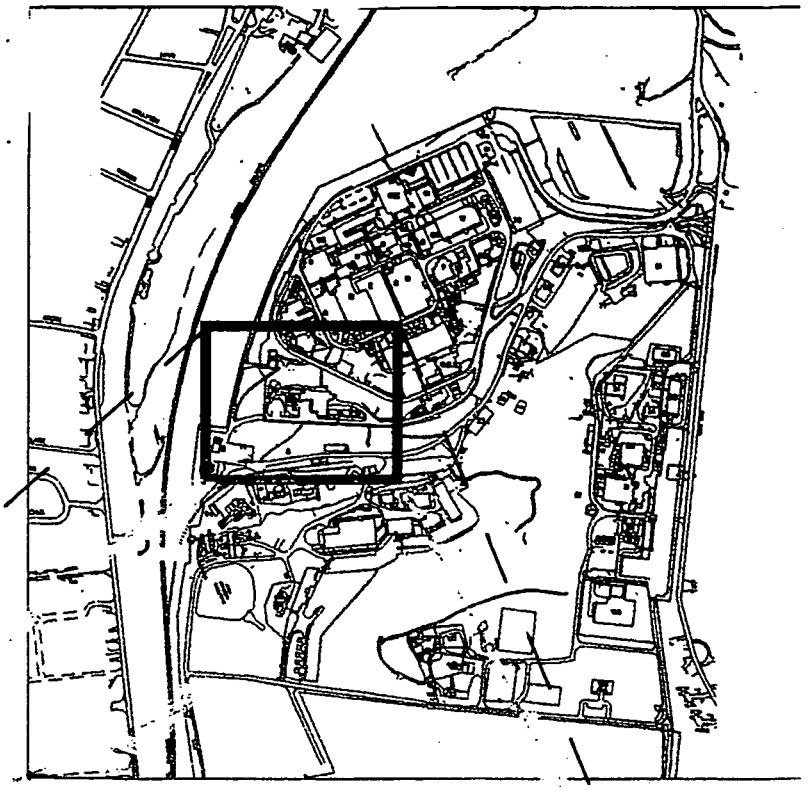
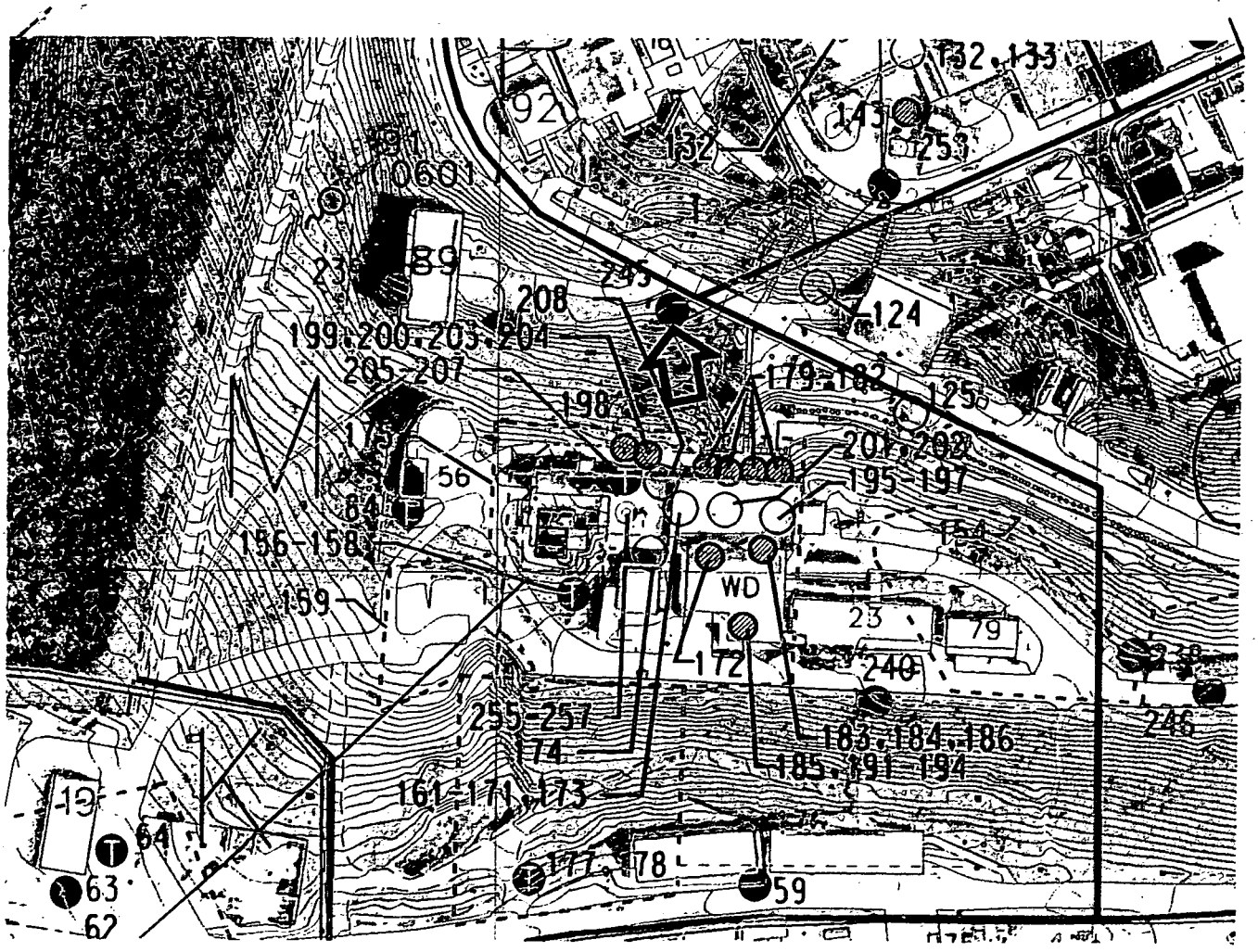
MOUND PLANT

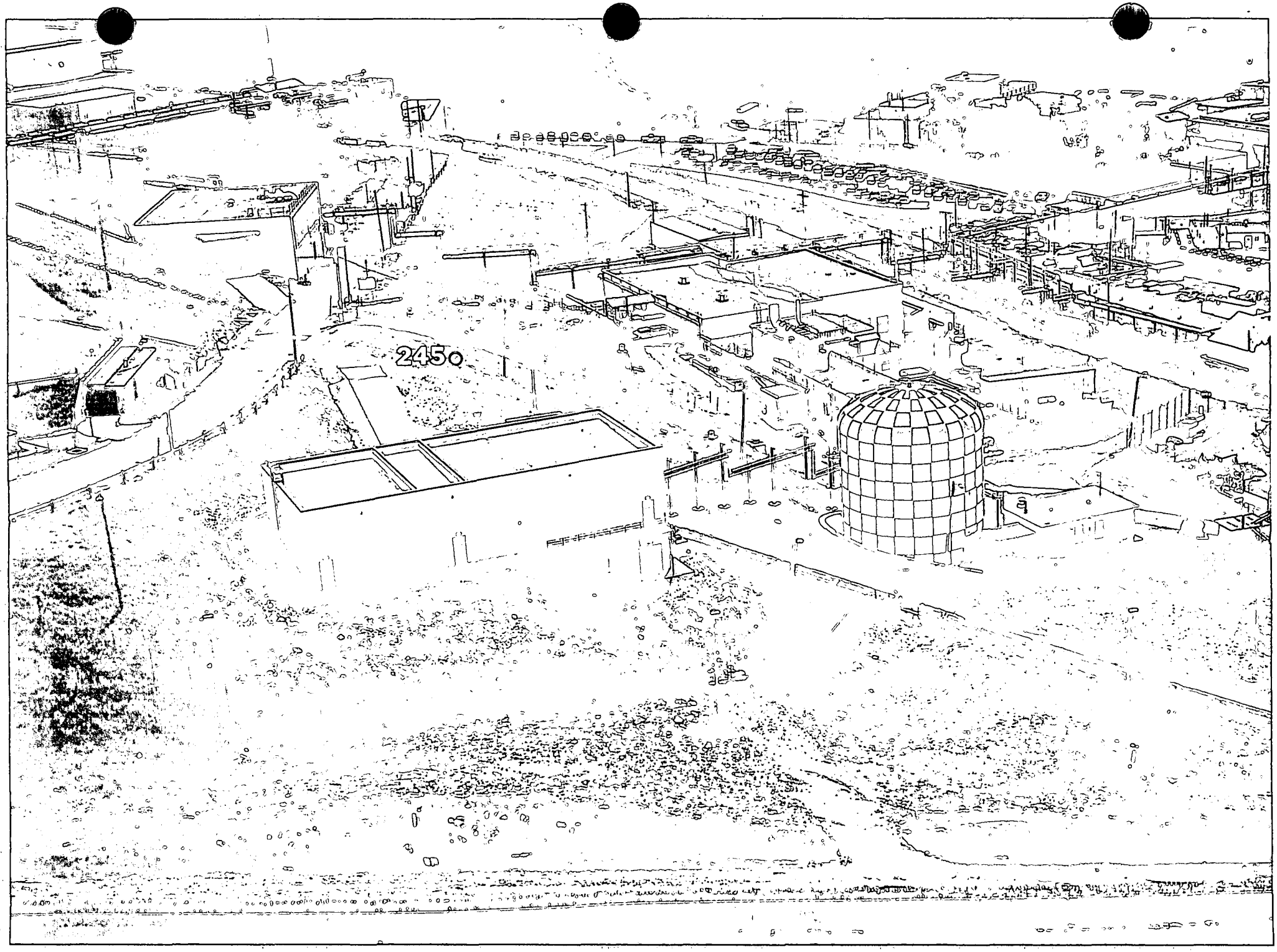
Release Block M

Potential Release Site

PRS 245



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PRS 245

PRS HISTORY:

PRS 245 is a soils location approximately 150 feet north of the Waste Disposal (WD) facility near the intersection of the Building 89 driveway and the road. This PRS was created due to the detection of volatile organic compounds (VOCs) during the Mound Reconnaissance Sampling Soil Gas Survey.[3]

Other than the WD facility, a treatment plant for radioactive wastewater, no other radioactive or hazardous processes or activities are known to have occurred in the vicinity of PRS 245.

CONTAMINATION:

I. Soil Gas Survey[3]

A) Investigation - The 1992 Reconnaissance Sampling Soil Gas Survey investigated VOCs via soil gas/gas chromatography.

- One soil gas sample was taken at PRS 245 (sample #1085).
- Five foot sample depth.

B) Results

Results for which Contaminant Concentrations can be Compared to Guideline Criteria:

Contaminant	Maximum Concentration Detected	Guideline Criteria (Calculated)[4]
1,1,1 Trichloroethane (111TCA)	22 ppb (soil gas)	173,400 ppb (soil gas)
Trichloroethylene (TCE)	41 ppb (soil gas)	2,400 ppb (soil gas)

NOTE: ppb = parts per billion

Other Results:

- Freon 11, 1,2-cis-Dichloroethene (1,2-cis-DCE), 1,2-trans-Dichloroethene (1,2-trans-DCE), and tetrachloroethene (PCE), and Toluene were all non detects.
- Maximum concentration of 1,1,2,-Trichloro-1,2,2,-trifluoroethane (Freon 113) was 0.102 ppm (soil gas).

II. Radiological Site Survey

A) Investigation - In 1983 through 1984, the Radiological Site Survey investigated radionuclides via Mound Soil Screening, radiochemistry, and gamma spectroscopy.

- There was one surface soil sample taken in the vicinity of PRS 245 (sample #S0200).
- Sample was analyzed for plutonium, thorium, and tritium.

B) Results

Contaminant	Maximum Concentration Detected	Guideline Criteria
Tritium	2,950 pCi/l (in soil moisture)	20,000 pCi/l (drinking water standard)[6]
Plutonium-238	1.05 pCi/g (in surface soil)	25 pCi/g (Mound ALARA in surface soil)
Thorium-232	Less than 2 pCi/g (in surface soil)	5 pCi/g (in surface soil)

NOTE: pCi = picocurries, g = grams, l = liters, ALARA = As low as reasonably achievable

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 6-8)
2) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey. (pages 9-14)
3) Reconnaissance Sampling Report Soil Gas Survey & Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill, February 1993. (pages 15-20)

OTHER REFERENCES:

4) Comparisons of Actual Soil Gas Values with Calculated Acceptable Soil Gas Values, Bray 3/5/96. (pages 21-23)
5) Code of Federal Regulations, 40 CFR 192.12 and 40 CFR 192.41.
6) Code of Federal Regulations, 40 CFR 141.16, National Primary Drinking Water Regulations.

PREPARED BY:

George Liebson, Member of EG&G Technical Staff

MOUND PLANT
PRS 245
SOIL CONTAMINATION - WD BUILDING

RECOMMENDATION:

This soils location was identified as a Potential Release Site (PRS) because of the detection of Volatile Organic Compounds (VOCs) during the Mound Reconnaissance Sampling soil gas survey. The compounds identified were trichloroethane (111-TCA), trichloroethene (TCE), and Freon 113.

Calculations were performed converting the 10^{-6} Risk Based Guideline Values (given in mg contaminant per kg soil) to corresponding 10^{-6} Risk Based Guideline Values for soil gas concentrations (parts contaminant per parts soil gas). The results of the calculation showed that the 111-TCA detection was approximately 8,000 times less than guideline criteria and the TCE detection was approximately 60 times less than guideline criteria (no guideline criteria exists for Freon 113). Additionally, plutonium-238 and thorium-232 concentrations were below their guideline criteria of 25 pCi/g and 5 pCi/g respectively.

Therefore, since the VOC soil gas detections establishing this soils location as a PRS have been shown not to be evidence of contamination above guideline criteria and since there is no additional evidence of contamination, PRS 245 requires NO FURTHER ASSESSMENT.

CONCURRENCE:

DOE/MB: _____ 8/20/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 8/20/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____ 8/20/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 9/18/96 9/16/96 to 10/15/96

☒ No comments were received during the comment period.

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

REFERENCE MATERIAL
PRS 245

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
241	Northwest Parking Lots	D-7	Grounds	Toluene, Freon-113, Trichloroethene	12	Indicated by Soil Gas Survey	S	12	1	SGS[b] Table B.4 Locations 1002, 1007, 1008, 1009, 1010, 1014, 1101, 1102, 1106, 1109, 1110	12
242	VOC Potential Hot Spot Location 1016	D-7	Grounds	Toluene, Trichloroethene	12				1	SGS[b] Table B.4	12
243	VOC Potential Hot Spot Location 1064	E-7	Grounds	Toluene	12						
244	VOC Potential Hot Spot Locations 1076, 1077, 1079, and 1080	E-6	Grounds	Toluene, Freon-113, 1,1,1-Trichloroethane	12						
245	VOC Potential Hot Spot Location 1085	F-6	Grounds	Freon-113, Trichloroethene, 1,1,1-Trichloroethane	12						
246	VOC Potential Hot Spot Locations 1117 and 1118	G-7	Grounds	Tetrachloroethene	12						
	Potential Hot Spot Location 1129	F-8	Grounds	Freon-113, Trichloroethene, 1,1,1-Trichloroethane, Tetrachloroethene	12	Indicated by soil gas survey	S	12	1	SGS[b] Table B.4	12
	IH Building Stack	F-7	In service	Polonium-210, Tritium	4, 18	None suspected beyond routine emissions	A	4, 18	Emissions reported in Annual Environmental Monitoring Reports		18
	uilding Stack (NCPDF)	E-6	In service	Tritium	4, 18						
	Building Stack (SW1C)	E-6	In service	Uranium-238	4, 18						
	Building Stack (HEPS)	E-6	In service	Tritium	4, 18						
	B Building Stack	E-6	Inactive	Polonium-210, Tritium	4, 18						
	ilding WEST Stack	E-6	In service	Tritium, Plutonium-238 -239, Uranium-238	4, 18						
	uilding EAST Stack	E-7	In service	Tritium, Plutonium-238, Uranium-238	4, 18						
	Building Stack (ALR)	F-6	In service	Plutonium-238	4, 18						

[a]Analyte List Codes
[b]SGS, Soil Gas Survey
[c]RSS, Radiological Site Survey

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
240	Site Survey Project Potential Hot Spot Location S0472	G-6	Grounds		AEA			Yes	AEA	Yes	6
241	Northwest Parking Lots	D-6 D-7	Grounds		AEA			Yes	CERCLA	Yes	2
242	VOC Potential Hot Spot Location 1016	D-7	Grounds		AEA			Yes	CERCLA	Yes	2
243	VOC Potential Hot Spot Location 1064	E-7	Grounds		AEA			Yes	CERCLA	Yes	2
244	VOC Potential Hot Spot Locations 1076, 1077, 1078 and 1080	E-6	Grounds		AEA			Yes	CERCLA	Yes	2
245	VOC Potential Hot Spot Location 1085	F-6	Grounds		AEA			Yes	CERCLA	Yes	2
246	VOC Potential Hot Spot Locations 1117 and 1118	G-7	Grounds		AEA			Yes	CERCLA	Yes	2
247	VOC Potential Hot Spot Location 1129	F-8	Grounds		AEA			Yes	CERCLA	Yes	2
248	HH Building Stack	F-7	In Service	NESHAP	CAA	AEA		No	NA	OM	
249	SW Building Stack (NCPDE)	F-6	In Service					No	NA	OM	
250	SW Building Stack (SWTC)	F-6	In Service	NESHAP	CAA	AEA		No	NA	OM	
251	SW Building Stack (HEFS)	F-6	In Service					No	NA	OM	
252	B Building Stack	E-6	Inactive		AEA	AEA		No	AEA	D&D	
253	T Building WEST Stack	F-7	In Service					No	NA	OM	
254	T Building EAST Stack	F-7	In Service					No	NA	OM	
255	WD Building Stack (ALR)	F-6	In Service	NESHAP	CAA	AEA		No	NA	OM	
	ilding Stack (AHR)	F-6	In Service					No	NA	OM	
	uilding Stack (SB)	F-6	In Service					No	NA	OM	
	H Open Burn Unit echnic Waste Disposal Area)	I-7	In Service				SWMU	No	NA	OM	
	chnic Waste Shed	I-7	In Service	HWMUs included in Part B application	RCRA	RCRA	SWMU	No	NA	OM	
	al Treatment Unit	I-7	Inactive				SWMU	No	NA	OM	
	Trash Burner	I-7	Historical		NA	NA	SWMU	No	CERCLA	No	5
	Retort	I-7	In Service	HWMU included in Part B application	RCRA	RCRA	SWMU	No	NA	OM	

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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

The drilling and sampling were performed using an auger drill rig and a 2-ft, split-barrel sampler. As the split-barrel sampler was removed from the borehole, it was monitored for radioactivity contamination by Mound Plant health physics personnel using a FIDLER to detect radioactivity contamination that would pose a hazard to the workers present. After the soil was removed from the sampler and placed in sample containers, field team members wearing gloves brushed the remaining soil out of the sampler. The gloves were then monitored with an alpha scintillometer before the split-barrel sampler was used again. However, no standard decontamination was performed.

The core locations are shown in Plate 1. The core locations were surveyed by a licensed surveyor after drilling was completed. The available reports submitted to Mound Plant by the drilling subcontractors are presented in Appendix B.

2.1.4. Sample Analyses

2.1.4.1. FIDLER Screening

In order to identify samples with concentrations of plutonium-238 exceeding 25 pCi/g and total thorium exceeding 2 pCi/g, all of the soil samples collected were pulverized and then screened using a Bicron® FIDLER at the Mound Plant Soil Screening Facility, known as trailer 15 at the time of the Site Survey Project. The Soil Screening Facility is now located in the H Building at Mound Plant (Plate 1). The minimum detectable activity at which plutonium-238 can be reliably detected at the Mound Plant screening facility is estimated to be 25 pCi/g (Draper 1986b). The detection of plutonium-238 at lesser concentrations (12-25 pCi/g) was unreliable and had an estimated error of ±75 percent. The estimated error decreased with increasing sample activity; for samples with 25 to 100 pCi/g of plutonium-238, the estimated error was ±35 percent, and for samples with >100 pCi/g, the estimated error was ±30 percent (Casella and Bishop 1984). The minimum detectable activity for thorium from FIDLER screening was estimated to be about 2 pCi/g (Stought et al. 1988). The Mound Plant procedure for screening soil samples is provided in Appendix A.

2.1.4.2. Radiochemical Analysis for Plutonium-238

Because of the high error (±75 percent) involved in the FIDLER screening of samples containing less than 25 pCi/g of plutonium-238, all soil samples were radiochemically analyzed by Mound Plant for plutonium-238. The lower detection limit (LDL) for plutonium-238 by this method was estimated to be 0.01 pCi/g, with a relative precision (two standard deviations) of 25 percent. The overall precision of the plutonium-238 measurements was reported to be about 18 percent (DOE 1991b). The Mound

Plant procedure for the radiochemical analysis of soil samples for plutonium-238 is provided in Appendix A.

2.1.4.3. Radiochemical Analysis for Thorium

Samples with thorium concentrations in excess of 2 pCi/g by FIDLER screening were also radiochemically analyzed for thorium, resulting in the radiochemical analysis of about 12 percent of the samples. The LDLs for the thorium isotopes using radiochemical procedures were estimated to be

- 0.3 pCi/g for thorium-228, with a relative precision of 60 percent;
- 0.3 pCi/g for thorium-230, with a relative precision of 30 percent; and
- 0.1 pCi/g for thorium-232, with a relative precision of 70 percent.

The overall precision for the thorium measurement was reported to be about 25 percent. The thorium results were reported in pCi of total thorium per gram of soil, isotopes were not identified. The Mound Plant procedure for the radiochemical analysis of soil samples for thorium is provided in Appendix A.

2.1.4.4. Gamma Spectroscopy

Gamma spectroscopy was performed by Mound Plant on approximately 350 (18 percent) of the soil samples in order to verify the identity of the radionuclides present when screening indicated the presence of gamma-emitting radionuclides, but little excess plutonium or thorium was identified by radiochemical analysis. Gamma spectroscopy is capable of detecting a variety of gamma-emitting radionuclides; the radionuclides detected in samples collected during the Site Survey Project included cobalt-60, cesium-137, radium-226, actinium-227, and americium-241. No other gamma-emitting radionuclides with gamma energies below 1.5 millielectron volts (MeV) were detected, although the project report stated that subsequent sampling and analysis in some areas indicated bismuth-207 and bismuth 210m. No polonium-210 peaks were detected in the Site Survey Project samples, confirming that polonium-210, which was used at Mound Plant in the 1950s, is no longer present due to radioactive decay (half-life of 138.4 days). The LDLs for cesium-137, cobalt-60, and americium-241 were given with the original data, and were estimated to be 0.5 pCi/g for each. The LDLs for radium-226 and actinium-227 were estimated to be 1.0 pCi/g for both (Stought 1990). The Mound Plant procedure for gamma spectroscopy is provided in Appendix A.

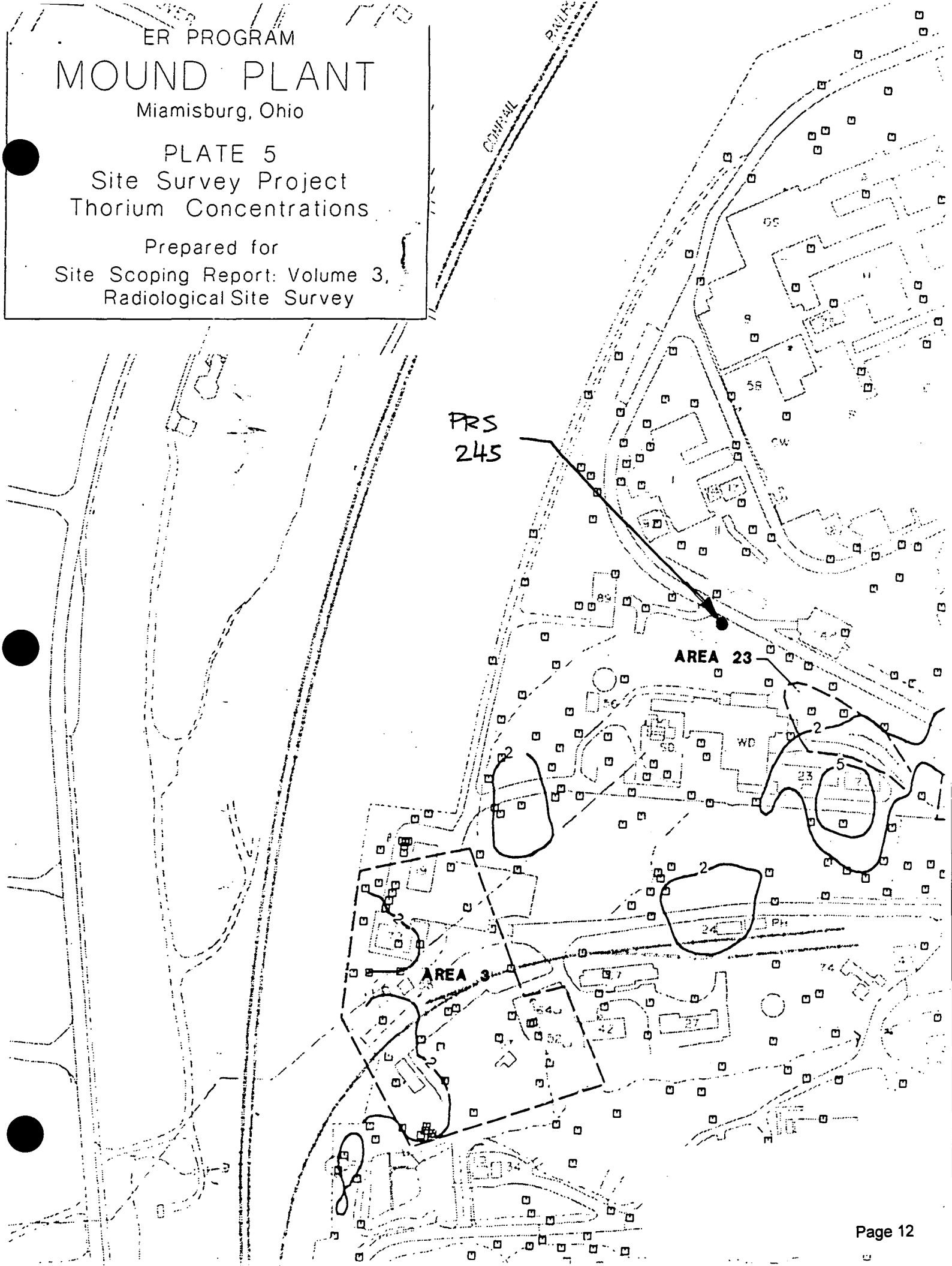
ER PROGRAM

MOUND PLANT

Miamisburg, Ohio

PLATE 5
Site Survey Project
Thorium Concentrations

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



ER PROGRAM

MOUND PLANT

Miamisburg, Ohio

PLATE 4

Site Survey Project

Plutonium Concentrations

Prepared for

Site Scoping Report: Volume 3,
Radiological Site Survey

Map Location[a]	Coordinates South	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)
S0199	1680	3480	6216	08-84	0	1.71	b					
S0200	1725	3555	4003	10-83	0	1.05[c]	b	2.95				
S0201	1625	3705	6219	08-84	0	2.21	b					
S0202	1675	3430	6218	08-84	0	1.15	b					
S0203	1700	3630	6221	08-84	0	2.61	b					
S0204	1700	3680	6220	08-84	0	2.03	b					
S0205	1505	3810	3089	10-83	0	0.54	b					
S0206	1575	3855	3087	10-83	0	1.87	b					
S0207	1650	3785	6278	08-84	0	0.75	b					
S0208	1660	3765	3085	10-83	0	61.00[c]	b	0.72				
S0209	1675	3765	9849	06-85	0	NR	NR		0.5	0.8	0.8	LDL
S0210	1675	3860	3088	10-83	0	0.84	b					
S0211	1675	3960	6280	08-84	0	0.39	b					
S0212	1725	3860	6277	08-84	0	1.17	b					
S0213	1750	3935	6279	08-84	0	1.79	b					

[a] Map locations are given using a "C" to designate core locations and an "S" to designate surface locations.

[b] A "b" indicates that the total thorium concentration was less than the background level of 2.0 pCi/g, using FIDLER screening. Therefore, radiochemical analysis was not performed.

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

LDL - The measured concentration was below the lower detection limit, estimated to be 0.5 pCi/g for cobalt-60, cesium-137, and americium-241; and 1 pCi/g for radium-226.

MRC ID - Monsanto Research Corporation Identification

pCi/g - picocuries per gram

pCi/mL - picocuries per milliliter

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

2. SOIL GAS SURVEY

2.1. SOIL GAS SAMPLING AND ANALYSIS PROCEDURE

All soil gas sampling was performed by driving 5-foot sections of drill rod and steel points into the subsurface and drawing soil vapor to a gas collection system mounted on a soil gas collection rig. As described in Appendix A of the February 1992 work plan, a vacuum pump draws soil vapors through the sampling apparatus at a flow rate of 100 ml/min. After at least three purge volumes have been vacuumed, a sample cartridge containing a 3-layer carbon sorption tube is attached and used to collect the soil gas sample.

During this investigation, most soil gas probes were installed using a truck-mounted hydraulic hammer. A few locations required manual hammering due to rig access difficulty; however, all sample collection activities were consistent and utilized the truck-mounted soil gas collection rig. Soil gas sampling depths varied according either to planned objectives or to probe penetration refusal which was frequently caused by shallow bedrock or the presence of buried rock/debris.

The five groundwater samples collected during this study were retrieved using 3/8-inch stainless steel bailers and nylon cord lowered down the inside of each probe. Each water sample was carefully poured into laboratory-prepared 40 ml VOA vials for subsequent analysis. Water samples were collected at sample locations 1065 and 1105 (Main Hill at 5 feet in depth), 2036 (Area 7 at 5 feet), and 4157 and 4160 (Building 51 at 25 feet).

All sampling equipment was decontaminated between locations using the procedures described in the work plan. Following the collection of each sample, the probes were pulled from the ground and the remaining hole backfilled with bentonite pellets.

All soil vapor and groundwater samples were analyzed in an on-site mobile laboratory for VOCs using U.S. EPA Method 8021. During the first 10-day field work shift the samples were analyzed for the six compounds described in the PAW. These included Freon 11, 1,2-dichloroethene (cis and trans), TCE, 111TCA, and toluene. Peaks on the gas chromatograph curves showed the presence of additional solvent-type VOCs. Consequently, the laboratory chemist added standards for Freon 113 and PCE, which were the most prevalent of the additional VOCs detected. Quality control samples were collected and analyzed throughout the field effort to monitor VOC interference, check data accuracy, and instrument calibrations, and evaluate purging efficiencies.

Prior to each day's soil gas sampling, field blanks of the entire sampling apparatus were taken and analyzed to check background contamination in the sampling system and cartridges. Duplicate soil gas or shallow groundwater samples were collected from each sampling location. Duplicate analyses were performed on at least 10% of the samples collected. For trip blanks, an unused sample cartridge was transported into the field with the sampling equipment. The trip blank cartridge was handled in the same manner as a sample, but a sample was not collected through this cartridge. The trip blank was returned to the lab with the other samples and analyzed. For ambient blanks, a randomly selected sampling cartridge was analyzed at the first daily location to detail interferences from cartridges or the analytical system.

Table II.1 summarizes the sample identification plan along with a description of quality control samples.

2.2. SAMPLE LOCATIONS AND DEPTHS

Table II.2 summarizes the sampling effort performed during this investigation, including a description of the collection dates, locations, depths, QA/QC identifications, and miscellaneous comments. The samples identified in Table II.2 were analyzed by the mobile laboratory. The variability of the identifications presented in the table is due to the discretion of the laboratory chemist, who for quality control purposes, would analyze some or all of the investigative, duplicate, or quality control samples collected at each location. Factors such as sample volume and sample dilution dictated whether the investigative or duplicate sample was analyzed. For ease of presentation, the base map included as Plate A is divided into six individual base maps within the text. These six base maps consist of Main Hill West, Main Hill East, Area J, Building 51 and Area 7, Main Parking Lot, and southwest of Main Hill. Sample locations within each of these areas are illustrated on Figures 2.1 through 2.6, respectively.

The discretionary sample locations and target depths were selected following completion of the sampling effort described in the PAW. Preliminary analytical results were distributed to personnel from U.S. EPA, OEPA, DOE, EG&G, and WESTON for review. Discussions were then held to select the additional 45 discretionary sample locations. Rationale for selection included the characterization of undefined areas, the better definition of nearby detected vapors, and the vertical profiling of contaminated areas.

Some deviations from the original work plan occurred during the field effort. The most common deviation was sampling depth, which was controlled by soil gas probe refusal depth. Table II.3 summarizes these deviations.

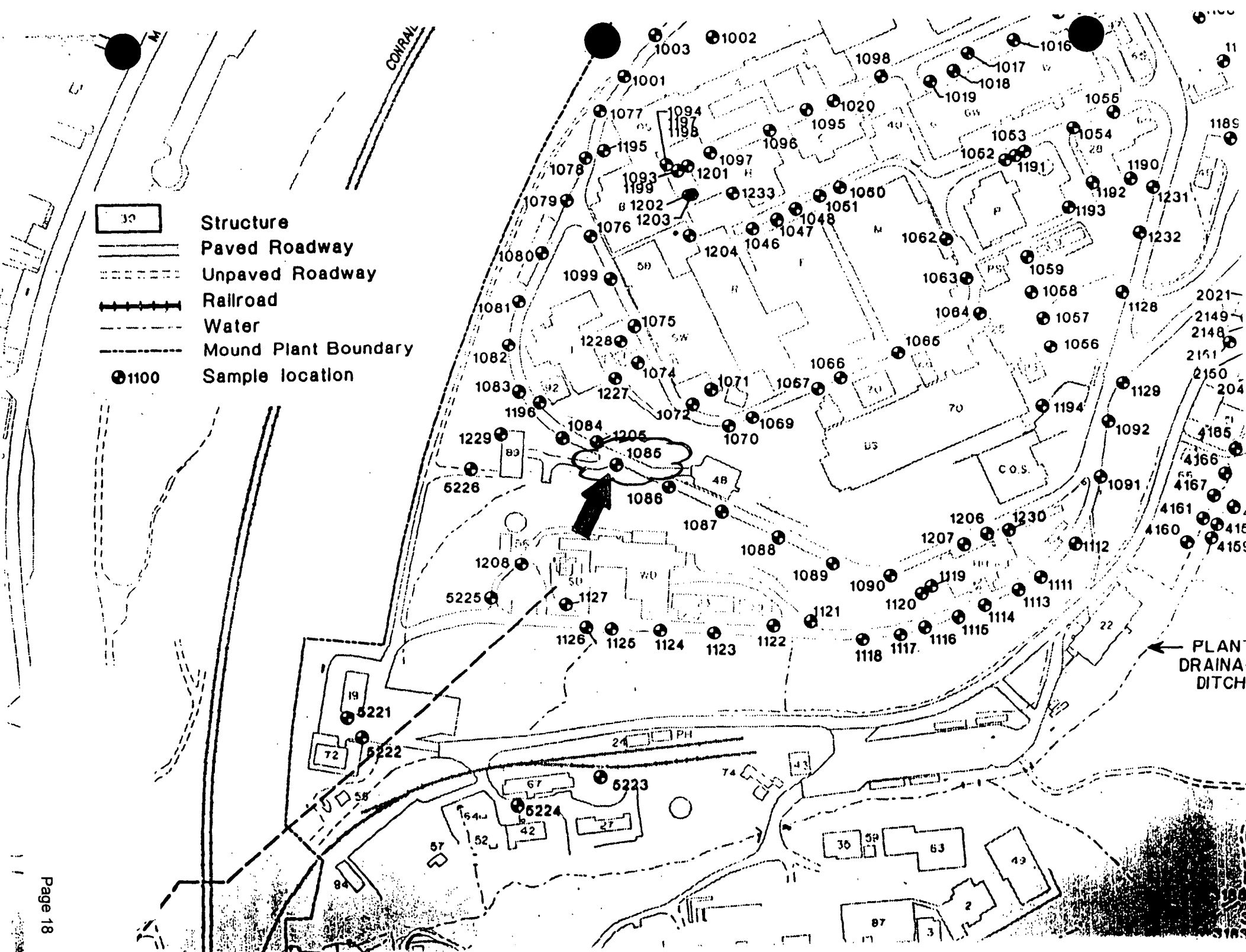

Structure
Paved Roadway
Unpaved Roadway
Railroad
Water
Mound Plant Boundary
1100 Sample location
CONRAIL
PLANT DRAINAGE DITCH

Table II.2. SUMMARY OF DATA IDENTIFCATIONS, LOCATIONS, AND DEPTHS

SAMPLE	DATE	LOCATION	SAMPLE DEPTH (FEET)	QA/QC
MND-01-1066-1005	8/11/92	Main Hill		Duplicate
MND-01-1067-0005	8/11/92	Main Hill	5	
MND-01-1069-1005	8/12/92	Main Hill		Duplicate
MND-01-1070-0005	8/12/92	Main Hill	5	
MND-01-1070-1005	8/12/92	Main Hill		Duplicate
MND-01-1070-2000	8/12/92	Main Hill		Trip Blank
MND-01-1071-0003	8/12/92	Main Hill	3	
MND-01-1071-3001	8/12/92	Main Hill		Ambient Blank
MND-01-1071-5000	8/12/92	Main Hill		Field Blank
MND-01-1072-0005	8/12/92	Main Hill	5	
MND-01-1072-1005	8/12/92	Main Hill		MS/MSD
MND-01-1074-0005	8/12/92	Main Hill	5	
MND-01-1074-1005	8/12/92	Main Hill		Duplicate
MND-01-1075-0005	8/12/92	Main Hill	5	
MND-01-1076-0005	8/12/92	Main Hill	5	
MND-01-1077-0005	8/12/92	Main Hill	5	
MND-01-1078-0005	8/13/92	Main Hill	5	
MND-01-1079-0005	8/13/92	Main Hill	5	
MND-01-1080-0005	8/13/92	Main Hill	5	
MND-01-1080-2000	8/13/92	Main Hill		Trip Blank
MND-01-1081-0005	8/13/92	Main Hill	5	
MND-01-1081-5000	8/13/92	Main Hill		Field Blank
MND-01-1082-0005	8/13/92	Main Hill	5	
MND-01-1082-1005	8/13/92	Main Hill		MS/MSD
MND-01-1083-0005	8/13/92	Main Hill	5	
MND-01-1083-1005	8/13/92	Main Hill		Duplicate
MND-01-1084-0005	8/13/92	Main Hill	5	
MND-01-1085-0005	8/13/92	Main Hill	5	
MND-01-1086-0005	8/13/92	Main Hill	5	
MND-01-1087-0005	8/13/92	Main Hill	5	
MND-01-1088-0005	8/13/92	Main Hill	5	
MND-01-1089-0005	8/13/92	Main Hill	5	
MND-01-1090-0005	8/13/92	Main Hill	5	
MND-01-1091-0005	8/14/92	Main Hill	5	
MND-01-1092-0005	8/14/92	Main Hill	5	
MND-01-1092-2000	8/14/92	Main Hill		Trip Blank
MND-01-1093-0005	8/15/92	Main Hill	5	
MND-01-1093-3002	8/14/92	Main Hill		Ambient Blank
MND-01-1093-5000	8/14/92	Main Hill		Field Blank
MND-01-1094-0005	8/14/92	Main Hill	5	
MND-01-1095-0002	8/14/92	Main Hill	2	
MND-01-1095-1002	8/14/92	Main Hill		MS/MSD
MND-01-1096-0003	8/14/92	Main Hill	3	
MND-01-1096-1003	8/14/92	Main Hill		Duplicate
MND-01-1097-0002	8/14/92	Main Hill	2	
MND-01-1098-0004	8/15/92	Main Hill	4	
MND-01-1099-0005	8/15/92	Main Hill	5	
MND-01-1099-2000	8/15/92	Main Hill		Trip Blank
MND-01-1100-0004	8/15/92	Main Hill	4	
MND-01-1100-2000	8/15/92	Main Hill		Trip Blank
MND-01-1100-3001	8/15/92	Main Hill		Ambient Blank
MND-01-1100-5000	8/15/92	Main Hill		Field Blank
MND-01-1101-0005	8/16/92	Main Hill	5	
MND-01-1101-3002	8/16/92	Main Hill		Ambient Blank
MND-01-1101-5000	8/16/92	Main Hill		Field Blank
MND-01-1102-0005	8/16/92	Main Hill	5	
MND-01-1102-1005	8/16/92	Main Hill		MS/MSD
MND-01-1103-0005	8/16/92	Main Hill	5	
MND-01-1103-1005	8/16/92	Main Hill		Duplicate
MND-01-1104-0003	8/16/92	Main Hill	3	
MND-01-1105-0005w	8/17/92	Main Hill	5	
MND-01-1105-1005w	8/17/92	Main Hill		Duplicate
MND-01-1105-2000w	8/17/92	Main Hill		Trip Blank
MND-01-1105-5000w	8/17/92	Main Hill		Field Blank
MND-01-1106-0003	8/16/92	Main Hill	3	
MND-01-1107-1005	8/16/92	Main Hill		Duplicate
MND-01-1108-0005	8/16/92	Main Hill	5	
MND-01-1109-0005	8/16/92	Main Hill	5	
MND-01-1110-0005	8/16/92	Main Hill	5	
MND-01-1110-2000	8/17/92	Main Hill		Trip Blank
MND-01-1111-0005	8/17/92	Main Hill	5	
MND-01-1111-5000	8/17/92	Main Hill		
MND-01-1112-0005	8/17/92	Main Hill	5	

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-01-1002-1003	28 JUL 92	---	---	---	---	---	---	---	40
MND-01-1003-0005	28 JUL 92	---	---	---	---	---	---	---	3 *
MND-01-1005-0005	28 JUL 92	---	---	---	---	---	---	---	21 *
MND-01-1007-0005	29 JUL 92	---	---	---	---	---	---	2	---
MND-01-1008-0005	29 JUL 92	---	---	---	---	---	---	---	5
MND-01-1008-1005	29 JUL 92	---	---	---	---	---	---	---	3
MND-01-1009-0005	29 JUL 92	---	---	---	---	---	---	4	19
MND-01-1010-0005	29 JUL 92	---	---	---	---	---	---	---	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	---	180	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	---	93	13	485	---	---	978	---
	14 AUG 92	---	---	---	---	---	---	6	8
	15 AUG 92	---	---	---	---	---	---	4	8 *
	16 AUG 92	---	865	---	---	---	---	---	8
	16 AUG 92	---	419	---	---	---	---	---	13
	16 AUG 92	---	329	---	---	---	---	6	---
	16 AUG 92	---	---	---	---	---	---	6	---
--1103-	16 AUG 92	---	---	---	---	---	---	8	13
01-1150-0005	16 AUG 92	---	---	---	---	---	---	---	255

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.

RECOMMENDATION
PRS 245

This soils location was identified as a PRS because of the detection of VOCs during the Mound Reconnaissance Sampling soil gas survey. The compounds identified were 111TCA, TCE, and Freon 113.

Calculations were performed converting the 10^{-6} Risk Based Guideline Values (given in mg contaminant per kg soil) to corresponding 10^{-6} Risk Based Guideline Values for soil gas concentrations (parts contaminant per parts soil gas). The results of the calculation showed that the 111TCA detection was approximately 8,000 times less than guideline criteria and the TCE detection was approximately 60 times less than guideline criteria (no guideline criteria exists for Freon 113). There is no additional history or survey which shows evidence of contamination at PRS 245.

Therefore, since the VOC detections establishing this soils location as a PRS have been shown not to be evidence of contamination and since there is no additional evidence of contamination and no reason to suspect contamination, PRS 245 is recommended for "no further action".

MOUND PLANT
PRS 245
SOIL CONTAMINATION - WD BUILDING

RECOMMENDATION:

This soils location was identified as a PRS because of the detection of VOCs during the Mound Reconnaissance Sampling soil gas survey. The compounds identified were 111TCA, TCE, and Freon 113.

Calculations were performed converting the 10^{-6} Risk Based Guideline Values (given in mg contaminant per kg soil) to corresponding 10^{-6} Risk Based Guideline Values for soil gas concentrations (parts contaminant per parts soil gas). The results of the calculation showed that the 111TCA detection was approximately 8,000 times less than guideline criteria and the TCE detection was approximately 60 times less than guideline criteria (no guideline criteria exists for Freon 113). Additionally, plutonium-238 and thorium-232 concentrations were below their guideline criteria of 25 pCi/g and 5 pCi/g respectively.

Therefore, since the VOC detections establishing this soils location as a PRS have been shown not to be evidence of contamination and since there is no additional evidence of contamination and no reason to suspect contamination, PRS 245 is recommended for "no further action".

CONCURRENCE:

DOE/MB: _____

Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: _____

Timothy J. Fischer, Remedial Project Manager (date)

OEPA: _____

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.