

# MOUND



**Environmental  
Restoration  
Program**

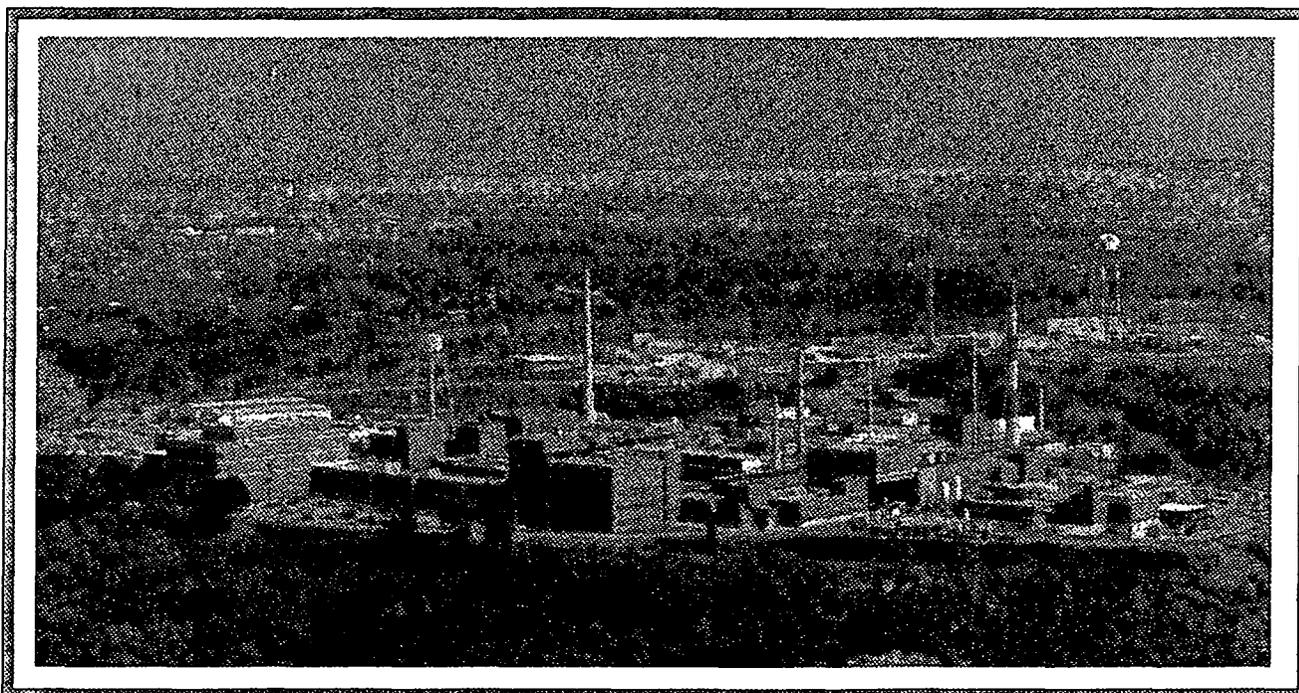


**OhioEPA**

# MOUND PLANT

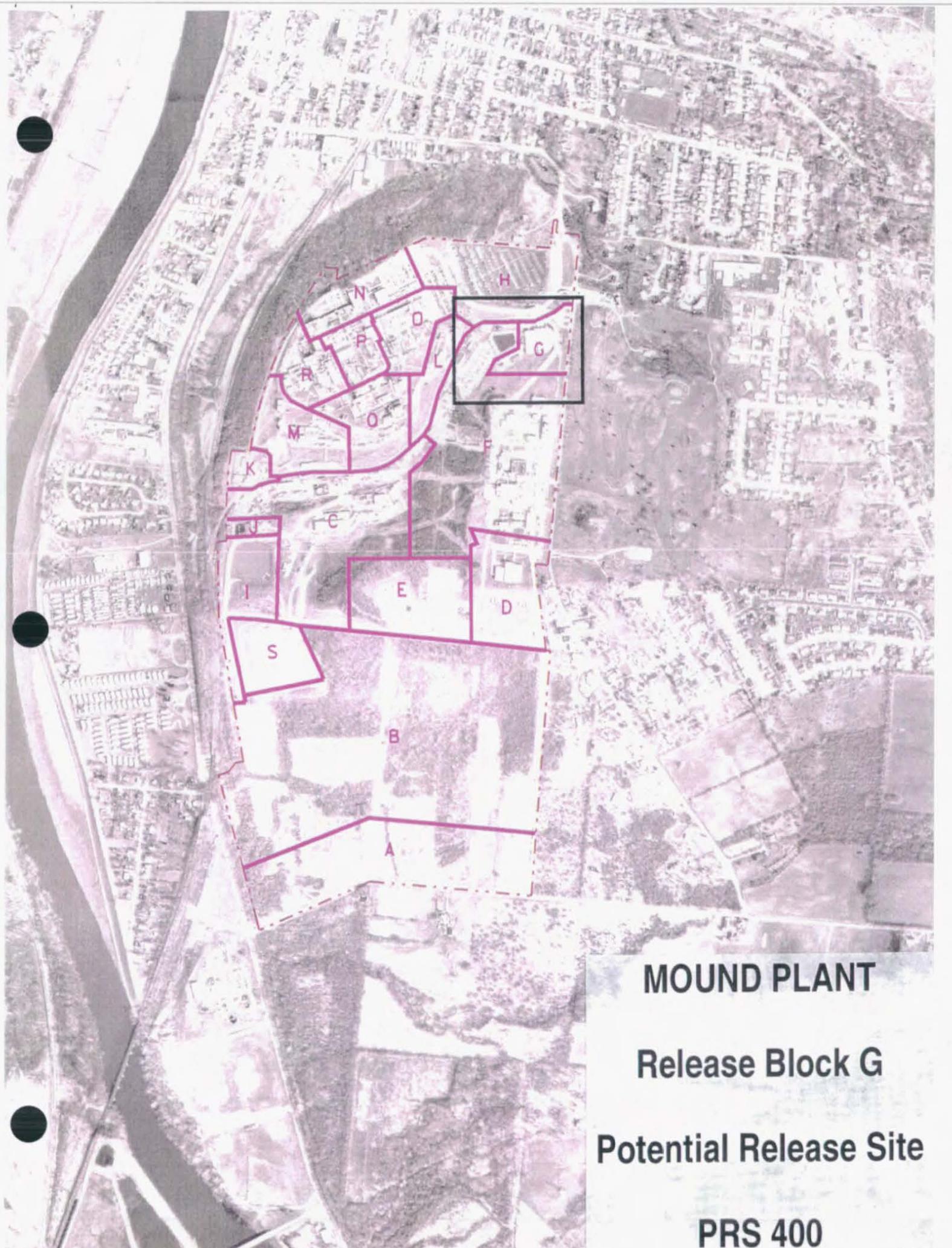
## Potential Release Site Package

### PRS # 400



PRS 400

REV	DESCRIPTION	DATE
0 PUBLIC RELEASE	Available for comment.	Dec. 17, 1996
1 FINAL		

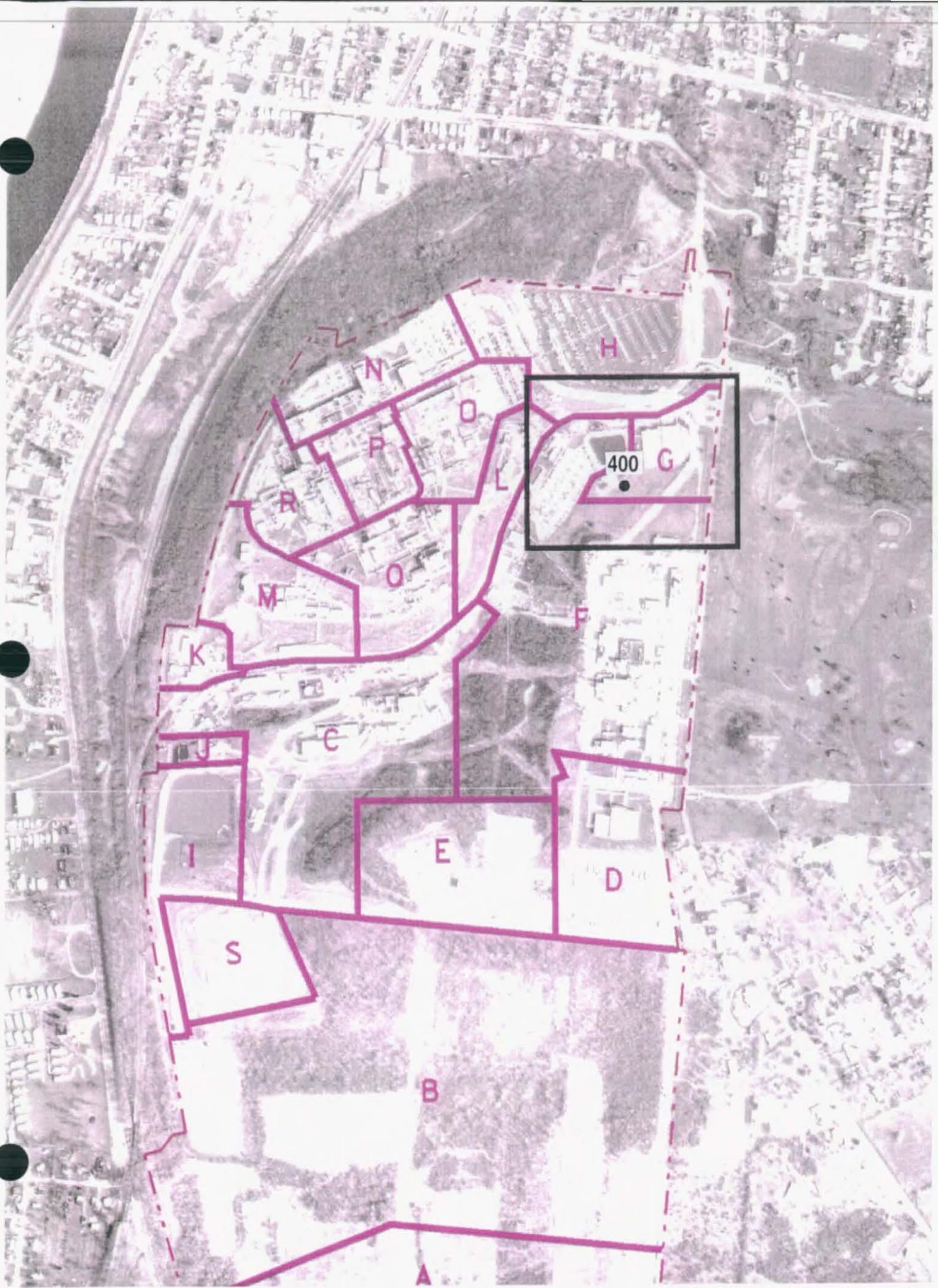


**MOUND PLANT**

**Release Block G**

**Potential Release Site**

**PRS 400**

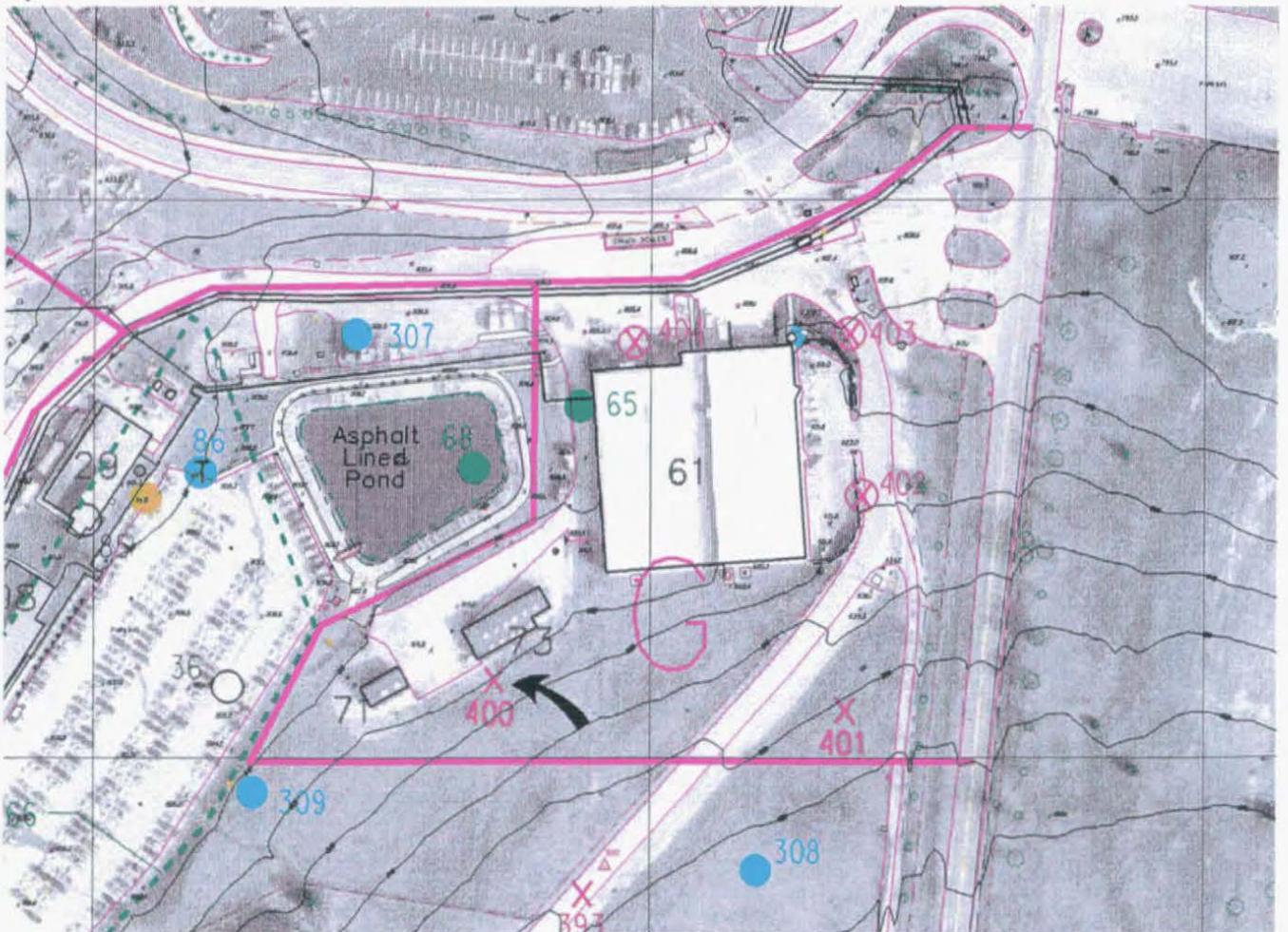
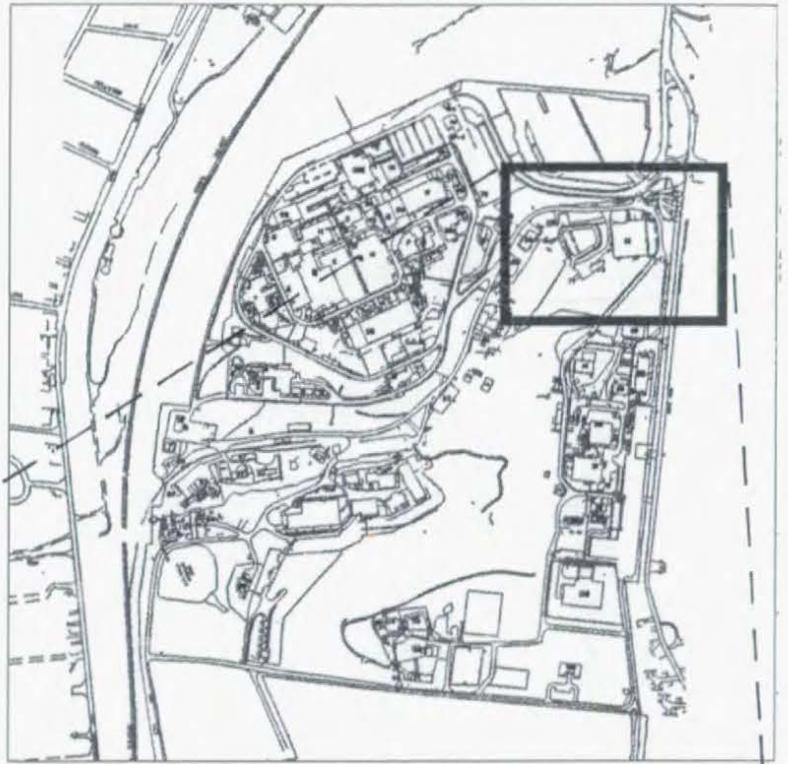


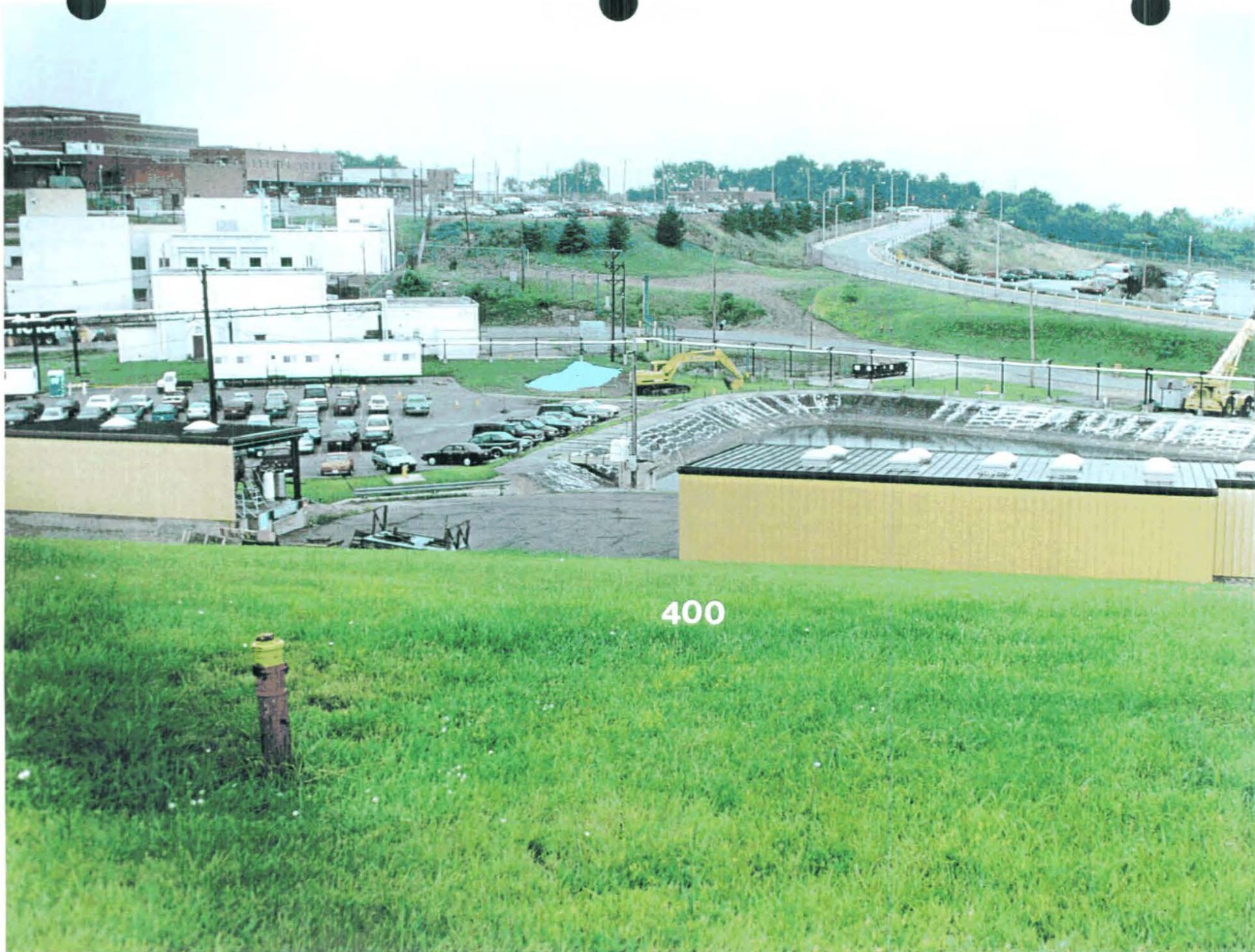
# MOUND PLANT

## Release Block G

### Potential Release Site

PRS 400





400

## PRS 400

### PRS HISTORY:

PRS 400 is a radiological soil location just off the pavement south of building 73. This PRS was created due to results of the Operable Unit 5, Operational Area Phase I Investigation, NON-AOC Field Report which was performed in June of 1994, which reported the presence of Plutonium-238.<sup>2</sup>

The limited historical data suggests that no radioactive or hazardous waste generating processes are known to have occurred at this location.

### CONTAMINATION:

In 1983 or 1984 the Radiological Site Survey Project investigated the soils on the Mound Plant Site for radionuclides by:

- screening using a sodium iodide detector (FIDLER) to identify areas of suspected radioactive contamination;
- sampling of surface and subsurface soil; and
- analysis of soil samples using one or more of the following methods: radiochemical analysis for plutonium-238 and thorium isotopes, gamma spectroscopy, and liquid scintillation for tritium.

This investigation took four samples in the vicinity of PRS 400, a core sample was taken just to the north, and three surface samples; one east, south, and west of this location.

Results found:<sup>1</sup>

Contaminant	Maximum Concentration	Guideline Value
Plutonium-238	1.42 pCi/g	25 pCi/g
Thorium	2.81 pCi/g	5 pCi/g

The 1994 OU5 Operational Area Phase I Investigation NON-AOC investigated locations around the Mound Plant site where previous investigations showed the potential of contamination. Soil samples were taken and analyzed for radionuclides.

Results found:<sup>2</sup>

Contaminant	Maximum Concentration	Guideline Value
Plutonium-238	25 pCi/g *	25 pCi/g
Thorium	No Detection	5 pCi/g

\* : 25 pCi/g is the Mound Soil Screening Facility Detection Limit for Plutonium-238

During the investigation Petrex: Relative Soil Gas data was taken at this location. Results indicated relatively low Hydrocarbon detections in the soil gas.

**READING ROOM REFERENCES:**

- 1) Operable Unit 9, Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993.  
(pages 6-14)
- 2) Operable Unit 5, Operational Area Phase I Investigation Non-AOC Field Report, June 1995.  
(pages 15-24)

**PREPARED BY:**

Gary Coons, Member of EG&G Technical Staff  
Jean Boling, Member of EG&G Technical Staff  
Dennis Gault, Member of EG&G Technical Staff

**MOUND PLANT  
PRS 400  
SOIL CONTAMINATION**

**RECOMMENDATION:**

This soils location was identified as PRS 400 due to a single plutonium-238 detection found during the OU5, Operational Area Phase I Investigation.

In 1994, a surface soil sample detected plutonium-238 at exactly 25 pCi/g. The 25 pCi/g detection is at the Mound ALARA (as low as reasonably achievable) level for plutonium and below the  $10^{-5}$  Risk Based Guideline Value. No other contaminants were detected. No processes are known to have occurred at this PRS that would have contributed to any contamination.

Therefore, since (1) the plutonium detection establishing this location as a PRS is equal to the concentration deemed "as low as reasonably achievable" and (2) the plutonium detection does not appear to be representative of contamination in the area (based on other sampling in the vicinity of PRS 400) and (3) since there is no additional laboratory data or history to support evidence of contamination, PRS 400 is recommended for NO FURTHER ASSESSMENT.

**CONCURRENCE:**

DOE/MB:

Arthur W. Kleinrath 12/17/96  
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA:

Timothy J. Fischer 12/17/96  
Timothy J. Fischer, Remedial Project Manager (date)

OEPA:

Brian K. Nickel 12/17/96  
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 400**

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 Bicon® 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  $\pm 75$  percent. The estimated error decreased with increasing sample activity; for samples with 25 to 100 pCi/g of plutonium-238, the estimated error was  $\pm 35$  percent, and for samples with  $> 100$  pCi/g, the estimated error was  $\pm 30$  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 ( $\pm 75$  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

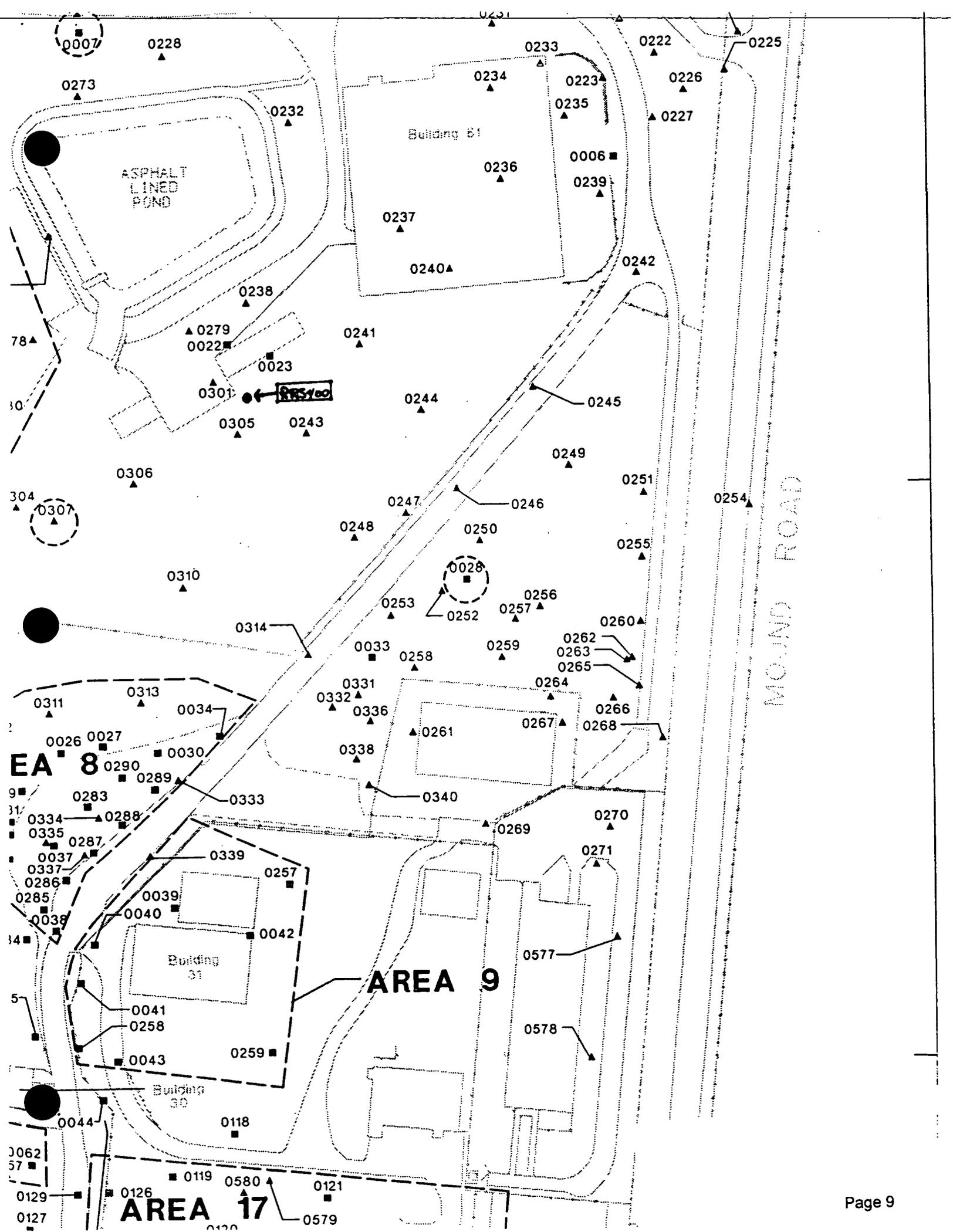
Samples with thorium concentrations in excess of 2 pCi/g by FIDLER screening were also radiochemically analyzed for thorium, resulting in the radiochemical analysis of about 12 percent of the samples. The LDLs for the thorium isotopes using radiochemical procedures were estimated to be

- 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.



# RADIOCHEMICAL ANALYSIS

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										
S0235	2050	1505	6750	08-84	0	0.09	b					
S0236	2075	1580	2867	10-83	0	10.35 <sup>c</sup>	b					
S0237	2075	1680	6751	08-84	0	0.02	b					
S0238	2075	1830	2864	10-83	0	0.09	b					
C0006	2100	1480	8354	11-84	54	0.03	3.24					
			8355	11-84	108	0.05	2.65					
S0239	2125	1505	2815	10-83	0	0.21	b					
S0240	2125	1655	6494	08-84	0	4.45	b					
S0241	2150	1755	2809	10-83	0	4.51	b					
S0242	2200	1505	2812	10-83	0	2.18	b	0.62				
S0243	2200	1830	6496	08-84	0	0.77	b					
S0244	2225	1730	6495	08-84	0	3.82	b		LDL	1.1	1.2	LDL
S0245	2250	1630	6498	08-84	0	0.46	b					
S0246	2300	1730	2811	10-83	0	0.92	b					
S0247	2300	1780	6499	08-84	0	3.82	b					
S0248	2300	1830	6497	08-84	0	9.00 <sup>c</sup>	3.73 <sup>c</sup>					
S0249	2325	1630	6502	08-84	0	3.92	b		LDL	1.4	1.2	LDL
S0250	2350	1730	6501	08-84	0	4.63	b					
S0251	2375	1580	2814	10-83	0	2.13	b					

GAMMA SPECTROSCOPY



# RADIOCHEMICAL ANALYSIS

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)
S0295	2075	2390	4090	10-83	0	0.64	b					
S0296	2075	2440	5984	07-84	0	1.56 <sup>c</sup>	16.59 <sup>c</sup>					
S0297	2075	2515	6756	08-84	0	0.31	b					
S0298	2085	2315	6758	08-84	0	3.01	20.52					
S0299	2085	2355	6755	08-84	0	0.41	b		LDL	LDL	1.2	LDL
S0300	2085	2365	6757	08-84	0	0.38	4.48					
C0022	2100	1860	8379	11-84	54	0.05	4.16					
			8380	11-84	80	0.02	2.53					
C0023	2125	1830	1801	05-83	18	0.18	2.81					
			1802	05-83	72	0.05	b					
			1803	05-83	90	0.03	b					
			1804	05-83	108	0.04	b					
C0024	2125	2200	1805	05-83	126	0.02	b					
			1806	05-83	144	0.01	b		LDL	LDL	0.8	LDL
			1807	05-83	156	0.02	b		LDL	LDL	0.9	LDL
S0301	2125	1885	6504	08-84	0	1.42	b					
S0302	2125	2110	6512	08-84	0	4.13	b					
S0303	2125	2160	2818	10-83	0	0.75	b					
S0304	2150	2085	6510	08-84	0	5.22	b		LDL	1.2	1.1	LDL
C0025	2150	2290	1815	05-83	12	6.60	3.90					
			1816	05-83	36	0.30 <sup>c</sup>	4.02 <sup>c</sup>		LDL	LDL	1	LDL
			1817	05-83	72	0.09	b					
			1818	05-83	90	0.05	b					
			1819	05-83	144	0.05	2.43					

# RADIOCHEMICAL ANALYSIS

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										
S0305	2175	1885	2819	10-83	0	0.09	b					
S0306	2175	1985	6505	08-84	0	4.82	b					
S0307	2175	2060	2821	10-83	0	5.36	6.46					
S0308	2225	2160	6509	08-84	0	1.06	b					
S0309	2225	2235	6508	08-84	0	1.70 <sup>c</sup>	b		LDL	1.1	1.2	LDL
S0310	2275	1985	6506	08-84	0	0.59	b					
S0311	2325	2135	6507	08-84	0	0.62	6.76					
S0312	2325	2185	6507	08-84	0	0.75	b					
S0313	2350	2060	2817	10-83	0	6.28 <sup>c</sup>	28.73 <sup>c</sup>	1.12				
C0026	2362.7	2142.4	None <sup>d</sup>	07-84	0	NR	13					
			None <sup>d</sup>	07-84	12	NR	17					
			None <sup>d</sup>	07-84	24	NR	33					
			None <sup>d</sup>	07-84	36	NR	37					
			None <sup>d</sup>	07-84	48	NR	30					
			None <sup>d</sup>	07-84	60	NR	34					
			None <sup>d</sup>	07-84	72	NR	37					
			None <sup>d</sup>	07-84	84	NR	36					
			None <sup>d</sup>	07-84	96	NR	39					
			None <sup>d</sup>	07-84	108	NR	39					
			None <sup>d</sup>	07-84	120	NR	34					
C0027	2371.9	2104.9	None <sup>d</sup>	07-84	0	NR	8.3					
			None <sup>d</sup>	07-84	12	NR	29					
			None <sup>d</sup>	07-84	24	NR	35					
			None <sup>d</sup>	07-84	36	NR	53					
			None <sup>d</sup>	07-84	48	NR	43					
			None <sup>d</sup>	07-84	60	NR	34					

I 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	0.6					
			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					
			None <sup>d</sup>	07-84	72	NR	0.8					
C0291	2915.3	2490.3	None <sup>d</sup>	07-84	0	NR	0.6					
			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	0.6					
			None <sup>d</sup>	07-84	120	NR	0.3					
			None <sup>d</sup>	07-84	132	NR	0.3					
S1092	2185	3362	8413	12-84	1	0.31	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.

LDL - The sample result was below the Lower Detection Limit, which was estimated to be 0.5 pCi/g for cesium-137, cobalt-60, and americium-241. The LDL for radium-226 or actinium-227 was estimated to be 1 pCi/g.

NR - No result provided. (Note: no samples were taken for plutonium-238 when *in situ* gamma spectrometry was performed.)

Environmental Restoration Program

**OPERABLE UNIT 5  
OPERATIONAL AREA PHASE I INVESTIGATION  
NON-AOC FIELD REPORT**

**MOUND PLANT  
MIAMISBURG, OHIO**

**VOLUME II - APPENDICES A-G**

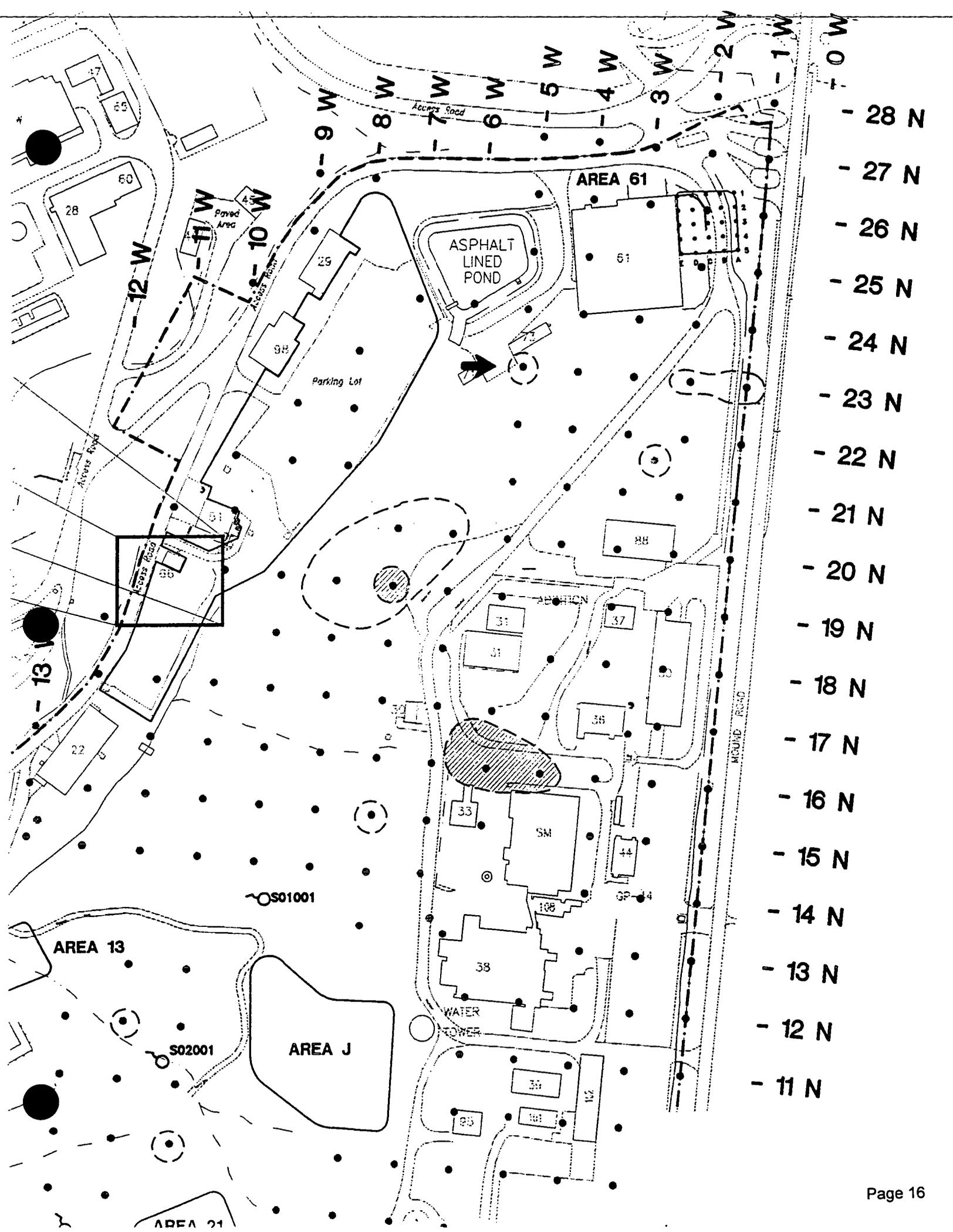
**June 1995**

**Final (Revision 0)**

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



**EG&G Mound Applied Technologies**



- 28 N
- 27 N
- 26 N
- 25 N
- 24 N
- 23 N
- 22 N
- 21 N
- 20 N
- 19 N
- 18 N
- 17 N
- 16 N
- 15 N
- 14 N
- 13 N
- 12 N
- 11 N

Table II.2. Summary of Elevated Surface Radiological Activity in  
 Non-AOC (FIDLER Survey)  
 Page 5 of 5

Location	Channel 1 (cpm)		Channel 2 (kcpm)		Out Channel (kcpm)
	CC	RDG	CC	RDG	RDG
15N11	165.3	--	7.6	8.5	a
16N1	236.8	--	9.9	10.5	a
16N4	130	150	5.2	9.0	a
17N8	165.3	--	7.6	8.0	a
18N6	130	--	5.2	6.5	a
18N6.5	165.3	460	7.6	46	40
18N8		170		11.0	a
18N9		--		10.5	a
19N7	170.9	325	7.1	20.0	45.0
19N9		--		9.5	a
20N2	130	--	5.2	6.5	a
20N3		--		6.5	a
20N4	170.9	--	7.1	7.5	a
20N6		375		22.0	30.0
20N7		325		22.5	45.0
21N3		--		8.0	a
21N5	149.4	--	6.7	10.0	a
22N4		--		9.5	a
22N5		--		8.0	a
23N1	236.8	--	9.9	10.5	a
23N5	149.4	--	6.7	7.0	a
24N4	170.9	--	7.1	7.5	a

CC contamination criteria  
 cpm counts per minute  
 kcpm counts per minute times 1000  
 RDG FIDLER reading  
 a Out Channel readings were not measured at individual grid locations  
 -- Reading taken did not exceed CC

**FIDLER DATA**

completed at background stations, provided a statistical basis to determine if survey locations were contaminated. Background station locations were selected based on the terrain to be surveyed and were assumed not to be contaminated based on knowledge of previous site activities. At each background station, Channel 1 readings were taken and recorded in counts per minute (cpm). Channel 2 readings were taken and recorded in counts per minute x 1000 (kcpm). The standard deviations and the contamination criteria (CC) were calculated for Channels 1 and 2 (see Appendix A.1).

Table II.1 presents the background station information for the Non-AOC survey. The background station (not shown in Table II.1) for the Building 61 survey was established using FIDLER #2 (Instrument #3400, Probe #3611) at grid location A1 in Area 61.

**Table II.1. FIDLER and Background Station Information for the Non-AOC**

Date	FIDLER #	Instrument #	Probe #	Background Station
6/20/94	#1	#3712	#3713	SAIC Trailer Stake 3N4
	#2	#3400	#3611	
6/21/94	#1	#3712	#3713	Stake 3N4
	#1	#3712	#3713	Stake 1N16
	#2	#3400	#3611	Stake 3N4
	#2	#3400	#3611	Stake 1N16
6/22/94	#2	#3400	#3611	Stake 8N1
6/23/94	#2	#3400	#3611	Stake 8N2
	#2	#3400	#3611	Stake 4N23
6/27/94	#2	#3400	#3611	Stake 20N6
	#2	#3400	#3611	Stake 26N5
6/28/94	#2	#3400	#3611	Stake 8N2
6/29/94	#2	#3400	#3611	Stake 12N27
6/30/94	#2	#3400	#3611	Stake 3N13
7/6/94	#2	#3400	#3611	Stake 8N22
7/7/94	#2	#3400	#3611	Stake 11N22
7/21/94	#2	#3400	#3611	Stake 11N16



Table II.3. Summary of Elevated Surface Soil Radiological Activity  
Page 2 of 2

**MOUND SOIL  
SCREEN DATA**

Grid Location <sup>a</sup>	Mound Soil Screening Facility Data	
	Plutonium-238 (pCi/g)	Thorium-232 (pCi/g)
6N9	33	ND
6N14	30	ND
6N16	29	ND
6N17	25	ND
6N19	39	ND
7N14	27	ND
7N18	26	ND
7N23	25	1
9N10	25	ND
11N11	25	ND
12N15	85	ND
15N7	30	ND
16N4	78	ND
16N5	243	ND
19N7	56	15.9
19N8	25 39	2.4 ND
20N6	27	2.6
20N7	37	14.7
22N4	ND	2.0
23N1	25	ND
23N2	26	1
23N5	25	ND
B18001 (Building 24)	38	6.7
21.5N2.5	25	ND

<sup>a</sup> See Plate 1 for grid location

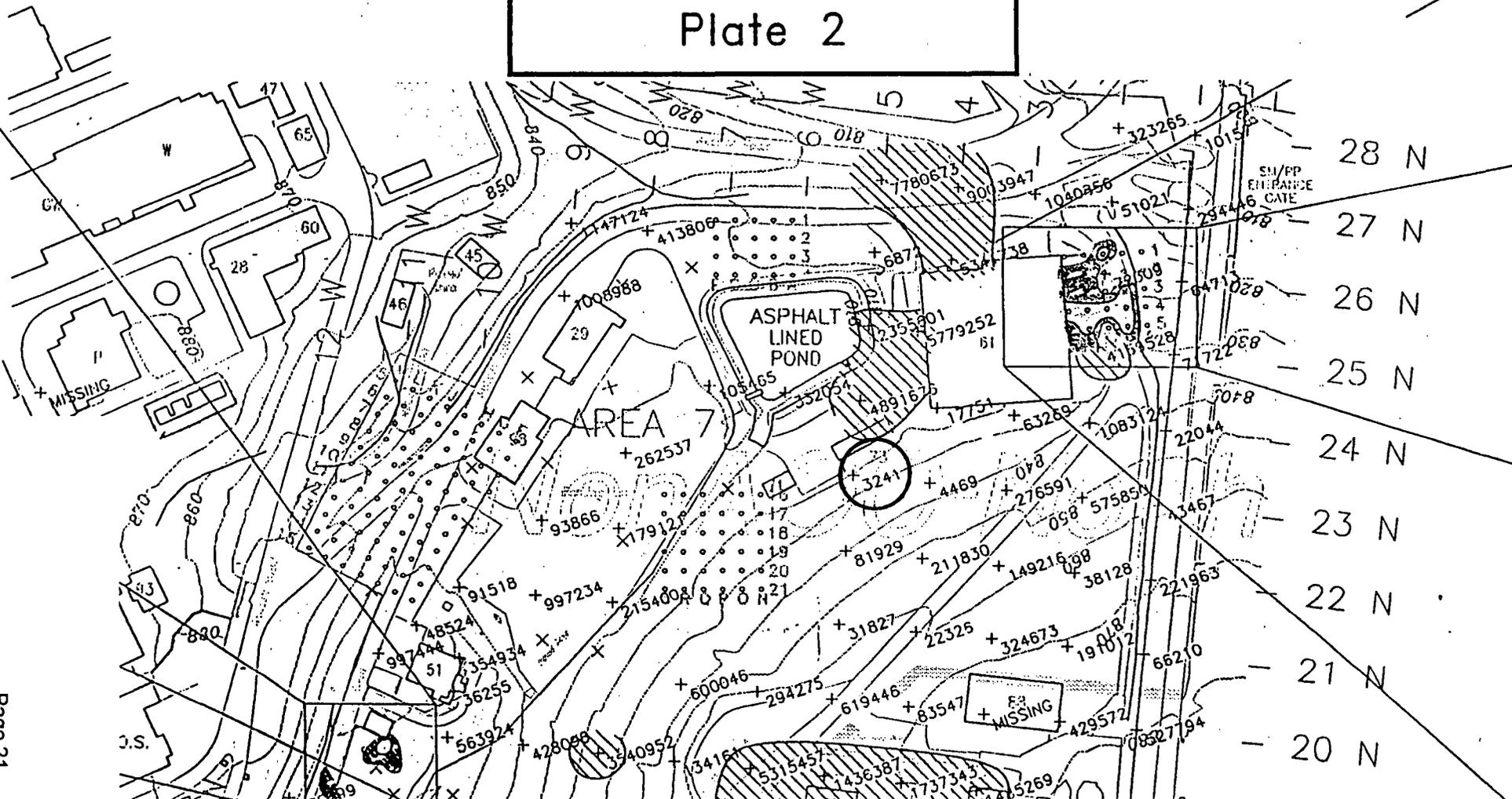
ND Radiological contamination not detected above the Mound Plant Soil Screening Facility detection limits of 25 pCi/g for Pu-238 and 2 pCi/g for Th-232

LEGEND				
Relative Response Values (in ion counts):				
NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61
⊗ ≥ 4,200,000	⊗ ≥ 20,000,000	⊗ ≥ 5,000,000	⊗ ≥ 10,000,000	⊗ ≥ 5,000,000
⊗ 850,000-4,199,999	⊗ 2,000,000-19,999,999	⊗ 850,000-4,999,999	⊗ 1,500,000-9,999,999	⊗ 1,400,000-5,799,999

Relative Response  
 Total Aromatic  
 Hydrocarbons  


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 Plate 2

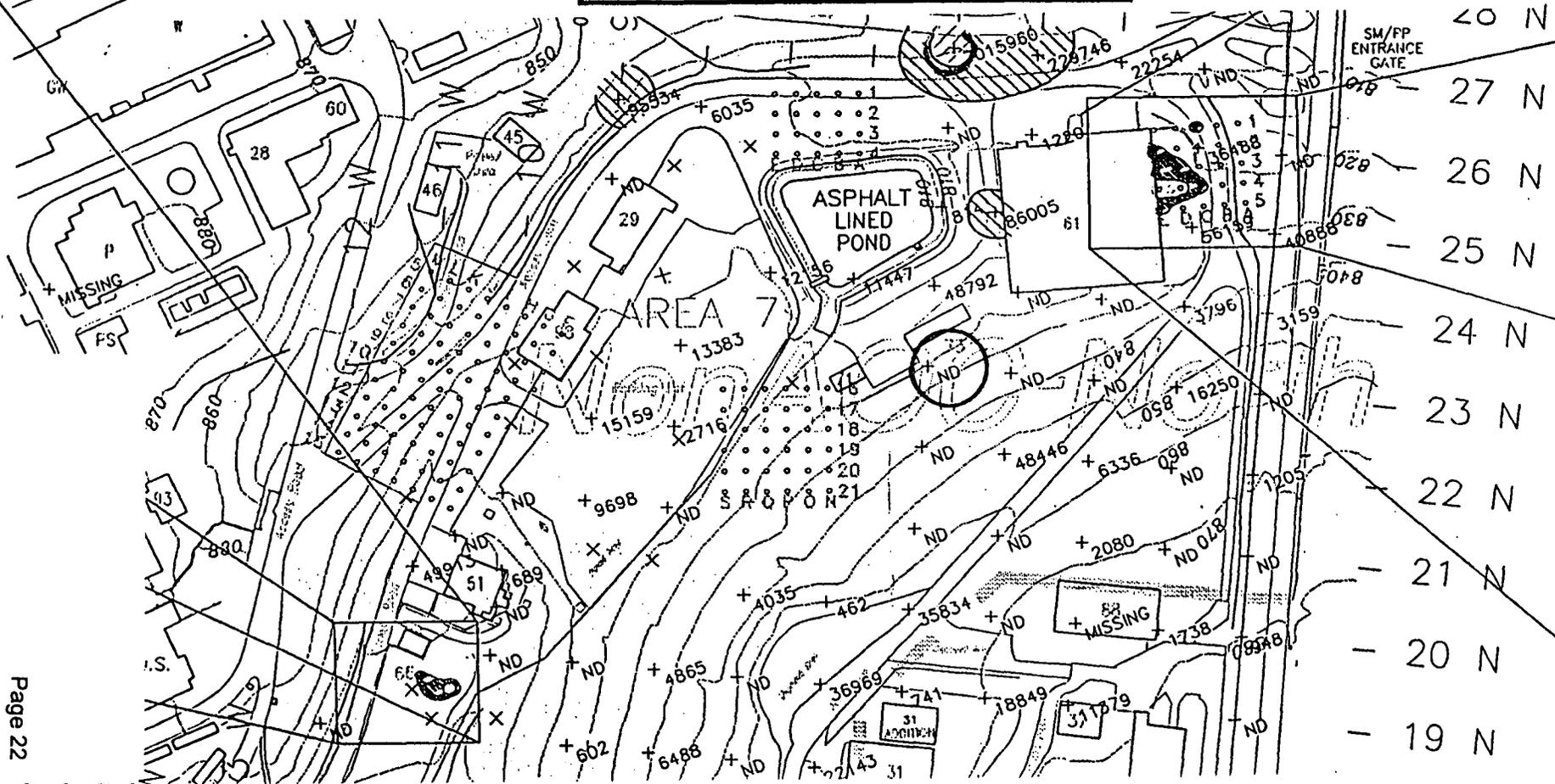


LEGEND				
Relative Response Values (in ion counts):				
NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61
≥ 20,000	≥ 1,000,000	≥ 100,000	≥ 800,000	≥ 1,400,000
7,000-69,999	100,000-999,999	30,000-299,999	90,000-799,999	180,000-1,399,999

Relative Response  
 Total Semivolatile  
 Hydrocarbons  

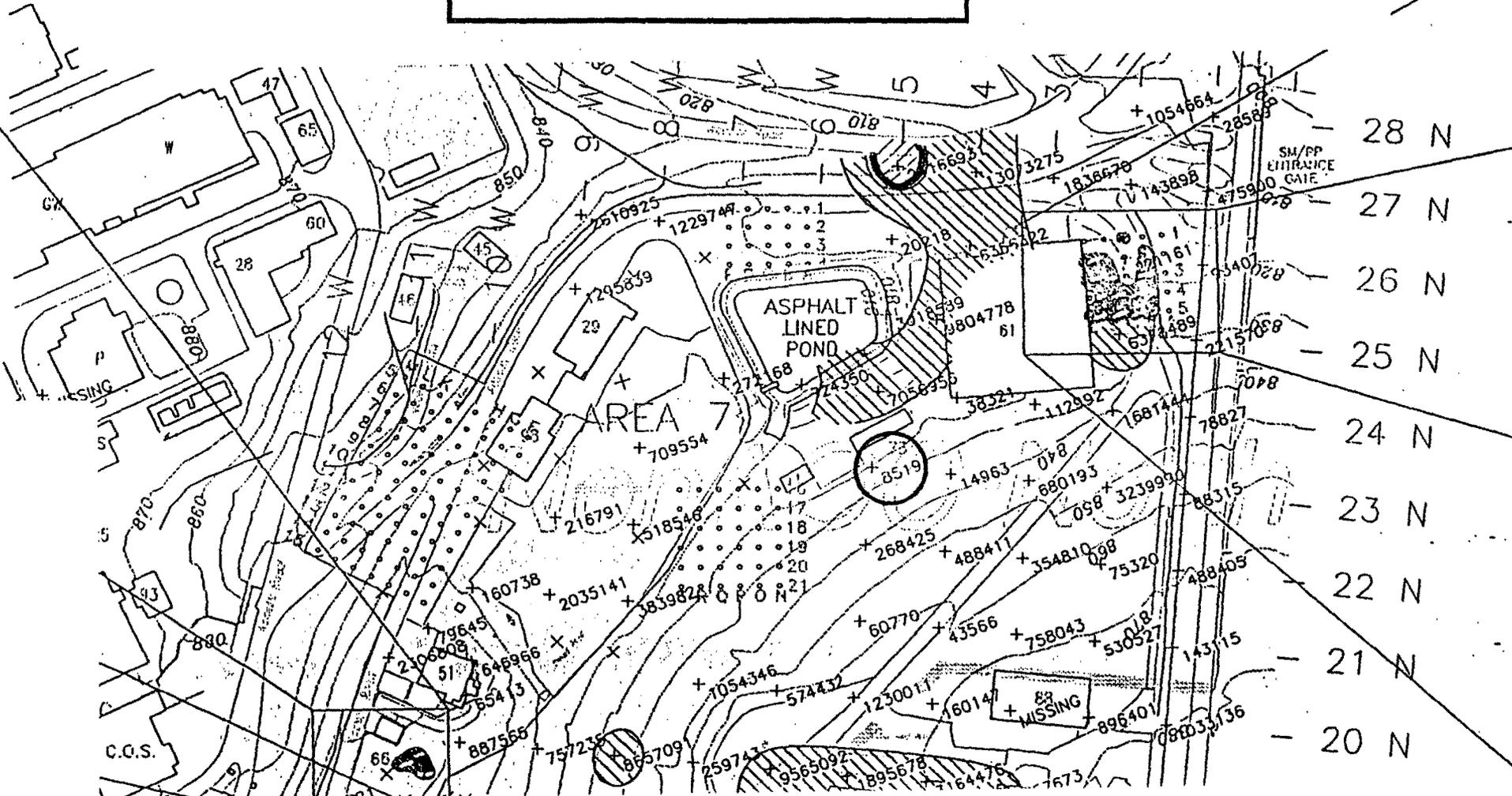

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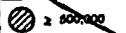
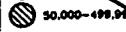
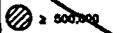
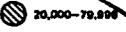
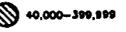
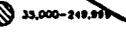
 Plate 3



LEGEND				
Relative Response Values (in ion counts):				
NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61
⊙ ≥ 4,000,000	⊙ ≥ 29,000,000	⊙ ≥ 11,000,000	⊙ ≥ 23,000,000	⊙ ≥ 25,000,000
⊙ 1,500,000-7,999,999	⊙ 3,000,000-28,999,999	⊙ 1,600,000-10,999,999	⊙ 4,000,000-22,999,999	⊙ 3,000,000-24,999,999

Relative Response  
 Total C5-C11  
 Petroleum Hydrocarbons  
 Plate 4



LEGEND				
Relative Response Values (in ion counts):				
NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61
 ≥ 600,000  50,000-499,999	 ≥ 600,000  50,000-499,999	 ≥ 80,000  20,000-79,999	 ≥ 400,000  40,000-399,999	 ≥ 250,000  35,000-249,999

Relative Response  
 Total Halogenated  
 Hydrocarbons  


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 Plate 5

