EG&G MOUND-30-03-04-01--9703180019

MOUND

Environmental
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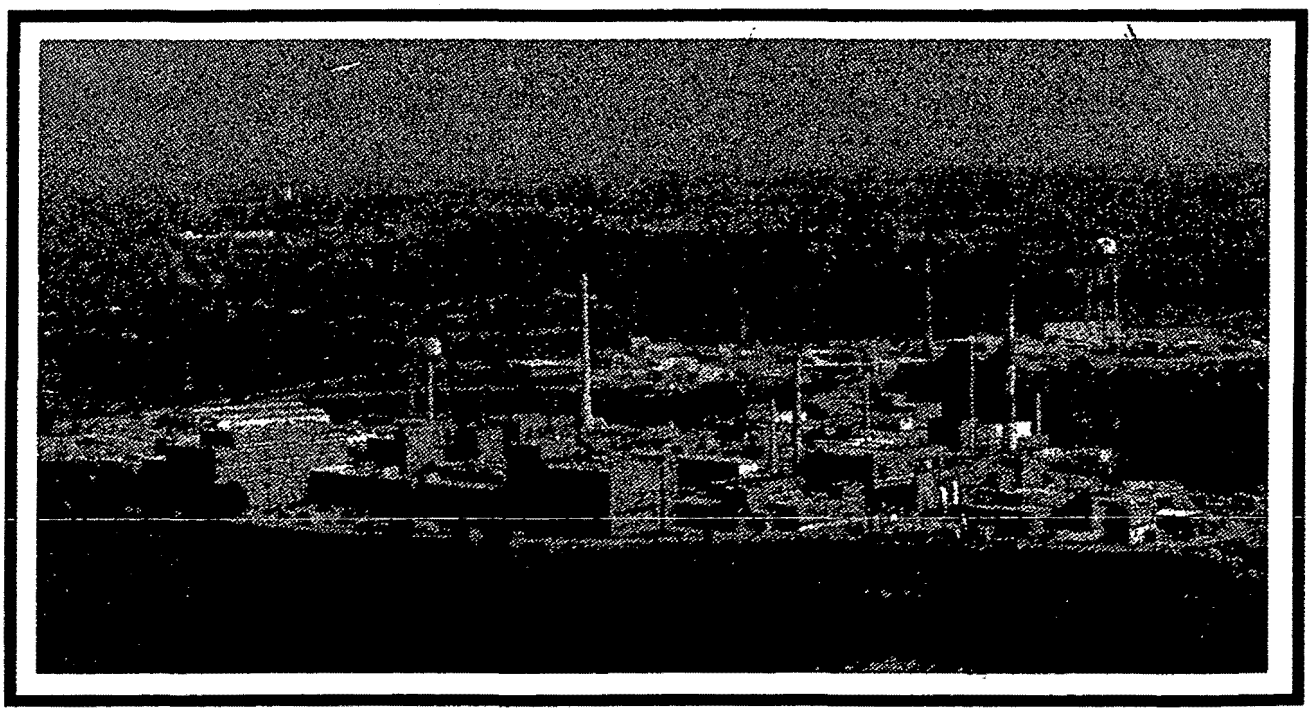
Program

MOUND PLANT
Potential Release Site Package
PRS # 273



MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PACKAGE

Notice of Public Review Period

OhioEPA

The following potential release site (PRS) packages will be available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio beginning January 30, 1997. Public comment will be accepted on these packages from January 30, 1997, through March 6, 1997.

PRS 244: Soil Contamination - B Building
PRS 273: Soil Contamination - Area 12 (SM/PP Hillside)
PRS 309: Soil Contamination - Radiological Survey Site Location S0307
PRS 315/316/319: Waste Transportation Vehicles, Trash Dumpsters, Epoxy Resin Waste Storage Site - Building 49
PRS 332: Waste Oil Tank - Building G (used engine oil)
PRS 338: Septic Tank - Building 29
PRS 400: Soil Contamination
PRS 401: Soil Contamination

Questions can be referred to Mound's Community Relations at (937) 865-4140.

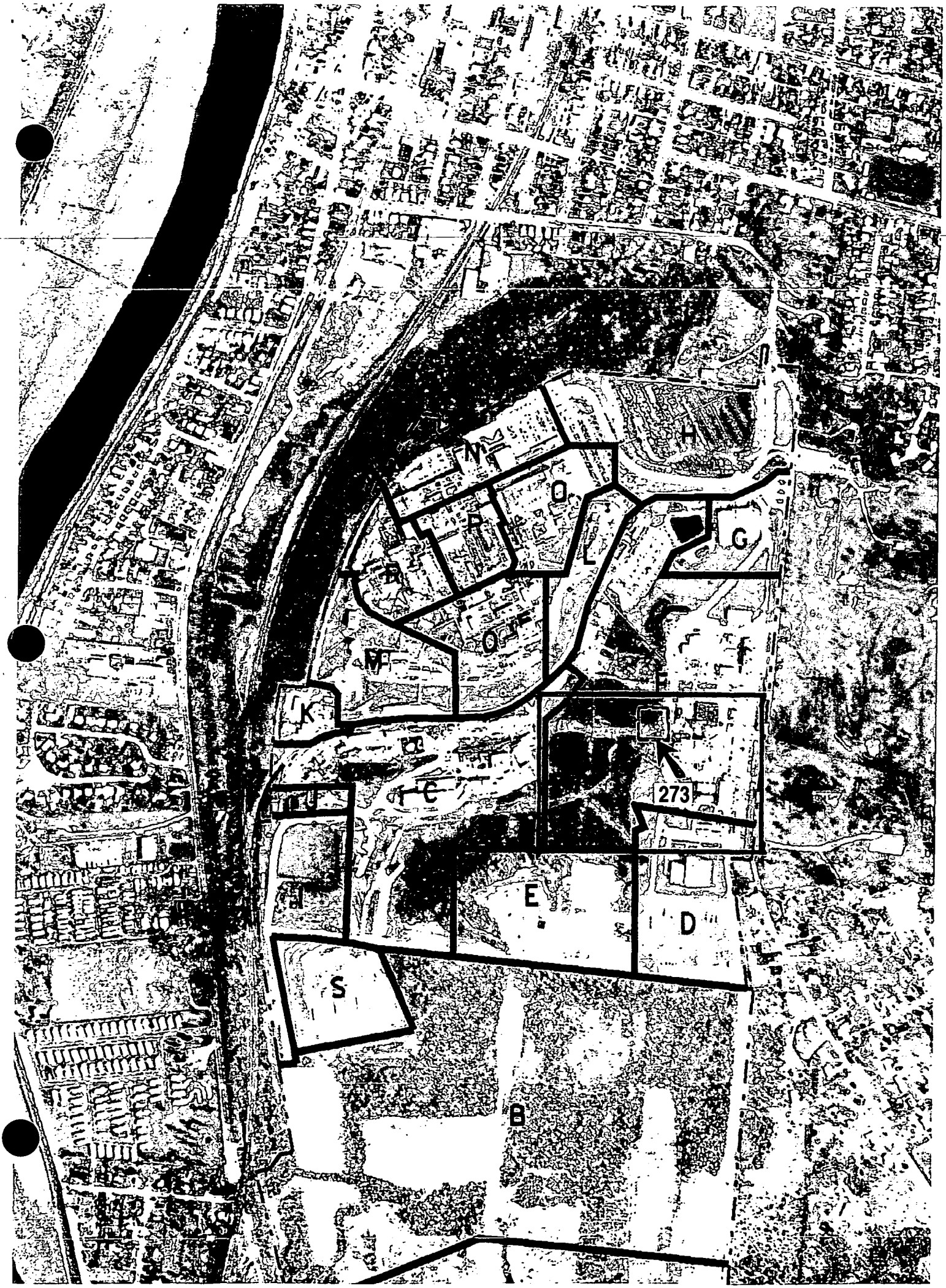
REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comment.	Dec. 17, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Mar. 11, 1997

MOUND PLANT

Release Block F

Potential Release Site

PRS 273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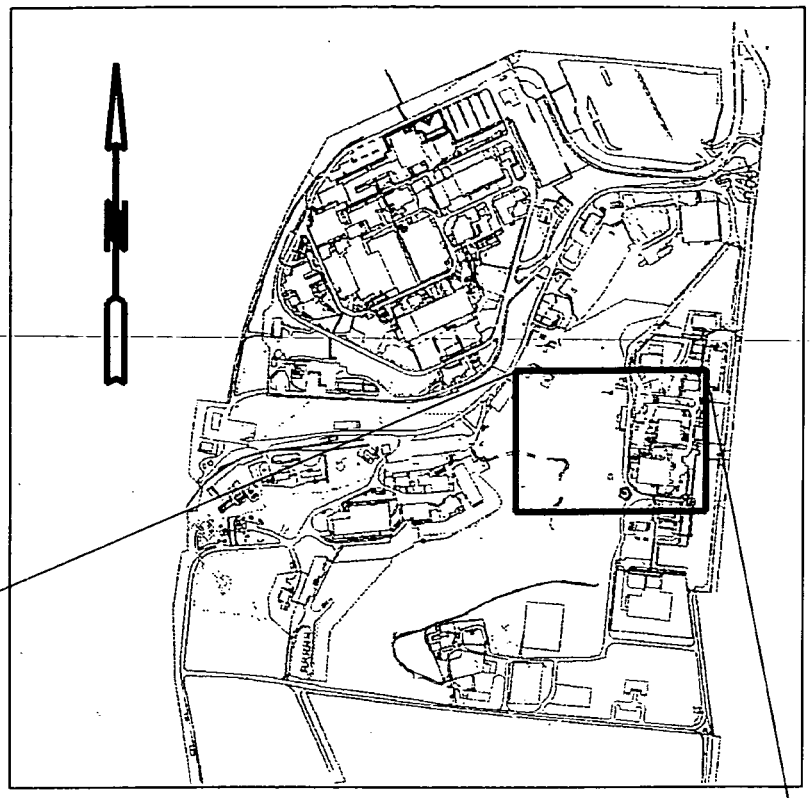
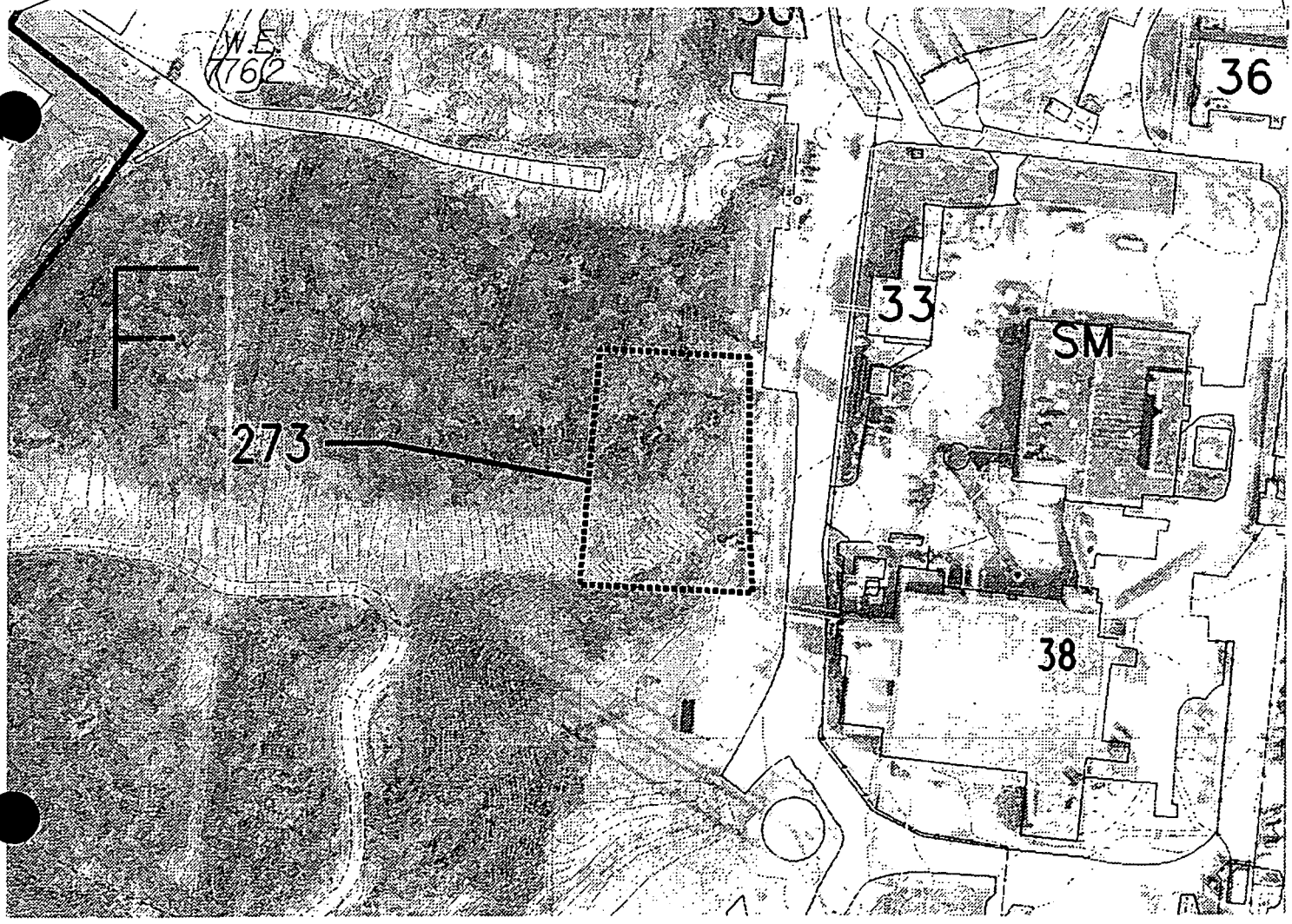
Mound Plant

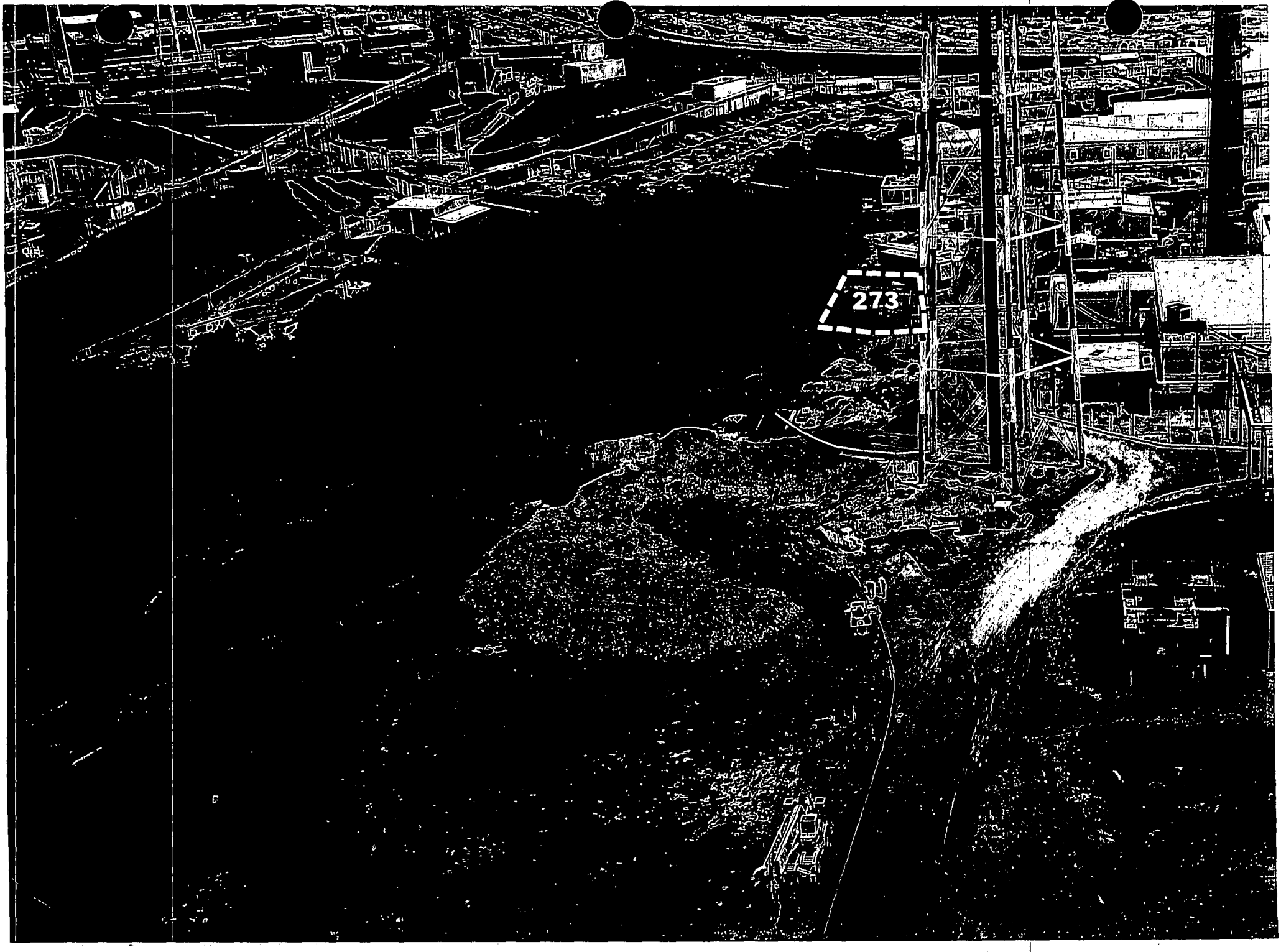
Release Block F

Potential Release Site

PRS 273






273

PRS 273

PRS HISTORY:

PRS 273 (also known as Area 12) is an area of soil located west of Building 38 and the Special Metallurgical Building on the SM/PP (Special Metallurgical Building/Plutonium Processing Building) hillside. PRS 273 was created from historical evidence citing the dumping of radioactively contaminated soil from both the SM Building and area one.[2] This area covers approximately 19,000 feet.[2]

In 1965, thorium-232 contaminated soil was scraped from area 1 and placed in PRS 273. Also in 1965, plutonium-238 and thorium-232 contaminated soil from the SM Building was placed in PRS 273.[2]

The Waste Transfer System pipeline (now removed) which carried radioactive waste from Building 38 to the Waste Disposal Building (WD) passed through the west side of PRS 273.[2]

CONTAMINATION:

1) The 1983 Radiological Site Survey[3] investigated radionuclides via Mound Soil Screening, radiochemistry and gamma spectroscopy. Results from this investigation showed:

Contaminant	Maximum Concentration Detected	Guideline Criteria
Plutonium	313 pCi/g (in soil surface)	25 pCi/g (Mound ALARA in soil)
Thorium	190 pCi/g (in soil surface	5 pCi/g[9] (in surface soil)

NOTE: ALARA = As Low As Reasonable Achievable, pCi/g = picocurries/gram

2) In 1994, a PETREX soil gas study of PRS 273 found no evidence of relatively elevated hydrocarbons the soil.[5]

3) In 1995, the Other Soils Characterization[8] divided up PRS 273 into 15 foot by 15 foot grids and analyzed soil samples for organics (by organic vapor analyzer and or organic vapor meter), metals (by x-ray fluoroscope) and radionuclides (field analysis by FIDLER and lab analysis by gamma spectroscopy). Samples were collected every four feet until a depth of 12 feet or refusal was reached. Sample results showed:

Contaminant	Maximum Concentration Detected	Guideline Criteria
Plutonium	301 pCi/g (in subsurface soil)	25 pCi/g (Mound ALARA in subsurface soil)
Thorium	212 pCi/g (in subsurface soil)	15 pCi/g[9] (in subsurface soil)

- All metal detections were below the 10^{-6} Risk Based Guideline Criteria for soils.
- Volatile organic compounds (VOCs) were detected in twelve samples. However, no quantitative data exists.

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 6-8)
2) OU9, Site Scoping Report: Volume 7 - Waste Management, February 1993. (pages 9-12)
3) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 13-19)
4) Preliminary Review/Visual Site Inspection for RCRA Facility of Mound Plant, July 1988. (pages 20-21)
5) OU5, Operational Area Phase I Investigation Non-AOC Field Report, June 1995. (pages 22-26)
6) Mound Site Survey Project for the Characterization of Radioactive Materials in Site Soils, May 1988. (pages 27-32)

OTHER REFERENCES:

7) Risk Based Guideline Criteria. (pages 33-35)
8) Other Soils Characterization Report, Draft, January 1996. (pages 36-45)
9) Code of Federal Regulations, 40CFR192.12 and 192.41.

PREPARED BY:

Jean Boling, Member of EG&G Technical Staff
George Liebson, Member of EG&G Technical Staff

MOUND PLANT
PRS 273
SOIL CONTAMINATION - AREA 12 (SM/PP HILLSIDE)

RECOMMENDATION:

This soils area was identified as a PRS due to historic use as a disposal site for radiologically contaminated soil.

Plutonium exists at 12 times the Mound ALARA goal of 25 pCi/g and thorium exists at 40 times the regulatory standard of 5 pCi/g. No other contaminants have been identified at levels of concern. Because this area is heavily vegetated, there is no immediate threat for migration of the contamination. However, there would be unacceptable exposure to a construction worker.

Therefore, since plutonium and thorium exist in the soil of PRS 273 at levels which present an unacceptable risk to potential future construction activities a RESPONSE ACTION is recommended.

CONCURRENCE:

DOE/MB: Arthur W Kleinrath 11/26/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fisch 12/3/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian K. Nickel 12/12/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 1/30/97 to 3/6/97

☒ No comments were received during the comment period.

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

REFERENCE MATERIAL
PRS 273

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
272	Area 10, Concrete Debris	G-8 G-9	Grounds	Polonium-210, Cobalt-60, Plutonium-238 (from runoff)	1, 4, 5, 18	Suspected	S	4, 6	14	Table B.1 (Table III.6 in Ref. 6)	6
273	Area 12, Thorium-Contaminated Soil from Area 1	G-9	Grounds	Thorium, Plutonium-238 (from runoff)	1, 4, 5, 18	Suspected thorium	S	4, 6	14, 15	Table B.1 (Table V.5 in Ref. 6)	6
274	Area 21, Old Bunker	H-9	Grounds	Cesium-137, Strontium-90, Actinium-227, Radium-226	4, 5, 18	Suspected thorium	S	4, 6	14, 15, 16	Table B.1 (Table VII.2 in Ref. 6)	6
275	Area 21, Detonator Shack	H-8	Grounds	Cesium-137, Strontium-90, Actinium-227, Radium-226	4, 5, 18	Suspected thorium	S	4, 6	14, 15, 16	Table B.1 (Table VII.2 in Ref. 6)	6
276	Area 22, Orphan Soil from other Areas	I-8	Inactive	Polonium-210, Radium-226, Cobalt-60, Plutonium-238, Cesium-237	4, 5, 18	Suspected	S	6	14, 15, 16	Table B.1 (Table X.1 in Ref. 6)	6
277	Area J, Hillside Disposal Area (AKA Dredged Material Disposal Area 11a)	H-8 H-9	Historical	Construction/building debris, Paints, Thinners, Chemical contaminants, Asbestos, Thorium, Plutonium-238	1, 4, 18	Suspected VOCs	S	4	1 14, 15, 16	SGS[b] Table B.2 Table B.1 (Table X.2 in Ref. 6)	12 6
278	Area J, Hillside catch basin	H-8	In service	Plutonium-238 (from runoff)	1, 4, 18	Suspected	SW	18	No Data		
279	Old Firing Range Drum Storage Area	H-9	Historical	Liquid chemical wastes	5, 18	Confirmed VOCs	S	4	1 2, 3, 4, 5, 6 14, 15	SGS[b] Table B.2 Locations 3152, 3153, and 3187 Tables B.6, B.7, B.8, and B.9 RSS[c] Locations S0162, S0163, and S0647 (Appendix E in Ref. 6)	12 7 6

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

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

Reference List

1. DOE 1986 "Phase I: Installation Assessment Mound [DRAFT]."
2. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
3. DOE 1992c "Mound Plant Underground Storage Tank Program Plan & Regulatory Status Review (Final)."
4. DOE 1993a "Site Scoping Report: 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 Scping 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, OU6, (FINAL)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scpoing 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."

Document Control No. _____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

February 1993

FINAL
(Revision 0)

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

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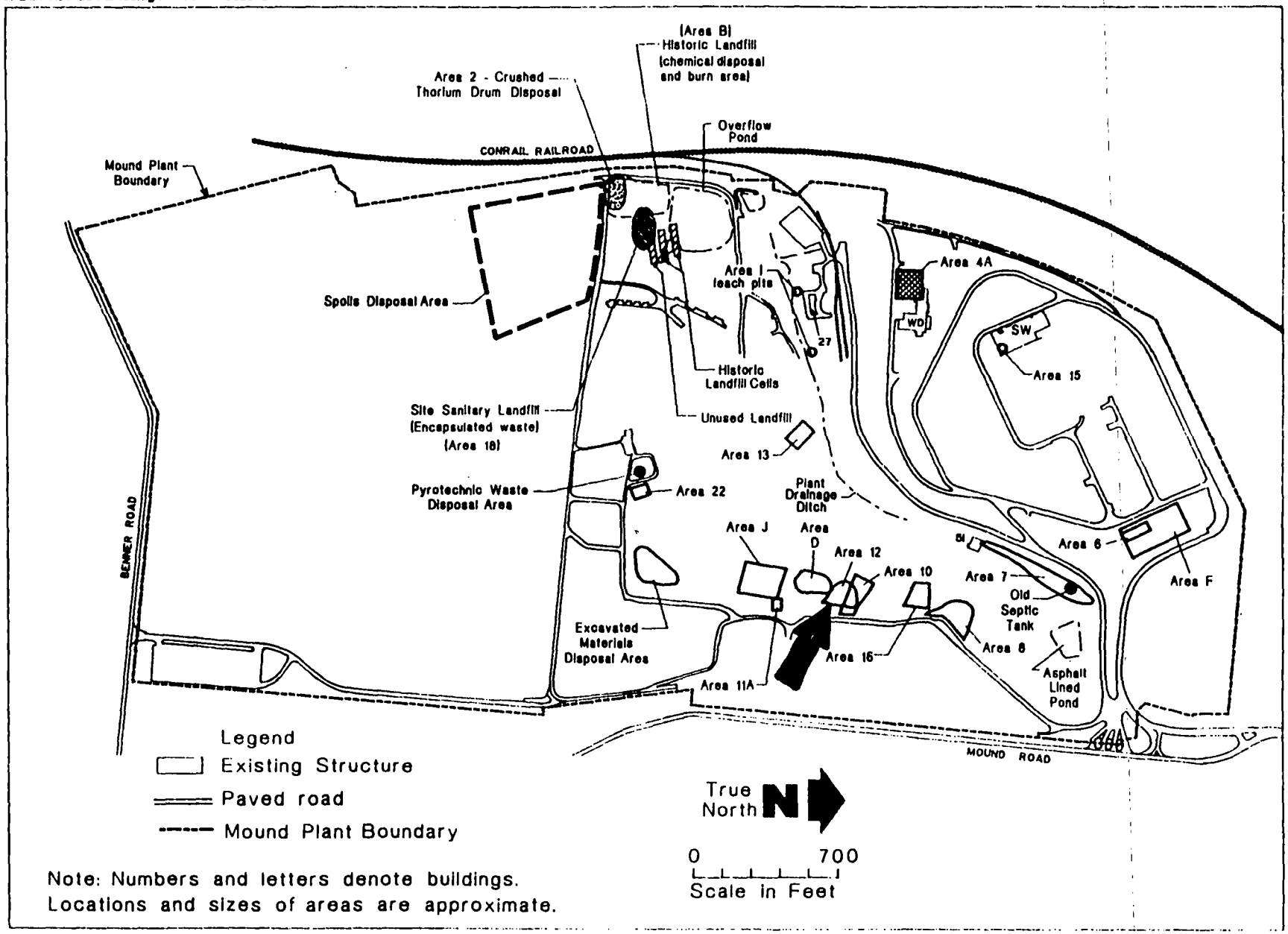


Figure 6.1 On-plant waste disposal areas.

~~Later versions of the map appeared in the waste management site plans of the mid-1970s (e.g., MRC 1974c)~~ with the correct thorium-232 isotope identified.

The contamination levels within Area 7, reported as a result of the Site Survey Project investigation, are plutonium-238 and thorium concentrations of 7.40 and 20.52 pCi/g, respectively, in surface samples (DOE 1991c). Other radionuclides detected included radium-226 (2 pCi/g), cesium-137 (1.2 pCi/g), and tritium (5.23 nCi/L).

6.1.1.4. Area 8, Thorium-Contaminated Soils from Areas 1 and 9 (Historical)

Area 8 is northwest of Building 31, on the SM/PP Hill in the eastern portion of Mound (Figure 6.1), and encompasses approximately 25,000 ft^2 (MRC 1985a). Area 9 and Area 1 were contaminated by the repackaging of the thorium-232 sludges in 1965 and 1966. When these areas were scraped to remove the surficial contamination (in 1965), the soils were disposed of in Area 8 and Area 12. During the 1982 to 1985 Radiological Site Survey (DOE 1991c), plutonium-238 was detected at a maximum concentration of 24.4 pCi/g in a surface sample; all other surface samples were less than 10 pCi/g. The maximum thorium concentration was 254.3 pCi/g in a subsurface sample at a depth of 80 inches.

6.1.1.5. Area 10, Debris from Dayton Units (Historical)

Area 10 is west of Building 30, on the slope of the SM/PP Hill, in the east-central portion of Mound (Figure 6.1) (DOE 1991c). It was used for the disposal of concrete contaminated with polonium-210 from the Dayton operations. The concrete was deposited in 1950 and, because of the short half-life of polonium-210 (138.4 days), is no longer radioactive (DOE 1992g). One hundred and sixty truckloads of debris were brought to Mound from Dayton Unit IV (Halbach 1950), and 100 truckloads were brought from Unit III. It is unknown how much of this was stored in Warehouse 10, the tropical huts, or dumped in Area 10. Many of the temporary buildings at Unit III were also razed and brought to Mound when that facility was decommissioned. Some more recent concrete disposal may also have occurred, but nothing is known for certain. The area is estimated to be approximately 150 ft by 100 ft. The single surface soil sample collected from Area 10 during the 1982 to 1985 Radiological Site Survey had a plutonium-238 concentration of 11.8 pCi/g and a thorium concentration of less than 2 pCi/g (DOE 1991c).

6.1.1.6. Area 12, Thorium-Contaminated Soil from Area 1

Area 12 is west of Building 38, on the SM/PP Hill, in the eastern portion of Mound (Figure 6.1) (DOE 1991c). In 1965, soil contaminated with thorium-232 was transferred to Area 12 from Area 1, when

the latter was scraped to remove the surface contamination. Soil contaminated with thorium-232 and plutonium-238 from the SM Building was deposited over the area in 1965 (DOE 1992g). In addition, the pipelines that carried low- and high-risk radioactive wastes from Building 38 to the WD Building passed through this area and could be a source of contamination. The 1982 to 1985 Radiological Site Survey found maximum plutonium-238 and thorium concentrations of 313 pCi/g and 189.9 pCi/g, respectively, at a sample depth of 54 inches. The area encompasses approximately 19,000 ft^2 (MRC 1983). When the WTS pipeline was removed by the D&D Program, soil overburden containing low-level thorium contamination was removed to a site south of the area now called Rader's Hill.

~~6.1.1.7. Area 15, Entombed Old Cave (Historical)~~

Area 15 is room 219 (referred to as the old cave) in the SW Building, on the Main Hill, in the northern portion of Mound (Figure 6.1). The approximately 1,000-ft^2 room was a hot cell used for the processing of radium-226 and actinium-227 from 1952 to 1954. In 1955, the contaminated room and equipment underwent D&D. Most equipment was packaged and shipped offsite for burial. Larger items, including a crane, crane tracks, and the cell walls and shielding, were laid down on the floor and covered with several inches of concrete (Garner 1991). Three sumps were also entombed. These were filled with sand and covered with 3 inches of concrete in 1955 (Meyer 1955d). A construction drawing of the original foundation and drainage plan, depicting the sumps layout, is included in Appendix A. The entire east side of the original SW Building was entombed, including room 1-A where the cave was located and room 1-B where the waste treatment evaporator was located. Two feet of sand were laid down room 1-A in 1959 and covered with concrete (Meyer 1959a).

Because this area was sealed, no radiological samples were collected from the equipment or concrete during the 1982 to 1985 Site Survey Project (DOE 1991c). Currently, a stack from the room is monitored by Mound and releases about 1 Ci of radon-222 per year. Radon-222 is a decay product of the residual radium-226. Residual radium-226 and actinium-227 may lie beneath the old cave room in a wastewater sump, which is known to have leaked contaminants into the area west of the sump, that drained the hot side of the cell. Concrete, soil, and gravel removed in 1955 were disposed of in an old septic tank in Area 7.

6.1.1.8. Area 16, SM Building Sanitary Sewage Septic Tank and Leach Basin (Historical)

Area 16 is below Building 30, on the west side of SM/PP Hill (Figure 6.1). The area covers approximately 15,500 ft^2 (MRC 1983). The SM Building was built in 1960 and served as the nuclear processing facility for plutonium-238 until 1967. The SM Building septic tank and leach basin were ~~used from 1960 to 1963 or 1964 until the building was connected to the si~~

Document Control No. _____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

June 1993

FINAL

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

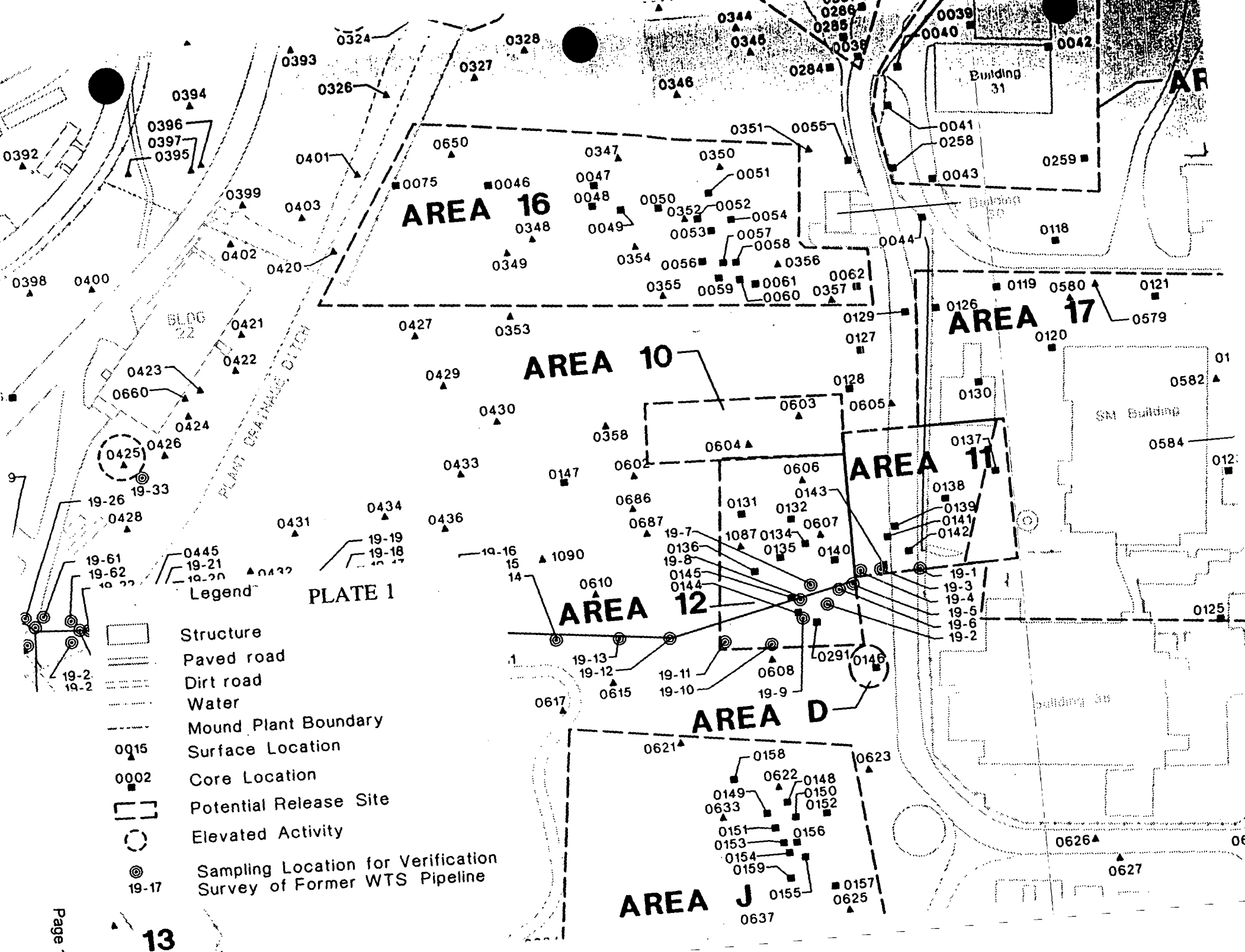

AREA 16
AREA 17
AREA 10
AREA 11
AREA 12
AREA D
AREA J
Building 31
SM Building
BLDG 22
PLANT DRAINAGE DITCH
Legend
Structure
Paved road
Dirt road
Water
Mound Plant Boundary
0015 Surface Location
0002 Core Location
Potential Release Site
Elevated Activity
19-17 Sampling Location for Verification Survey of Former WTS Pipeline

PLATE 1

~~survey data conducted during the preparation of this report, and appears to be relatively comparable~~ to the summaries presented in the original Site Survey Project Report. The original report did note that post site survey D&D Program core sampling was conducted in this area. Thorium concentrations as high as 150 pCi/g were detected, but thorium concentrations were generally in the range of 5 to 15 pCi/g. No data reports of the D&D Program were found during research for this report.

Mound Plant drawing #FSE16472 (DOE 1992f) indicates the depth to bedrock in this area is approximately 48 to 96 inches (4 to 8 ft). The maximum depth sampled during the Site Survey Project was 54 inches, or 4.5 ft. Most of the core locations were sampled at depths of 18 to 36 inches. Because the boring logs for Area 9 are not available, it is not known if sampling was performed until ~~bedrock was reached.~~

5.8. AREA 12

Area 12 is located on the SM/PP Hill, adjacent to Areas 10 and 11 (Plate 1). In 1965, thorium-contaminated soils from Area 1 were buried in a trench in Area 12. Pipelines that carried radioactive wastes from the PP Building to the WD Building passed through this area. This area contains elevated levels of plutonium-238, perhaps from work performed at the WTS (Area 19) or runoff from Area 11 (subsections 4.1.2 and 4.1.7). Another smaller area of plutonium-238 contamination was located west and downgradient of Area 12. This contamination may also be the result of surface water transport from Areas 11 and 12. The boundaries of Area 12 shown on Plate 1 are based on a review of the site survey data during preparation of this report, and are similar to the area depicted in the original Site Survey Project Report.

Table V.5 gives the results of the Site Survey Project sampling in Area 12, which are similar to the results summarized in the original Site Survey Project Report. The maximum plutonium-238 and thorium concentrations reported were 313 pCi/g and 189.9 pCi/g, respectively. These concentrations were detected in a sample collected from core location 0131 at a depth of 54 inches (Plate 1; C0131 on Table V.5).

In situ gamma spectroscopy for thorium-232 was performed at two core locations (CO145 and CO291, Table V.5). The maximum thorium-232 concentration measured using this technique was 22 pCi/g. This concentration was detected in the samples collected from location CO145 at depths of 24 and 36 inches. Most core locations were sampled to a total depth of 132 to 180 inches; however, the maximum sampling depth was 234 inches (Table V.5). Mound Plant drawing #FSE16472 (DOE 1992f) indicates the depth to bedrock in this area is 120 to 234 inches. It appears that the Area 12 core locations may have been sampled until bedrock was reached, but the boring logs are not available.

Table V.5. Mound Site Survey Project - Area 12

Plate 1 Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Plutonium-238 (pCi/g)	Thorium[b] (pCi/g)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)
C0131	2800	2500	1198	12-82	18	82.60	76.90				
			1199	12-82	36	NR	174.80				
			1200	12-82	54	313.00	189.90				
			1201	12-82	72	68.10	37.90				
			1202	12-82	90	0.03	b				
			1203	12-82	108	0.03	b				
			1204	12-82	144	0.03	b				
			1205	12-82	192	0.09	6.72				
			1206	12-82	222	0.14	b				
C0132	2825	2465	6785	08-84	0	12.10	4.24	LDL	LDL	1.1	LDL
			1185	12-82	18	11.13	b				
			1186	12-82	36	0.57	b				
			1187	12-82	72	0.58	b				
			1188	12-82	90	0.13	b				
C0134	2850	2465	1533	04-83	18	7.26	b				
			1534	04-83	36	3.39	b				
			1535	04-83	54	0.15	b				
			1536	04-83	72	NR	157				
			1538	04-83	108	3.99	2.93				
			1539	04-83	126	24.00	b				
			1540	04-83	135	29.40	b				
C0135	2850	2490	1541	04-83	18	17.10	b				
			1542	04-83	36	0.96	b				
			1543	04-83	54	0.73	b				
			1544	04-83	72	0.19	b				
			1545	04-83	90	0.25	b				
			1546	04-83	108	0.28	b				
			1547	04-83	126	0.15	b				
			1548	04-83	144	0.41	b				
			1549	04-83	153	0.08	b				

GAMMA SPECTROSCOPY

RADIOCHEMICAL ANALYSIS

[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.
[c]A "none" for MRC ID indicates that *in situ* gamma spectrocopy was performed for thorium-232. The report on this procedure is provided in Appendix C.

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

NR - No result given

pCi/g - picocuries per gram

pCi/mL - picocuries per milliliter

Table V.5. (page 2 of 3)

RADIOCHEMICAL ANALYSIS

GAMMA SPECTROSCOPY

Plate 1 Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Plutonium-238 (pCi/g)	Thorium[b] (pCi/g)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)
C0136	2850	2515	1511	04-83	18	32.90	b				
			1512	04-83	36	12.30	b				
			1513	04-83	54	1.95	b				
			1514	04-83	72	8.88	b				
			1515	04-83	90	4.50	b				
			1517	04-83	108	3.37	b				
			1518	04-83	126	7.72	b				
			1519	04-83	144	1.74	b				
			1520	04-83	162	0.55	b				
			1521	04-83	180	5.66	2.16				
C0140	2875	2450	1522	04-83	18	0.67	b				
			1523	04-83	36	0.17	b				
			1524	04-83	54	0.11	b				
			1525	04-83	72	0.64	b				
			1526	04-83	90	0.39	b				
			1527	04-83	108	0.48	b				
			1528	04-83	126	0.50	b				
			1529	04-83	162	0.15	b				
			1530	04-83	198	0.41	b				
			1531	04-83	216	0.05	b				
			1532	04-83	234	0.04	b				
C0144	2900	2500	1189	12-82	18	7.41	b				
			1190	12-82	36	164.80	25.70				
			1191	12-82	54	5.30	18.30				
			1192	12-82	72	1.30	b				
			1193	12-82	90	0.23	b				
			1194	12-82	108	0.07	b				
			1195	12-82	126	0.02	b				
			1196	12-82	144	0.04	b				
			1197	12-82	162	0.02	b				
C0145	2885.7	2498.9	None	02-84	0	NR	1.4				
			None	02-84	1	NR	1.4				
			None	02-84	24	NR	22				
			None	02-84	36	NR	22				
			None	02-84	48	NR	9.4				
			None	02-84	60	NR	14				
			None	02-84	72	NR	12				
S1087	2825	2515	6788	08-84	0	2.63	9.79				
S0606	2800	2440	9551	06-85	0	NR	NR	LDL	LDL	0.8	LDL
S0607	2850	2450	6789	08-84	0	1.19	b				

Table V.5. (page 3 of 3)

Plate 1 Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Plutonium-238 (pCi/g)	Thorium[b] (pCi/g)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)
C0291	2915.3	2490.3	None	07-84	0	NR	0.6				
			None	07-84	12	NR	0.4				
			None	07-84	24	NR	0.5				
			None	07-84	36	NR	0.4				
			None	07-84	48	NR	0.4				
			None	07-84	60	NR	0.3				
			None	07-84	72	NR	0.5				
			None	07-84	84	NR	0.4				
			None	07-84	96	NR	0.7				
			None	07-84	108	NR	0.6				
			None	07-84	120	NR	0.3				
			None	07-84	132	NR	0.3				

Table XI.1. Maximum Radioactivity Concentrations in Soil Samples from Major Areas

Site	Plutonium-238 (pCi/g)	Thorium (pCi/g)	Tritium (pCi/mL)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)	Actinium-227 (pCi/g)	Bismuth-207 (pCi/g)	Bismuth-210m (pCi/g)
Area 1	34,000	924.2	1.67	LDL	0.6	1.1	LDL	--	--	--
Area 2	17.10	3.31	--	--	--	--	--	--	--	--
Area 3	1,335	63	--	--	--	--	--	--	--	--
Area 4/4a	355.00	<2	--	LDL	LDL	1.2	1.0	--	--	--
Area 5	0.35[b]	<2[b]	--	250	1.6	0.9	LDL	--	--	--
Area 6	--	--	--	LDL	LDL	0.9	LDL	--	--	--
Area 7	7.40[j]	20.52	5.23	LDL	1.2	2.0	LDL	1,400	--	--
Area 8	24.40	254.39	1.12	LDL	LDL	3.3	LDL	--	--	--
Area 9	8.15	150	--	--	--	--	--	--	--	--
Area 10	99	<2	--	--	--	--	--	--	--	--
Area 11	100,000	69	--	--	--	--	--	--	--	--
Area 12	313.00	169.90	--	LDL	LDL	1.1	LDL	--	--	--
Area 13	5.74	<2	--	--	--	--	--	--	--	--
Area 14	29[j]	2.24	--	LDL	LDL	1.2	LDL	--	--	--
Area 15[e]	--	--	--	--	--	--	--	--	--	--
[illegible]	[illegible]	[illegible]	0.35	LDL	LDL	1.2	LDL	--	--	--
[illegible]	0.98	<2	--	--	--	--	--	--	--	--
[illegible]	147	30.42	6.84	3.0	LDL	1.0	LDL	--	--	--
Spoils Disposal	8.30	<2	1.90	LDL	LDL	0.94	LDL	--	--	--

[a]The total thorium concentration was less than the background level of 2 pCi/g, using FIDLER screening; therefore, radiochemical analysis was not performed.
[b]Most of the results for this radionuclide for this area are reported as NR. See the area-specific tabulated results.
[c]Area 15 emits 1 Ci per year of radon, indicating the presence of radium-226.
[d]Sampling of Area 19 was verification sampling conducted after remedial action.
[e]SW Building soils were sampled in 1977 (Dames and Moore 1977).
[f]Current remedial action guidelines are subject to change, pending additional pathways analysis and risk assessment.
[g]Current D&D cleanup level is 100 pCi/g (DOE 1983); 25 pCi/g, if feasible (as low as reasonably achievable [ALARA]).
[h]remedial action guideline (CFR 1990)
[i]remedial action guideline (DOE 1983)
[j]value for Area 7 does not include value at Building 66
[k]value indicated is thorium-230 isotope
[l]value is mean during verification sampling after cleanup
[m]highest residual level after verification cleanup
-- Dashes indicate that no data are available for the given area and given radionuclide.
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 and actinium-227.
NE - Not established
NR - No result
pCi/g - picocuries per gram
pCi/mL - picocuries per milliliter
Ci - curie

PRELIMINARY REVIEW/VISUAL SITE INSPECTION FOR RCRA FACILITY OF MOUND PLANT

JULY 1988

Other Areas of Concern (continued)

Name	Contaminant	Location	Volume/Area	Cause	Reference
SM/PP Hill-6	Dirt containing thorium and plutonium	West of SM Building	19,000 ft^2	Dumping area	81
Valley-4 Area	Polonium-contaminated concrete	Northeast of Building 49	9,000 ft^2	Dumping area	81
SM/PP Hill-7	Soil contaminated with cobalt-60	Unknown	9,000 ft^2	Dumping area	81
SW Building	Tritium	Releases from beneath the building	Unknown	Leaks	13
HH Building	Tritium	Releases from beneath the building	Unknown	Leaks	13
North Pond	Plutonium-contaminated runoff	East of north end of North Canal	Unknown	Spill	7
nd	Plutonium-contaminated runoff	East of north end of North Canal	Unknown	Spill	7

Document Control No._____

Environmental Restoration Program

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

MOUND PLANT
MIAMISBURG, OHIO

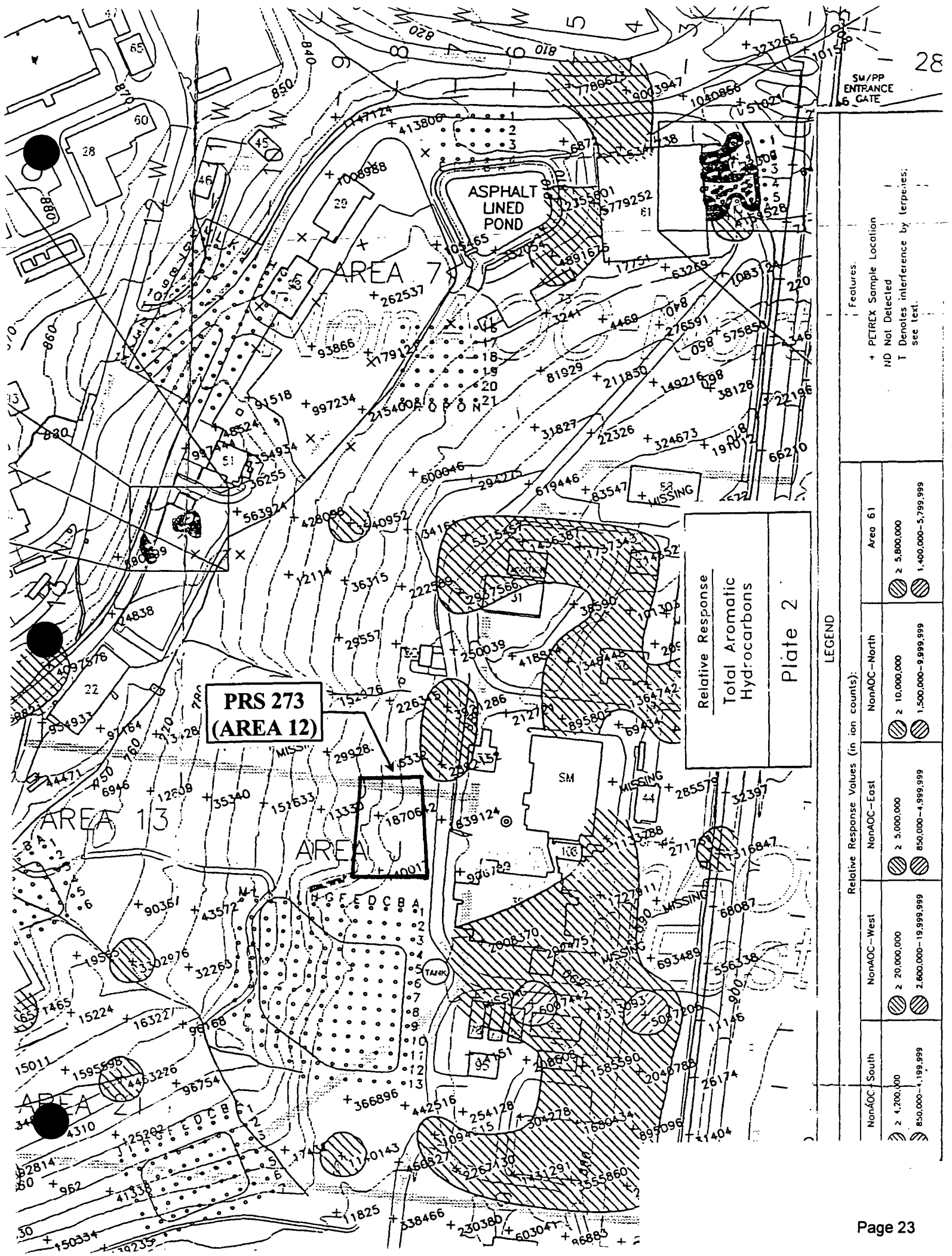
VOLUME II - APPENDICES A-G

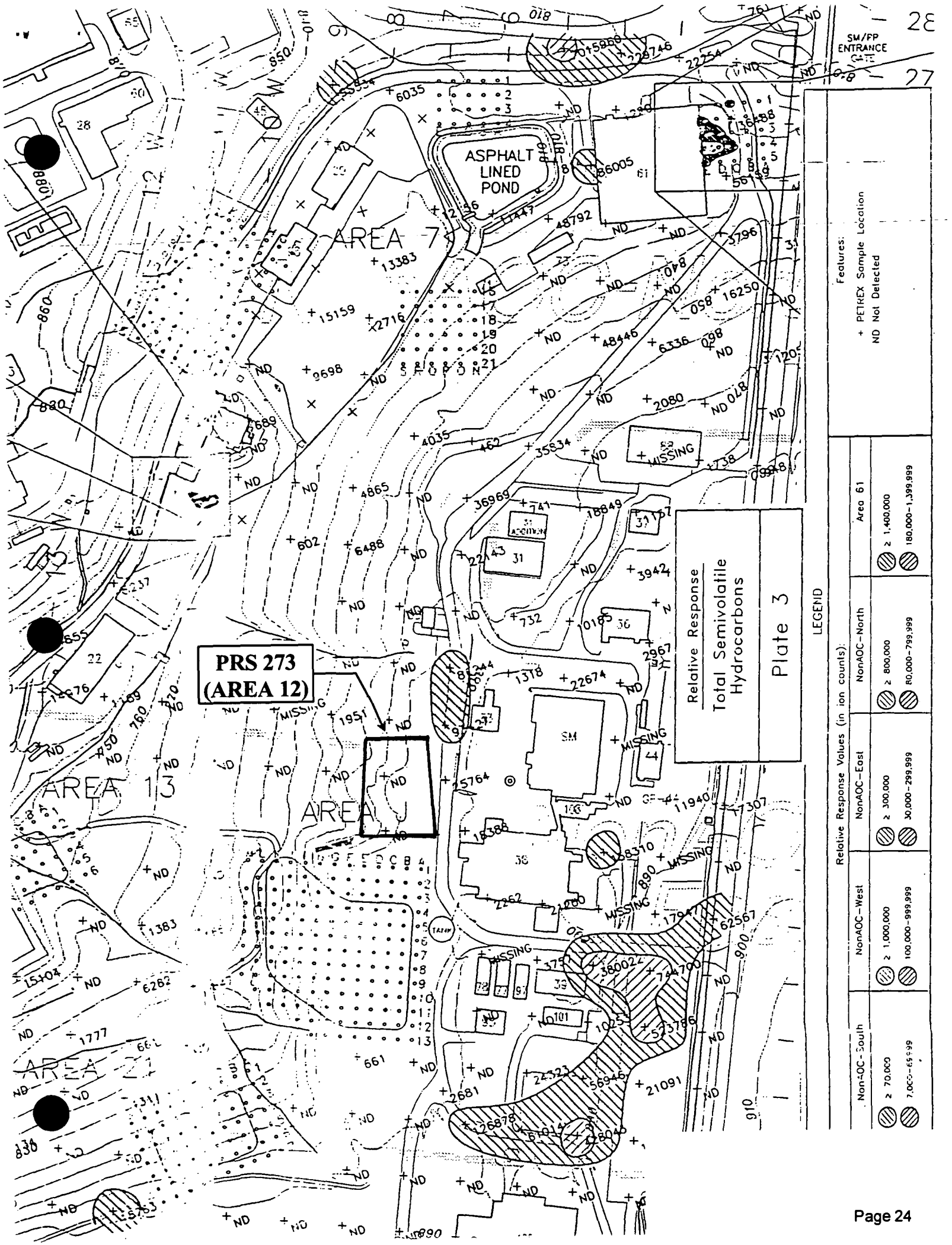
June 1995

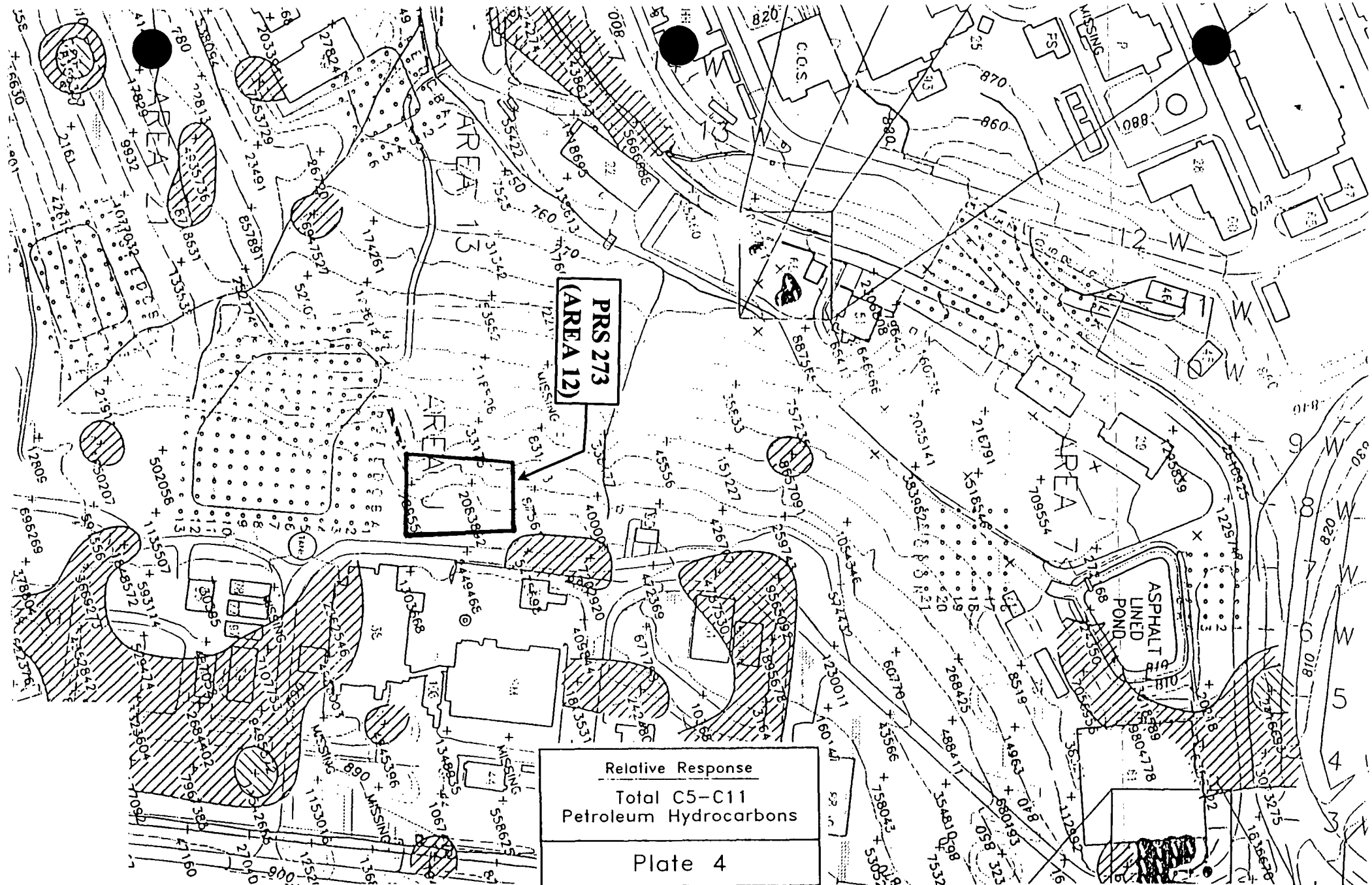
Final (Revision 0)

U.S. Department of Energy
Ohio Field Office

G&G Mound Applied Technologies


ASPHALT LINED POND
AREA 7
AREA 13
AREA 21
PRS 273 (AREA 12)
SM/PP ENTRANCE GATE
SM
TANK
MISSING
Relative Response
Total Aromatic Hydrocarbons
Plate 2
LEGEND
Features:
+ PETREX Sample Location
ND Not Detected
T Denotes interference by terpenes; see text.
Relative Response Values (in ion counts):
NonAOC-South
≥ 4,200,000
850,000-4,199,999
NonAOC-West
≥ 20,000,000
2,600,000-19,999,999
NonAOC-East
≥ 5,000,000
850,000-4,999,999
NonAOC-North
≥ 10,000,000
1,500,000-9,999,999
Area 61
≥ 5,800,000
1,400,000-5,799,999


PRS 273
(AREA 12)
ASPHALT
LINED
POND
AREA 7
AREA 13
AREA 11
AREA 21
SM/FP
ENTRANCE
Relative Response
Total Semivolatile
Hydrocarbons
Plate 3
LEGEND
Features:
+ PETREX Sample Location
ND Not Detected
Relative Response Values (in ion counts):
Area 61
≥ 1,400,000
180,000–1,399,999
NonAOC–North
≥ 800,000
80,000–799,999
NonAOC–East
≥ 300,000
30,000–299,999
NonAOC–West
≥ 1,000,000
100,000–999,999
NonAOC–South
≥ 70,000
7,000–69,999



LEGEND

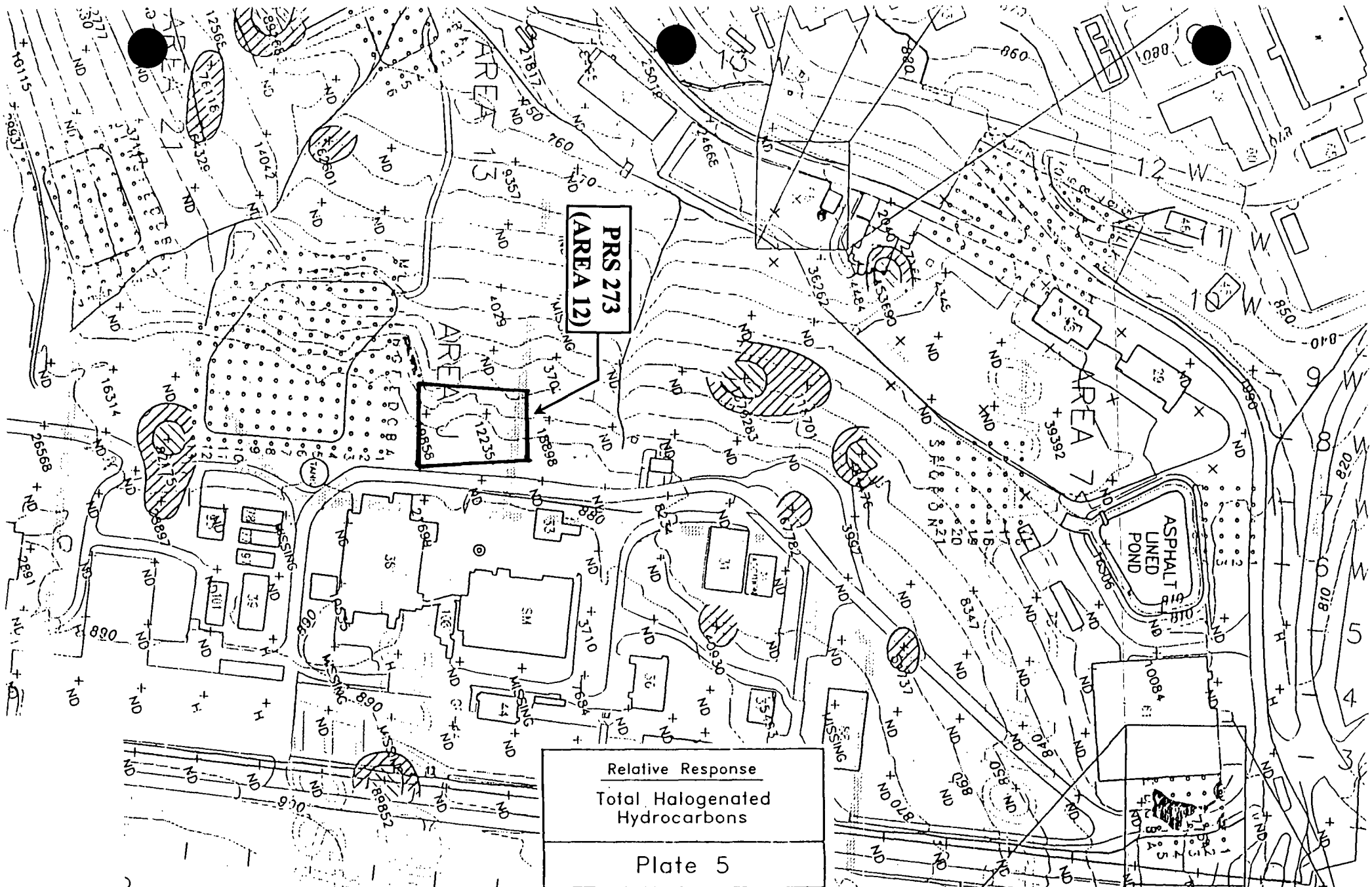
Relative Response Values (in ion counts):

NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61
≥ 8,000,000	≥ 29,000,000	≥ 11,500,000	≥ 23,000,000	≥ 25,000,000
1,500,000-7,999,999	3,000,000-28,999,999	1,600,000-11,499,999	4,000,000-22,999,999	3,000,000-24,999,999

Features:

+ PETREX Sample Location

T Denotes interference by terpenes; see text.



Relative Response

Total Halogenated Hydrocarbons

Plate 5

LEGEND

Relative Response Values (in ion counts):					Features:
NonAOC-South	NonAOC-West	NonAOC-East	NonAOC-North	Area 61	+ PETREX Sample Location
≥ 500,000	≥ 500,000	≥ 80,000	≥ 400,000	≥ 250,000	ND Not Detected
50,000-499,999	50,000-499,999	20,000-79,999	40,000-399,999	35,000-249,999	H Denotes interference by petroleum hydrocarbons; see text.

EG&G MOUND-14-04----9508020020

W.P. DAVIS

MLM-3517

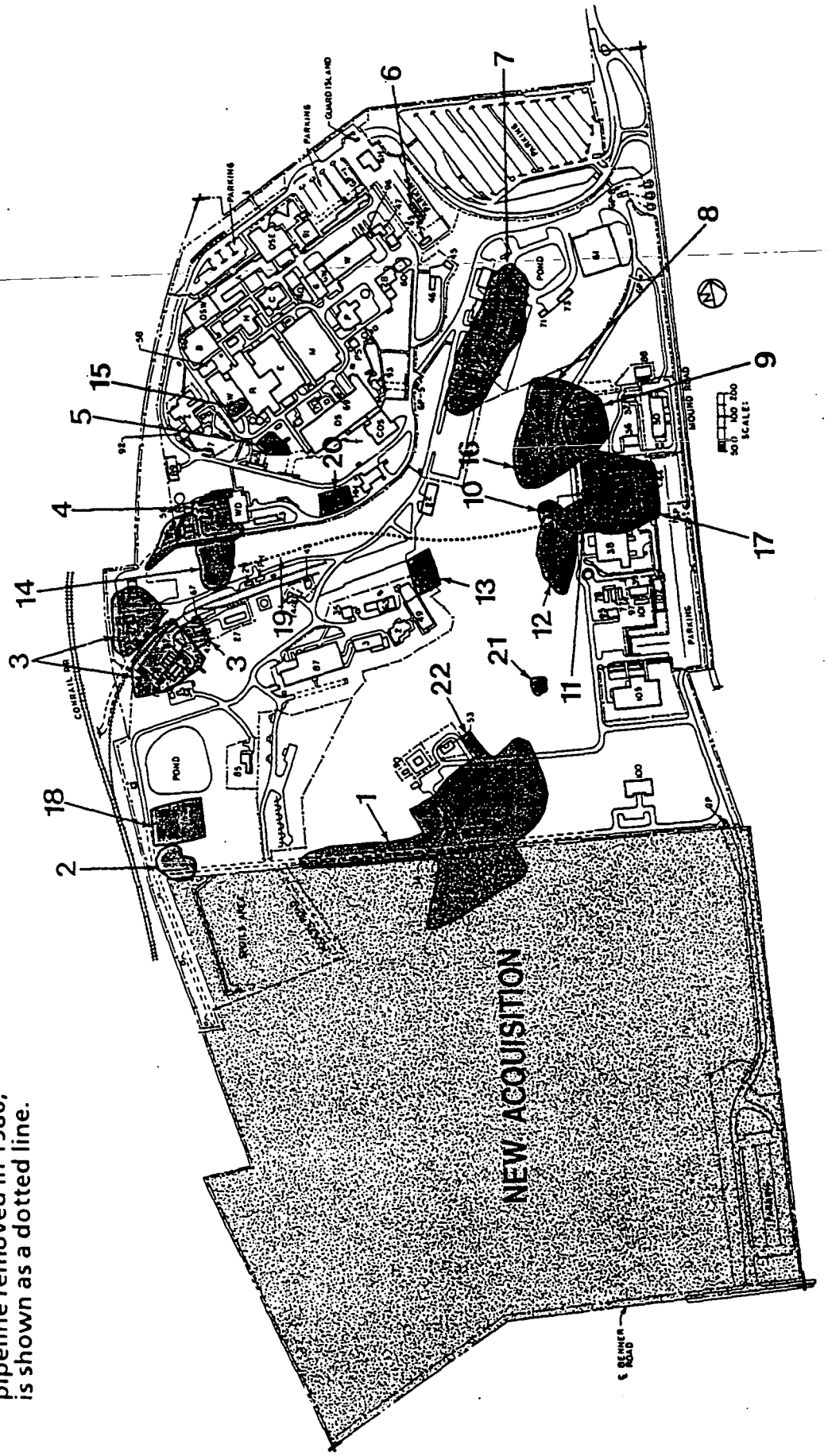
The Mound Site Survey Project for the Characterization of Radioactive Materials in Site Soils

Robert L. Stought, Don A. Edling, and Douglas G. Draper

May 16, 1988

MOUND
Miamisburg, Ohio 45342
operated by
MONSANTO RESEARCH CORPORATION
a subsidiary of Monsanto Company
for the
U.S. DEPARTMENT OF ENERGY
Contract No. DE-AC04-76-DP00053

Monsanto



Area 19, an underground pipeline removed in 1986, is shown as a dotted line.

Figure 1.1 - Site map showing the acquired land and the location of the 22 areas discussed in this document.

2.2 Locations of Known Contamination

As a result of Mound's Environmental Monitoring Program, 19 sites were previously known to have varying levels of contamination resulting from operations and programs conducted at Mound. These are shown in Figure 2.1 and described in Table 2.1. As detailed surveys were conducted, three of the original areas (No. 6, 10, and 13) were determined to have no detectable contamination. However, three additional areas (No. 20, 21, and 22) were detected. Figure 2.2 shows the three new areas and shows the expansion of Area No. 1 based on the more extensive surveys.

Core sampling was the primary means used to characterize these 19 existing locations. The extent of coring varied at various locations. From Areas 1, 4, 5, 7, 8 and 12, hundreds of depth specific data points were obtained from the core samples. In comparison, only a few core samples were required at Areas 6 and 13 to verify that contamination no longer existed at these locations. Core samples were not obtained at Area 15, which is inside the SW-Building, and at Area 19, since those types of surveys have been performed as part of decontamination and decommissioning operations. At Area 8 and a portion of Area 1, where thorium contamination is prevalent, portable gamma spectroscopy was used to determine subsurface soil contamination in lieu of collecting core samples.

The results of this detailed characterization of the 19 previously identified sites are summarized below:

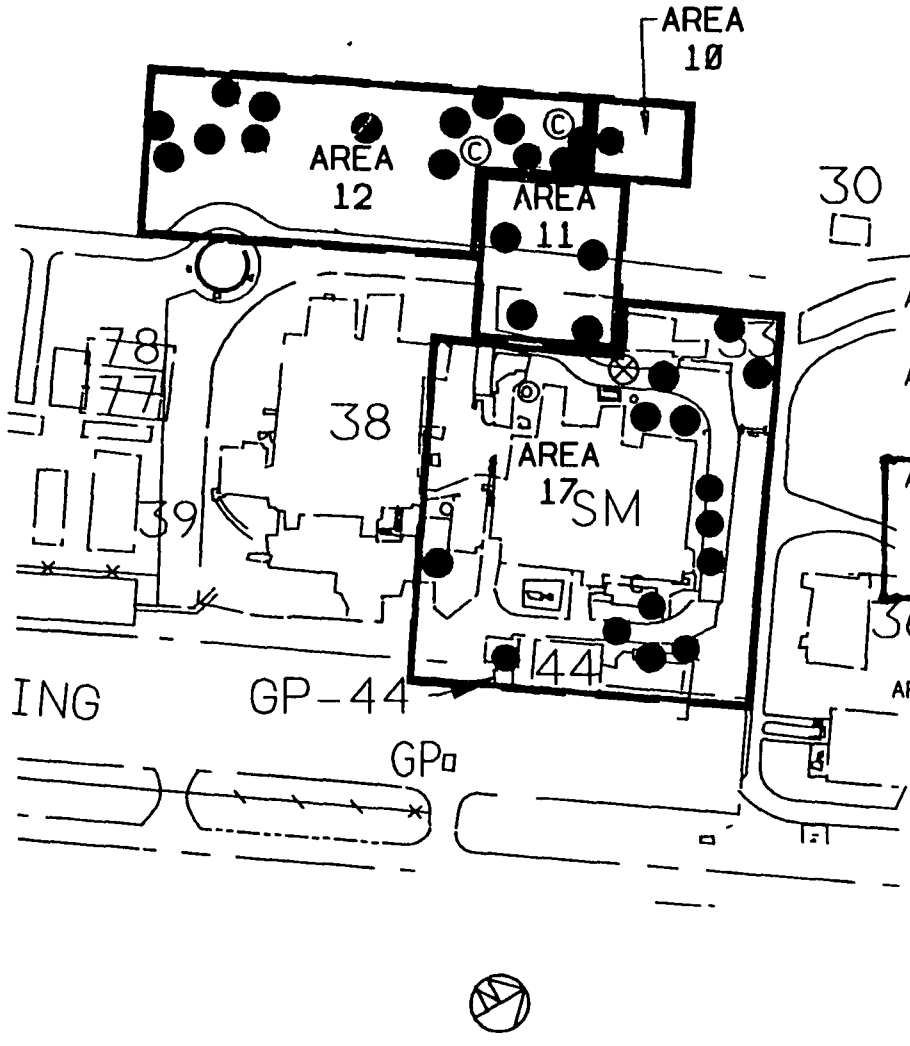
Verified Existing Contamination	Results Demonstrated No Contamination
1,2,3,4	
5,7,8,9	6,10,13
11,12,14	
15,16,17,18,19	

Table 2.1 (continued)

Area	Isotopes	Description
10	^{210}Po Residuals ^{238}Pu	1950 - Contaminated concrete from Unit 4 Dayton operations. (Polonium contamination has decayed out.) - More recent D&D surface soil sample data indicate one sample in the range of 10 to 99 pCi/g.
11	^{238}Pu	Prior to 1965. Contaminated from SM-Building operations. - Areas No. 11 & 17 - More recent D&D data (Pu-238 core samples) indicate Pu-238 contamination in the range of 10 to 100 nCi/g.
12	Thorium ^{238}Pu	1965 - Contaminated dirt from Area 1. Pu-238 contamination from SM-Building operations.
13	^{210}Po Residuals	1950 - Contaminated wood from Unit 4 Dayton operations located there. (Polonium contamination has decayed out.)
14	^{238}Pu	1969 - Radioactive waste line from SM-Building to WD-Building broke. Highly contaminated soil (964 ft^3) removed and shipped to NECO for burial. Area backfilled with clean soil. In August 1974, action to remove all hillside surface soil containing significant levels of contamination was started. Approximately 2,700 ft^3 of soil were removed containing an estimated 35 Curies. The area was backfilled and sodded with clean dirt. The soil was shipped to Idaho for retrievable storage. It was in this area where the soil sample with contamination levels of 3500 nCi/g was found as part of D&D operations.

Table 3.1 (Continued)

Area Number	Radio-nuclide	Bkg	≥0.01 pCi/g	≥0.1 pCi/g	≥1.0 pCi/g	≥2.0 pCi/g	≥10.0 pCi/g	≥100 pCi/g	≥1000 pCi/g	
8	Pu-238	-	6	10	16	--	3	--	--	
	Th	19	--	--	--	20	69	4	--	
	H-3	-	--	--	2	--	--	--	--	
	Ra	-	--	--	2	--	--	--	--	
9	Pu-238	-	4	14	3	--	--	--	--	
	Th	17	--	--	--	2	1	--	--	
10	None Detected									
11	Pu-238	-	2	10	7	--	1	2	--	
	Th	15	--	--	--	6	--	--	--	
12	Pu-238	-	18	51	47	--	16	2	--	
	Th	118	--	--	--	14	9	3	--	
	H-3	-	--	--	1	--	--	--	--	
	Co	-	--	--	1	--	--	--	--	
	Ra	-	--	1	1	--	--	--	--	
13	None Detected									
14	Pu-238	-	1	7	15	--	7	1	--	--
	Th	29	--	--	--	1	--	--	--	--
16	Pu-238	-	5	24	20	--	8	1	--	--
	Th	55	--	--	--	3	--	--	--	--
	Ra	-	--	1	1	--	--	--	--	--



AREA Nos. 10, 11, 12 & 17

SUSPECTED ISOTOPES: Polonium-210, Plutonium-238, Thorium, Actinium-227

VERIFIED ISOTOPES: Plutonium-238, Thorium,

AREA 10 -	Pu-238,	1 surface sample 10 - 99 pCi/g (red)
	Po-210,	none detected
AREA 11 -	Pu-238,	3 core samples 10 - 99 pCi/g (red)
		1 core sample 100 - 999 pCi/g
AREA 12 -	Pu-238,	9 core samples 10 - 99 pCi/g (red)
		2 core sample 100 - 999 pCi/g
		3 surface samples 10 - 99 pCi/g
	Thorium,	© 2 core samples 100 - 999 pCi/g (yellow)
AREA 17	Pu-238,	1 core sample 100 - 999 pCi/g (red)
		6 core sample 10 - 99 pCi/g
		3 surface samples 100 - 999 pCi/g
		4 surface samples 10 - 99 pCi/g
	Thorium,	© 1 core sample 100 - 999 pCi/g (yellow)
		C 1 surface sample 100 - 999 pCi/g

Figure 4.9 - Area No. 10, 11, 12, and 17 - An expanded view.

RISK-BASED GUIDELINE VALUES

MOUND PLANT
MIAMISBURG, OHIO

December 1995

Submitted to the
Office of Southwestern Area Programs (EM-453)
Environmental Restoration
and the
Miamisburg Area Office
U.S. DEPARTMENT OF ENERGY

Prepared by
HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
Environmental Management and Enrichment Facilities
Managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

FINAL
(REVISION 3)

TABLE 4A

Construction/Mound Employee - Soil/Sediment Guideline Values: Chemicals (Units = mg/kg)

CHEMICAL	Ingestion				Inhalation				Ingestion + Inhalation			
	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1
Cyanide				2.15e+04								
Iron												
Lead												
Lithium												
Manganese (Diet)				1.50e+05				1.55e+06				1.35e+05
Mercury				3.20e+02				9.50e+06				3.20e+02
Nickel				2.15e+04								
Silver				5.50e+03								
Thallium												
Vanadium				7.50e+03								
Zinc				3.20e+05								
Organics												
1,1,1-Trichloroethane												
1,1-Dichloroethane				1.05e+05				3.90e+01				3.90e+01
1,2-Dichloroethane	3.30e+03	3.30e+02	3.30e+01		1.70e+03	1.70e+02	1.70e+01		1.10e+03	1.10e+02	1.10e+01	

TABLE 4A

Construction/Mound Employee - Soil/Sediment Guideline Values: Chemicals (Units = mg/kg)

CHEMICAL	Ingestion				Inhalation				Ingestion + Inhalation			
	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1	GV for TR=10^{-4}	GV for TR=10^{-5}	GV for TR=10^{-6}	GV for HI=1
High Explosives												
HMX				5.50e+04								
PETN												
RDX	2.70e+03	2.70e+02	2.70e+01	3.20e+03								
Inorganics												
Aluminum												
Antimony				4.25e+02								
Arsenic				3.20e+02	6.00e+05	6.00e+04	6.00e+03					
Barium				7.50e+04				1.55e+07				7.50e+04
Beryllium	7.00e+01	7.00e+00	7.00e-01	5.50e+03	3.65e+06	3.65e+05	3.65e+04		7.00e+01	7.00e+00	7.00e-01	
Cadmium (Diet)				1.05e+03	5.00e+06	5.00e+05	5.00e+04					
Chromium III				1.05e+06								
Chromium VI				5.50e+03	7.50e+05	7.50e+04	7.50e+03					
Cobalt												
Copper												

DRAFT
OTHER SOILS CHARACTERIZATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

JANUARY 1996

U.S. DEPARTMENT OF ENERGY
OHIO FIELD OFFICE

DECONTAMINATION AND DECOMMISSIONING PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

Area 9

Of the 160 locations projected for Area 9 sampling, 106 locations were sampled and screened. The remainder were eliminated due to the presence of utilities or other physical constraints (curbing and fencing).

Area 10

PRS 273

Of the 28 locations projected for Area 10 sampling, 4 were eliminated due to physical constraints (massive concrete slabs or steep slopes of a narrow ravine). Prior to sampling, the services of a local contractor were required to remove brush, small trees, dead wood and branches. All of Area 10 and access to the area required clearing in order to mobilize sampling equipment into the area.

Area 12

Of the 70 locations projected for Area 12 sampling, 23 were eliminated due to the presence of overhead high voltage power lines and underground utilities.

A majority of the Area 12 samples were collected by the field team while wearing Level C respiratory protection. Level of protection and required personnel protective equipment were defined in the RWP and outlined in the site HASP.

Field instruments indicated elevated radiological activity in the soil along the west boundary of the area. After consultation with the Mound Project Engineer, additional sampling was conducted west of the original area boundary.

Prior to sampling, the services of Mound's heavy equipment operators were required to remove brush, small trees, dead wood and branches from the locations to be sampled. A total of 22 additional borings were required in order to define the lateral extent of radiological contamination in this area.

Area 20

Of the 50 locations projected for Area 20 sampling, 37 locations were sampled and screened. The remainder were eliminated due to the presence of a bank of underground high voltage power lines, other underground utilities or other physical constraints (guardrail and ditch).

Area 23

Of the 70 locations projected for Area 23 sampling, 27 locations were sampled and screened. The remainder were eliminated due to the presence of overhead power lines, underground utilities or other physical constraints (guardrail and ditch).

exceeding the action levels are tabulated below. These tables identify samples from of potential contamination. Graphic representations of the Other Soils areas and Hot Spots with a data overlay have been included to facilitate interpretation, and aid in the computation of soil cleanup volumes.

Where Mound Rad Lab method detection limits exceed specified action levels, a symbol indicating the undetermined nature of the data ("U") accompanies the spreadsheet entry.

Table 5.2 shows the action levels used in the Other Soils Field Program to identify potentially contaminated soil.

Table 5.2 Field Action Levels

Field Instruments	Action Level
FIDLER	
Channel 1 (Pu)	1000 cpm Above Background
Channel 2 (Th)	5000 cpm Above Background
OVA	1 Meter Unit Above Background
OVM	1 Meter Unit Above Background
PXRF	
Arsenic	102.07 mg/Kg
Barium	1489 mg/Kg
Cadmium	NA
Chromium (High)	NA
Chromium (Low)	164.43 mg/Kg
Lead	172 mg/Kg
Mercury	NA
Selenium	NA
Silver	2559 mg/Kg
Mound Rad Lab	
Plutonium 238	25 pCi/g
Thorium 232	5 pCi/g
Radium 226	5 pCi/g
Cesium 137	15 pCi/g *
Americium 241	20 pCi/g

* NRC Limit

The action level for Cesium 137 was reduced for this report from the D&D action level of 80 pCi/g to the NRC action level of 15 pCi/g. The basis for adjusting this limit can be found in a communication with the Nuclear Regulatory Commission (NRC) which discusses decommissioning criteria and maximum acceptable isotope concentrations in soil. A copy of the communiqué may be found in Appendix H.

Area 5

Thirteen samples in Area 5 triggered field screening action levels:

Area 12

Seventy-six samples in Area 12 triggered field screening action levels:

- Twelve samples exceeded limits for hazardous compounds
- Sixty samples exceeded limits for radionuclides
- Four samples exhibited elevated levels of both radiological and hazardous compounds

Organic vapors from soil samples peaked at 30 meter units on the OVA. Elevated concentrations of chromium and lead were detected by the PXRF. Pu238, Th232 and Ra226 were found in excess of D&D limits in soil samples collected from the site. Maximum concentrations detected were 301,212, and 30 pCi/g respectively.

Table 5.8 shows Area 12 field results exceeding action levels. Figure 5.7 graphically represents Area 12 field sampling results.

Area 20

Thirty-three samples in Area 20 triggered field screening action levels:

- Twenty-nine samples exceeded limits for hazardous compounds
- Four samples exceeded limits for radionuclides

Organic vapors from soil samples peaked at over 500 meter units on the OVA. Elevated concentrations of Pu238 were found at up to 38 pCi/g in soil samples collected from the site.

Table 5.9 shows Area 20 field results exceeding action levels. Figure 5.8 graphically represents Area 20 field sampling results.

Key to interpreting sample data:

Sample nomenclature is of the form **XXYY-ZZ00**

Where:
XX = Area designation

YY = Sample Location
- 01 = Historical Hot Spot Location
- 02 = Approx 10 feet north of historical location
- 03 = Approx 10 feet south of historical location
- 04 = Approx 10 feet west of historical location
- 05 = Approx 10 feet east of historical location

ZZ = Sample Type
- 50 = Soil

00 = Sample Depth
- 01 = Surface
- 04 = 0-4 feet
- 08 = 4-8 feet
- 12 = 8-12 feet

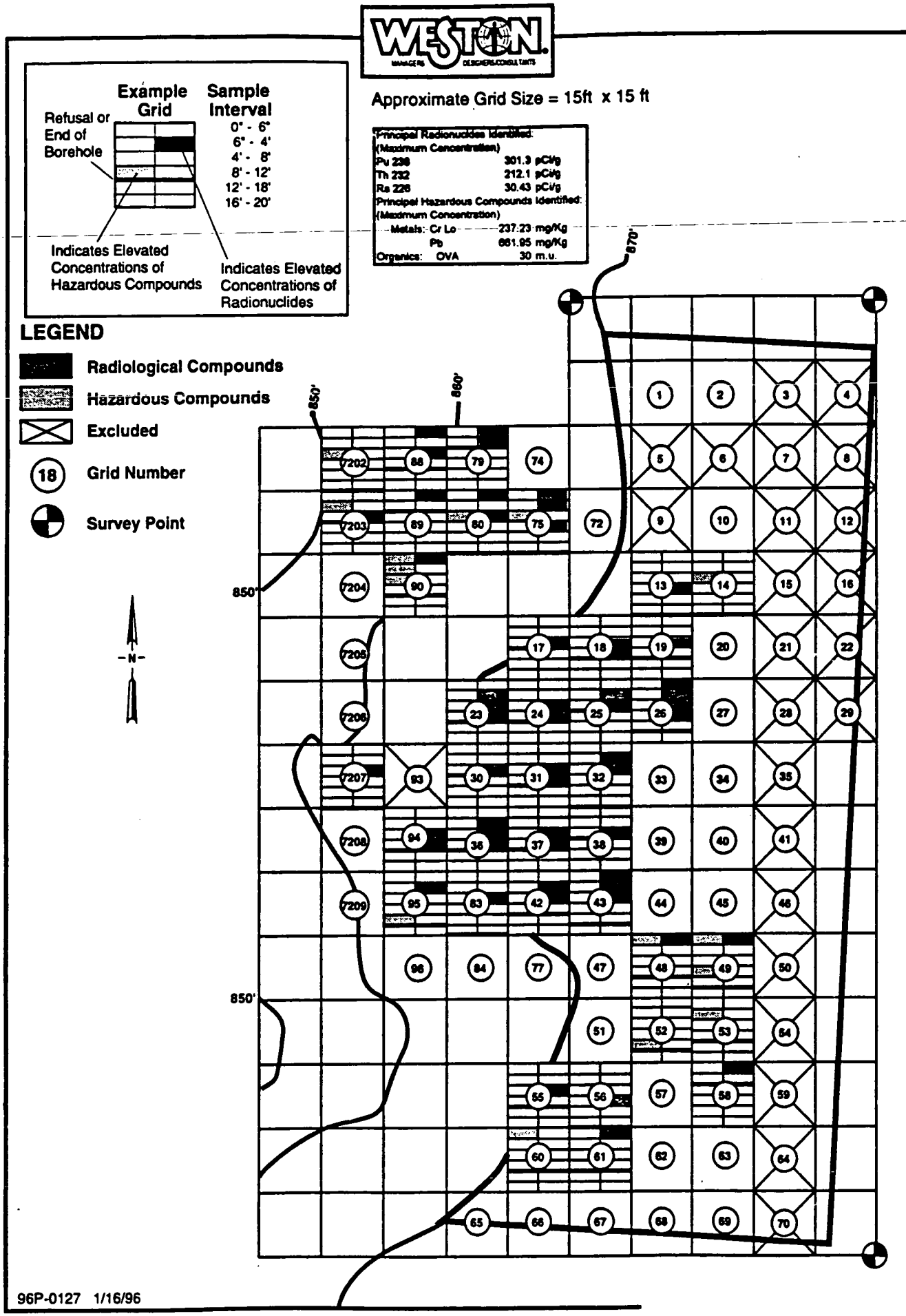


FIGURE 5.7 AREA 12

5.0 Results

This table lists only those samples whose reported concentrations exceeded the Other Soils field action levels.

Table 5.8 Area 12 Field Sampling Results

Sample ID	FIDLER Channel 1 (1K)	FIDLER Channel 2 (5K)	Organics OVA	Organics OVM	Rad Laboratory U 238 (25)	Rad Laboratory Th 232 (5)	Rad Laboratory Ra 226 (5)	Rad Laboratory Cs 137 (15)	Rad Laboratory Am 241(20)
1213-5012	<1000	12000 *	<1	NA	<440.2 U	33.55 *	<4.8	<0.15	<0.62
1214-5008	<1000	<5000	<1	NA	<155.9 U	1.35	<1.99	<0.07	<0.17
1217-5008	<1000	6000 *	<1	<1	<459.1 U	22.24 *	<4.43	0.37	<0.61
1218-5008	<1000	10000 *	<1	<1					
1218-5012	<1000	15000 *	<1	<1	<548.6 U	30.19 *	11.85 *	<0.28	<0.68
1219-5008	<1000	<5000	<1	NA	<335 U	6.9 *	<3.29	<0.19	<0.34
1223-5004	1000 *	33000 *	<1	<1	<168.1 U	1.09	<2.39	<0.14	<0.18
1223-5008	1350 *	53000 *	<1	<1	<980.9 U	193.3 *	17.69 *	<0.66	<1.51
1223-5012	<1000	18000 *	<1	<1	<1227 U	161.5 *	30.43 *	<0.65	2.1
1224-5008	<1000	30000 *	<1	<1	<555.3 U	61.87 *	14.81 *	<0.39	0.86
1224-5012	<1000	40000 *	<1	<1					
1225-0008					<583.7 U	104 *	13.8 *	<0.3	<0.7
1225-5004	<1000	<5000	<1	NA	<203.1 U	7.52 *	<3.28	0.18	<0.3
1225-5008	1000 *	70000 *	<1	NA	<1260 U	212.1 *	17.03 *	<0.73	<1.66
1226-5001	<1000	<5000	<1	NA	202.5 *	3.3	2.88	<0.16	<0.23
1226-5004	<1000	<5000	<1	NA	<253.2 U	6.94 *	<3.56	0.22	<0.33
1226-5008	<1000	<5000	<1	NA	<151.7 U	2.02 *	5.13 *	<0.08	<0.26
1230-5008	<1000	21000 *	<1	<1	<826.8 U	169.78 *	14.82 *	<0.4	<0.92
1231-5008	<1000	9000 *	NA	<1	<481.7 U	21.35 *	<5.85 U	<0.26	<0.58
1231-5012	<1000	34000 *	NA	<1	<1025 U	121.4 *	<12.68 U	<0.53	2.54
1232-5004	<1000	<5000	<1	NA	<270.4 U	5.85 *	5.53 *	0.14	<0.39
1232-5008 D					<295.8 U	12.65 *	4.09	<0.22	<0.43
1232-5008	<1000	<5000	<1	NA	<391.9 U	37.57 *	<5.86 U	<0.15	<0.84
1236-5004	<1000	5000 *	<1	<1	<142.9 U	2.69	<1.89	<0.17	<0.18
1236-5008	<1000	15000 *	<1	<1	<341.6 U	47.61 *	8.46 *	0.43	<0.66
1236-5012	<1000	7000 *	<1	<1					
1237-5008	<1000	19000 *	NA	<1	<275.3 U	3.94	<3.1	0.17	<0.27
1237-5012	<1000	35000 *	NA	<1	<899.1 U	185.8 *	<12.38 U	<0.59	<1.35
1238-5008	<1000	15000 *	<1	NA	<322.2 U	18.78 *	<4.8	<0.23	<0.68
1242-5004	<1000	8000 *	<1	<1	<374.7 U	26.39 *	8.76 *	<0.27	<0.54
1242-5008	<1000	23000 *	<1	<1	<568.4 U	46.27 *	<7.75 U	<0.31	<0.77
1243-5001	<1000	<5000	NA	NA	<352 U	14.42 *	<4.61	<0.2	<0.5
1243-5004	<1000	10000 *	NA	NA	<344.4 U	20.44 *	5.77 *	<0.24	<0.5
1243-5008	<1000	5000 *	NA	NA					
1248-5001	<1000	<5000	<1	NA	190 *	1.38	1.34	<0.02	<0.04
1249-5001	<1000	<5000	<1	NA	119.8 *	0.72	2.38	0.14	<0.18
1249-5008	<1000	<5000	<1	NA	<107.2 U	<0.37	2.67	0.14	<0.19
1252-5014	<1000	<5000	<1	NA	<136.2 U	0.64	<1.91	0.19	<0.16
1253-5004	<1000	<5000	10 *	NA	<124.8 U	1.47	3.11	<0.17	<0.17
1255-5008	<1000	<5000	<1	<1	103.8 *	0.57	<1.87	0.17	<0.17
1256-5012	<1000	<5000	<1	<1	102 *	0.69	1.79	0.2	<0.15
1258-5001	<1000	<5000	<1	NA	55.01 *	0.3	<1.46	<0.09	<0.12
1260-5001	<1000	<5000	2 *	<1	<99.55 U	0.33	<1.45	<0.09	<0.11
1261-5001	<1000	<5000	<1	<1	111.4 *	<0.38	<2.02	<0.1	<0.16
1275-5001	<1000	7000 *	<1	NA	<147.5 U	1.4	3.8	<0.08	<0.1
1275-5004 D					<222.9 U	13.1 *	3.9	0.1	<0.3
1275-5004	<1000	<5000	<1	NA	<91.7 U	14.8 *	1.5	0.12	<0.17
1275-5008	<1000	<5000	<1	NA	<42.1 U	1.1	2.4	0.07	<0.05
1275-5012	<1000	<5000	<1	NA	170.3 *	0.65	1.34	<0.02	<0.04
1279-5001	<1000	<5000	<1	NA	<69.3 U	7.1 *	0.8	0.4	<0.1
1279-5004	<1000	<5000	<1	NA	<62 U	5.9 *	2.4	0.2	<0.08
1280-5001	<1000	<5000	<1	NA	<207.4 U	11.3 *	<2.5	<0.1	<0.2
1280-5001 D					<90.4 U	10.4 *	1.4	0.1	<0.1
1280-5008 D					<187 U	9.8 *	4.7	<0.1	0.3
1280-5008 D					<76 U	10 *	2.3	0.14	<0.1
1280-5008 D					<78.4 U	11.1 *	2	0.09	<0.1
1280-5008	<1000	<5000	<1	NA	<191.3 U	11.5 *	2.9	<0.1	<0.3
1280-5008	<1000	<5000	<1	NA	<76 U	10 *	2.3	0.14	<0.1
1283-5012					<214.6 U	14.9 *	3.1	0.1	<0.3
1283-5012 D	<1000	<5000	<1	NA	<99.47 U	19.86 *	3.49	0.09	<0.14
1288-5001	<1000	<5000	NA	<1	26.5 *	1	0.5	0.07	0.02
1288-5008	<1000	<5000	NA	<1	301.3 *	<4.7	0.6	0.02	<0.2
1289-5001	<1000	<5000	<1	NA	104.1 *	1.1	1.9	0.1	<0.09
1289-5004	<1000	<5000	<1	NA	<77.6 U	0.5	2.3	0.06	<0.08
1290-5001	<1000	<5000	NA	<1	145.7 *	1.7	2.7	0.4	<0.1
1290-5004	<1000	<5000	NA	<1	<95.8 U	1.8	2.4	0.3	<0.1
1290-5008	<1000	<5000	<1	NA	<90.6 U	1	<1.1	<0.05	<0.1
1294-5008 D					<199.8 U	13.1 *	3.8	0.1	<0.3
1294-5008	<1000	<5000	<1	NA	<90.8 U	16.32 *	1.75	0.13	<0.11
1294-5012	<1000	<5000	<1	NA	<177.3 U	8.4 *			
1295-5004	<1000	<5000	<1	NA	158.7 *	1.9			
1295-5012	<1000	<5000	30 *	NA	<81.8 U	0.8			
7202-5008	<1000	<5000	<1	<1	<90 U	0.85			
7203-5004	<1000	<5000	<1	<1	<90 U	1			
7203-5008	<1000	<5000	<1	<1	109.2 *	0.66			
7207-5016	<1000	<5000	<1	NA	<79.47 U	11.64			

5.0 Results

This table lists only those samples whose reported concentrations exceeded the Other Soils field action levels.

Table 5.8 Area 12 Field Sampling Results

Sample ID		PXRF Metals								
		As (102.07)	Ba (1489)	Cd	Cr HI	Cr LO (164.43)	Pb (172)	Hg	Se	Ag (2559)
1213-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1214-5008		<34	166.34	61.256	<347	169.57 *	<10	<37	<14	45.3057
1217-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1218-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1218-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1219-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1223-5004		NA	NA	NA	NA	NA	NA	NA	NA	NA
1223-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1223-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1224-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1224-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1225-0008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1225-5004		NA	NA	NA	NA	NA	NA	NA	NA	NA
1225-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1226-5001		34.376	157.71	<44.5	<347	<60.7	<10	<37	17.251	<29
1226-5004		<34	200.47	<44.5	<347	<60.7	<10	<37	<14	39.5647
1226-5008		<34	157.68	<44.5	<347	<60.7	46.901	<37	20.726	<29
1230-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1231-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1231-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1232-5004		39.836	182.56	<44.5	<347	<60.7	<10	<37	<14	53.8981
1232-5008	D									
1232-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1236-5004		NA	NA	NA	NA	NA	NA	NA	NA	NA
1236-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1236-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1237-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1237-5012		NA	NA	NA	NA	NA	NA	NA	NA	NA
1238-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1242-5004		NA	NA	NA	NA	NA	NA	NA	NA	NA
1242-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1243-5001		NA	NA	NA	NA	NA	NA	NA	NA	NA
1243-5004		NA	NA	NA	NA	NA	NA	NA	NA	NA
1243-5008		NA	NA	NA	NA	NA	NA	NA	NA	NA
1248-5001		<34	142.09	<44.5	<347	237.23 *	18.638	<37	<14	60.2303
1249-5001		<34	221.62	<44.5	<347	172.07	<10	<37	<14	32.0437
1249-5008		<34	179.14	<44.5	<347	187.64 *	<10	<37	<14	<29
1252-5014		<34	69.077	<44.5	<347	216.04 *	<10	<37	<14	66.6592
1253-5004		NA	NA	NA	NA	NA	NA	NA	NA	NA
1255-5008		<34	172.6	<44.5	<347	<60.7	<10	<37	17.974	64.0270
1256-5012		<34	265.26	<44.5	<347	<60.7	10.471	<37	16.01	70.9667
1258-5001		<34	124.65	<44.5	<347	<60.7	<10	<37	29.659	41.7206
1260-5001		<34	177.17	<44.5	<347	<60.7	<10	<37	<14	41.527
1261-5001		<34	198.69	<44.5	<347	<60.7	<10	<37	14.451	<29
1275-5001		NA	NA	NA	NA	NA	NA	NA	NA	NA
1275-5004	D									
1275-5004		78.22	218.72	75.922	<347	<60.7	<10	<37	<14	103.682
1275-5008		<34	350.07	<44.5	<347	<60.7	681.95 *	<37	<14	55.9017
1275-5012		49.705	223.68	<44.5	<347	<60.7	<10	<37	<14	92.4934
1279-5001		49.853	154.3	<44.5	<347	<60.7	22.329	<37	<14	<29
1279-5004		42.393	205.95	<44.5	<347	<60.7	19.227	<37	<14	<29
1280-5001										
1280-5001	D									
1280-5008	D									
1280-5008	D									
1280-5008	D									
1280-5008										
1280-5008		<34	345.22	<44.5	<347	<60.7	376.56 *	<37	<14	<29
1283-5012										
1283-5012	D									
1288-5001		69.236	169.6	<44.5	<347	<60.7	<10	<37	<14	53.4412
1288-5008		54.52	315.1	71.56	<347	<60.7	<10	<37	<14	84.3791
1289-5001		60.401	161.94	<44.5	<347	<60.7	24.008	<37	<14	56.7939
1289-5004		50.12	295.1	<44.5	<347	<60.7	186.22 *	<37	<14	70.5219
1290-5001		<34	336.01	<44.5	<347	<60.7	426.67 *	<37	<14	<29
1290-5004		<34	408.43	<44.5	<347	<60.7	459.31 *	<37	<14	61.9786
1290-5008		<34	233.98	<44.5	<347	<60.7	409.35 *	<37	<14	104.768
1294-5008	D									
1294-5008		69.301	243.44	<44.5	<347	<60.7	<10	<37	<14	62.5456
1294-5012		59.049	170.31	<44.5	<347	<60.7	<10	<37	<14	62.604
1295-5004		66.276	203.18	<44.5	<347	<60.7	<10			67.6443
1295-5012		37.729	261.19	<44.5	<347	<60.7	<10			
7202-5008		<34	266.51	<44.5	<347	<60.7	334.66 *			
7203-5004		<34	316.74	<44.5	<347	<60.7	244.65 *			
7203-5008		50.39	289.32	<44.5	<347	<60.7	114.25			
7207-5016		37.482	213.22	69.786	<347	<60.7	<10			

Table 6.3 Area 9 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net yd^3	Volume Gross yd^3	Minimum	Maximum	Mean
9	A	HAZ	Org	9675ft^2	0'-12'	1600	2136			
	B	HAZ	Org	788ft^2	0.5'-8'	NA	NA			
	C	RAD	Pu	225	4'-8'	33	157	37	37	37
	D	RAD	Pu	450	4'-8'	133	174	141.1	156.2	148.6
	E	HAZ	Org	225	0'-0.5'	NA	NA			
	F	RAD	Pu	225	4'-8'	33	157	27	27	27
	G	HAZ	Org	225	0'-8'	NA	NA			
	H	HAZ	Org	225	0'-0.5'	NA	NA			
	I	RAD	FIDLER Ch2	225	0.5'-4'	33	53.5	10000	10000	10000

Area 10

Table 6.4 shows one sub-area of Area 10 with radioisotopes in excess of D&D action levels for disturbed soil. Surface contamination of Pu238 and elevated concentrations of chromium have been detected in Area 10B. Soil contaminated with Pu and Cr represent 12.5 cubic yards of soil for removal and offsite disposal.

Table 6.4 Area 10 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
10	A	HAZ	Cr, Pb	2475ft^2	0'-8'	NA	NA			
	B	RAD HAZ	Pu, Cr	675	0'-0.5'	12.5	12.5	27.05	41.56	34.3
	C	HAZ	Cr	675	0'-4'	NA	NA			

Area 12

Table 6.5 shows three sub-areas in Area 12 with elevated concentrations of both radioisotopes and hazardous compounds. Plutonium, thorium and radium were identified in these areas as well as elevated concentrations of lead and chromium. These three locations represent 3,962 cubic yards of soil for removal and offsite disposal.

Two other locations in Area 12 contain elevated concentrations of hazardous compounds.

Table 6.5 Area 12 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
12	A	RAD, HAZ	FIDLER	9112	0-12	3783	4657	5000	70000	16408
			Ch2					1000	1350	1117
			FIDLER					5.85	272.1	43.3
			Ch1					5.13	30.43	12.7
			Th					26.5	301.3	144.4
	B	RAD	Ra	900ft^2	0'-8'	108	184.7	55.01	190	121.6
		HAZ	Pu							
	C	RAD	Pu	900ft^2	0-6, 4-12	71	508	102	111.4	105.7
		HAZ	Org, Cr							
	D	HAZ	Pu	225	4'-8'	NA	NA			
	E	HAZ	Org	225	8'-16	NA	NA			
			Org							
			Org							

Area 20

Table 6.6 shows two sub-areas of Area 20 with elevated concentrations of Pu in the 0- to 4-foot interval. These locations represent 133 cubic yards of soil exceeding D&D action levels for disturbed soil. Four other locations contain elevated concentrations of organic compounds.

Table 6.6 Area 20 Analysis

Area	Sub-Area	Contaminant Type	Contaminant Name	Extent Lateral (ft^2)	Extent Vertical (ft)	Volume Net (yd^3)	Volume Gross (yd^3)	Minimum	Maximum	Mean
20	A	HAZ	Org	2600	4'-12'	NA	NA			
	B	HAZ	Org	2800	0.5'-12'	NA	NA			
	C	HAZ	Org	3200	0'-12'	NA	NA			
	D	RAD	Pu	8000ft^2	0'-4'	74	99	25	38	30
	E	RAD	Pu	400ft^2	0'-4'	59	85	30	30	30
	F	HAZ	Org	400	4'-8'	NA	NA			

Area 23

Table 6.7 shows three sub-areas of Area 23 with elevated concentrations of radioisotopes. Two contain plutonium and represent 237 cubic yards of soil. The third contains 59 cubic yards of soil contaminated with thorium. Five other locations in Area 23 contain elevated concentrations of organic compounds.

PRS 273
SUPPLEMENTAL DATA

COMPLETE RADIOLOGICAL DATA SET (HITS AND NONHITS)

Sample ID	Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1012-5001	01	0.67	1.74	.08	<1.82	1.04	<0.4	<1.73	<18.08	<0.02
1012-5004	<0.03	0.14	1.62	<0.18	<4.58	0.93	<0.62	<4.08	<39.6	<0.0
1015-5001	<0.03	0.37	2.04	<0.2	<4.95	0.85	<1	<4.93	<51.49	<0.06
1015-5004	<0.01	0.07	1.84	<0.08	<3.47	0.87	<0.4	<1.82	<16.91	<0.02
1016-5001	<0.01	0.32	2.04	<0.07	<1.92	0.81	<0.37	<1.48	<15.2	<0.03
1017-5001	<0.02	0.5	1.87	<0.15	<4.03	0.46	<0.89	<3.49	<44.95	<0.04
1017-5004	<0.01	0.2	2.11	<0.07	1.8	0.43	<0.35	2	<18.03	<0.02
1017-5008	<0.02	<0.02	1.57	<0.15	<3.89	0.57	<0.78	<3.9	<34.87	<0.04
1017-5012	<0.02	<0.02	1.33	<0.16	<3.98	0.61	<0.81	<3.71	<32.94	<0.04
1018-5001	<0.02	0.62	1.6	<0.17	<4.2	0.54	<0.85	<3.54	<42.86	<0.04
1018-5008	<0.03	<0.03	2.04	<0.18	<4.5	0.79	<0.89	<4.45	<46.72	<0.05
1019-5001	0.02	0.3	1.9	<0.1	<3.6	0.6	<1.1	<3.2	<45.4	<0.04
1019-5004	<0.02	0.2	1.6	<0.1	<3.6	0.5	<0.8	<3	<40.2	<0.04
1022-5004	<0.02	0.15	2.13	<0.16	<4.27	0.57	<0.74	<3.52	<38.61	<0.04
1023-5001	<0.02	0.2	1.6	<0.1	<3.5	0.5	<0.9	<2.9	<40.5	<0.04
1023-5004	<0.02	<0.1	1.87	<0.15	<3.32	0.58	<0.68	<3.1	<40.16	<0.04
1025-5001	<0.02	0.2	1.6	<0.1	<3.4	0.5	<1	<3	<46.1	<0.04
1025-5004	<0.02	0.2	2	<0.1	<3.6	0.5	<0.8	<3	<37.4	<0.04
1026-5001	<0.02	0.63	1.63	<0.18	<4.06	0.6	<0.9	<3.86	<43.67	<0.04
1026-5004	<0.02	0.08	1.61	<0.17	<4.22	0.53	<0.9	<3.3	<39.6	<0.04
1026-5008	<0.02	<0.02	1.82	<0.14	<3.98	0.51	<0.69	<3.17	<31.29	<0.04
1027-5001	<0.02	0.7	1.6	<0.2	<3.9	0.6	<1	<3.2	<48.4	<0.04
1027-5004	<0.02	0.2	2.2	<0.1	<3.6	0.5	<0.9	[illegible]	[illegible]	[illegible]
1201-5004	0.04	<0.1	2.5	<0.7	<16.13	0.53	<3.49	<17.8	<165.2	<0.17
1201-5008	<0.07	<0.09	2.18	<0.51	<11.93	0.38	<2.77	<9.33	<107.1	<0.13
1202-5001	<0.07	0.12	2.67	<0.44	13.24	<0.31	<2.63	<14.45	<80.11	<0.11
1202-5001	<0.02	<0.02	1.5	<0.1	<2.9	0.3	<1	<2.9	<21.5	<0.03
1202-5004	<0.14	0.16	<1.2	<0.65	19.72	0.76	<3.85	<14.06	<116.3	<0.14
1202-5008	<0.08	0.06	1.98	<0.68	<12.72	0.6	<4.22	<15.72	<139.5	<0.15
1210-5001	<0.1	<0.08	3.34	<0.85	<18.45	1.58	<4.32	<12.03	<189.5	<0.2
1210-5004	<0.08	0.1	<0.92	0.57	<14.66	0.9	<4.14	<12.78	<123.8	<0.15
1210-5008	<0.08	0.06	1.94	<0.76	<15.5	0.78	<2.44	<10.45	<159.4	<0.17
1213-5001	<0.1	<0.14	3.53	<0.88	<20.32	<0.67	<4.14	14.74	<207.9	<0.2
1213-5004	<0.05	<0.1	2	<0.42	<11.85	<0.33	<2.71	<15.68	<116	<0.13
1213-5008	<0.06	<0.1	2.59	<0.57	<12.5	0.18	<2.52	<11.56	<120.5	<0.15
1213-5012	1.18	<0.15	<4.8	2.21	<64.37	33.55	<13.2	<35.35	<440.2	<0.62
1213-5016	<0.11	<0.08	<1.58	<0.74	<15.38	0.57	<4.41	<17.55	<180.8	<0.18
1213-5017	<0.1	0.1	2.61	<0.77	<20.3	2.51	<4.77	<16.23	<153	<0.19
1214-5001	<0.1	<0.1	2.45	<0.76	<17.19	<0.47	<3.85	<18.86	<165.9	<0.21
1214-5004	1.36	<0.09	<1.69	<0.58	<11.85	0.55	3.62	18.04	<128.9	<0.14
1214-5008	<0.09	<0.07	<1.99	<0.8	<18.34	1.35	<3.12	<14.17	<155.9	<0.17
1214-5012	<0.08	<0.1	<0.96	<0.55	<12.14	1.03	<3.62	<11.72	<80.77	0.11
1214-5015	<0.07	<0.07	<1.31	<0.56	<11.62	0.53	<2.91	<9.15	<118.5	<0.11
1217-5001	<0.1	<0.07	2.77	<0.81	<25.72	2.51	<5.49	<16.45	<177	<0.26
1217-5004	<0.13	<0.14	<2.9	<1.11	<2.48	4.12	<6.55	<16.62	<246.3	<0.31
1217-5004	<0.04	<0.08	2.8	<0.3	<8.4	7	<1.8	<5	<52.4	<0.08
1217-5008	<0.18	0.37	<4.43	<2.31	<59.39	22.24	<10.61	<30.41	<459.1	<0.61
1217-5008	<0.08	<0.09	4.1	<0.6	<17.3	32.6	<3.4	<8.5	<100.1	<0.2
1218-5001	<0.13	<0.07	<2.61	<0.8	<16.83	3.54	<6.34	10.61	<183.2	<0.24
1218-5004	<0.14	0.24	<2.92	<1.01	<27.57	3.36	<5.37	<17.43	<202.1	<0.27
1218-5004	<0.03	0.07	3	<0.2	<6.6	2.9	<1.6	<5	<46	<0.06
1218-5012	<0.21	<0.28	11.85	<2.73	<67.72	30.19	<11.76	<29.3	<548.6	<0.68
1219-5001	<0.08	<0.12	3.03	<0.77	<19.5	0.72	<4.1	<10.25	<229.2	<0.21
1219-5004	<0.1	0.27	<2.02	<1.19	<30.45	4.72	<5.11	<15.47	<213.3	<0.24
1219-5008	<0.13	<0.19	<3.29	<1.33	<23.19	6.9	<7.05	<22.83	<335	<0.34
1219-5012	<0.1	<0.05	3.5	<0.58	<17.43	<0.61	<3.55	<13.77	<126.6	<0.17
1220-5001	0.86	0.19	2.16	<0.57	<14.11	0.61	<4.21	<19.93	<137.6	<0.14
1220-5004	<0.07	<0.09	1.82	<0.52	<15.48	1.91	<2.8	<11.76	<133.3	<0.14
1220-5008	<0.08	0.06	<1.27	<0.32	<12.09	0.33	<2.41	<7.97	<83.45	<0.09
1220-5012	<0.06	<0.06	<1.22	<0.5	<11.71	0.36	1.87	<7.74	<35.81	<0.12
1223-5001	<0.08	0.21	<1.83	<0.72	<17.27	<0.83	<3.67	12.46	<100.7	<0.14
1223-5004	<0.09	<0.14	<2.39	<0.89	<22.11	1.09	<2.36	<14.52	<168.1	<0.18
1223-5008	<0.5	<0.66	17.69	<4.82	<127.4	193.3	<28	<62.8	<980.9	<1.51
1223-5012	<0.48	<0.65	30.43	7.21	<163.8	161.5	<29.12	<65.4	<1227	2.1

Sample ID		Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1224-5001		<0.1	0.21	<2.24	<0.72	<19.87	1.02	<4.47	<20.36	<152.4	<0.18
1224-5004		<0.13	<0.16	<2.98	1.51	<28.56	4.46	<5.3	<17.83	<231.9	<0.31
1224-5008		<0.26	<0.39	14.81	<2.89	<86.89	61.87	<15.6	<36.13	<555.3	0.86
1225-0008		<0.2	<0.3	13.8	<2.7	<75.7	104	<12.7	<31.6	<583.7	<0.7
1225-5001		<0.14	<0.15	<1.46	<1.04	<26.61	3.34	<5.14	<17.38	<234.6	<0.29
1225-5004		<0.12	0.18	<3.28	<1.03	<30.89	7.52	<5.54	<21.66	<203.1	<0.3
1225-5008		<0.5	<0.73	17.03	6.76	<167.4	212.1	<29.51	<10.82	<1260	<1.66
1226-5001		0.07	<0.16	2.88	<0.84	<22.61	3.3	<4.88	<12.42	202.5	<0.23
1226-5004		<0.13	0.22	<3.55	<1.07	<32.19	6.94	<6.39	<14.46	<253.2	<0.33
1226-5008		<0.1	<0.08	5.13	<0.85	<23.01	2.02	<5.18	<13.47	<151.7	<0.24
1226-5012		<0.1	0.18	2.74	<0.62	<18.37	0.53	<4.23	<5.6	<146	<0.18
1227-5001		<0.09	<0.12	<2.49	<1	<25.84	1.6	<5.39	<17.94	<229.9	<0.21
1227-5004		<0.08	0.24	<2.03	<0.49	<15.38	1.24	<3.69	<14.28	<110.2	<0.16
1227-5008		0.06	0.11	2.11	<0.42	<12.61	0.48	<2.77	<12.4	<110.7	<0.1
1227-5010		<0.12	<0.07	1.6	<0.7	<15.33	<0.37	<3.63	<15.14	<135	<0.16
1227-5012		<0.12	<0.07	1.6	<0.7	<15.33	<0.37	<3.63	<15.14	<135	<0.16
1230-5001		<0.05	<0.07	2.39	<0.75	<16.09	0.99	<2.4	<10.27	<161.9	<0.17
1230-5004		<0.22	0.11	<1.52	<0.51	<13.79	0.92	<2.94	<14.06	<138.9	<0.12
1230-5008		<0.31	<0.4	14.82	<3	<95.8	89.78	<18.05	<37.95	<625.6	<0.92
1231-5001		<0.12	0.26	<1.93	<0.78	<17.09	0.82	<3.62	<12.71	<148.7	<0.19
1231-5004		<0.15	<0.14	2.09	<0.63	24.01	0.82	<4.07	<13.22	<145.7	<0.14
1231-5008		<0.19	<0.26	<5.85	<2.28	<57.08	21.35	<11.27	<22.12	<481.7	<0.58
1231-5012		<0.42	<0.53	<12.68	<5.07	<132.7	121.4	<23.82	<50.26	<1025	2.54
1232-5001	D	<0.09	<0.1	2.42	<0.89	<17.62	0.85	<4.29	<11.02	<188	<0.19
1232-5001		<0.11	0.14	<2.28	0.63	22.92	0.76	<3.64	<19.09	<151.2	<0.17
1232-5004	D	<0.08	0.14	5.53	<1.48	<35.19	5.85	<5.78	<20.65	<270.4	<0.39
1232-5004		<0.13	<0.15	<2.87	<1.03	<27.11	4.53	<5.4	<18.82	<259.6	<0.32
1232-5008	D	<0.1	<0.22	4.09	<1.36	<42.95	12.55	<7.97	20.31	<295.8	<0.43
1232-5008		<0.23	<0.15	<5.86	<2.05	<61.63	37.57	<10.83	<24.52	<391.9	<0.84
1232-5012	D	0.07	0.16	1.93	<0.54	<15.73	1.48	<3.34	<12.93	<140.6	<0.15
1232-5012		<0.1	<0.07	2.39	<0.67	<21.63	1.7	<3.44	<12.17	<170.3	<0.19
1232-5015		<0.11	<0.08	1.87	<0.73	<19.47	<0.92	<4.22	<9.66	<167.3	<0.16
1233-5001		<0.12	0.14	2.39	<0.62	<16.69	0.73	<4.24	<13.38	<167.1	<0.18
1233-5004		<0.11	<0.1	3.19	<0.81	<22.09	1.89	<4.54	<12.58	<185.1	<0.23
1233-5008		<0.09	<0.1	<1.89	<0.78	<18.48	1.35	<3.62	<12.58	<198.1	<0.19
1233-5012		<0.1	<0.1	<1.79	<0.7	<18.99	0.49	<2.62	<12.37	<145.4	<0.17
1234-5001		<0.15	<0.13	2.08	<0.64	<17.76	0.69	<3.96	<11.71	<202.7	<0.21
1234-5004		<0.11	0.17	<1.92	0.53	<13.99	1.17	<2.63	13.31	<146.8	<0.17
1234-5008		<0.09	0.13	1.68	<0.48	<11.55	0.69	<2.42	<12.4	<108.4	<0.11
1234-5008		<0.03	<0.02	2.3	<0.2	<5.6	0.8	<1.3	<4	<62.3	<0.06
1235-5001		<0.1	<0.14	3.53	<0.88	<20.32	<0.67	<4.14	14.74	<207.9	<0.2
1236-5001		1.74	0.23	<2.49	<0.86	<21.1	<0.51	<5.96	<24.86	<180.4	<174.1
1236-5004		<0.11	<0.17	<1.89	<0.69	<18.03	2.69	<4.6	13.13	<142.3	<0.18
1236-5008		0.33	0.43	8.46	<2.3	<67.74	47.61	<12.64	<24.36	<341.6	<0.66
1237-5001		<0.07	0.05	2.91	<0.79	<17.71	0.51	<4.75	<9.05	<170.3	<0.2
1237-5004		<0.08	0.1	2.45	<0.4	<13.23	0.54	<2.86	<11.95	<117.6	<0.13
1237-5008		<0.15	0.17	<3.1	<1.13	<28.07	3.94	<5.4	10.74	<275.3	<0.27
1237-5008		<0.03	<0.07	2.2	<0.55	<11.2	6.24	<2.2	<4.83	<93.81	<0.11
1237-5012		<0.43	<0.59	<12.38	<4.45	<137	185.8	<25.65	<52.36	<899.1	<1.35
1238-5001		<0.14	0.32	4.34	<0.75	<19.98	<0.55	<4.65	<18.74	<179.4	<0.22
1238-5004		<0.09	<0.08	<1.7	0.6	<16.62	0.52	<1.74	<9.63	<166.7	<0.16
1238-5008		<0.17	<0.23	<4.8	<1.53	<48.11	16.75	<8.87	<21.96	<322.2	<0.46
1239-5001		<0.11	<0.08	4.77	<0.84	<18.71	0.99	<3.28	<15.86	<207.5	<0.19
1239-5004		<0.1	0.09	2.81	<0.68	<16.9	0.85	<3.13	<8.14	<47.77	<0.18
1239-5008		<0.07	0.24	<1.23	<0.76	29.03	2.24	4.08	<11.05	<155.4	<0.18
1239-5012		<0.11	0.13	1.92	<0.52	<15.64	0.5	<3.9	<15.11	<98.94	<0.14
1239-5016		<0.08	<0.06	<0.75	<0.78	<14.78	0.74	<2.63	15.07	<135.8	<0.15
1240-5001		<0.13	0.06	2.56	<0.69	<13.58	0.5	<3.17	<10.74	<177.9	<0.14
1240-5004		<0.12	0.09	<1.88	<0.59	<11.99	0.69	<3.93	<15.37	<177.8	<0.15
1240-5008		<0.06	<0.08	<2.06	<0.58	<16.26	0.74	<2.71	<13.11	<144.1	<0.17
1240-5012		<0.09	<0.09	<1.7	<0.65	<15.8	0.63	<3.34	<12.46	<129.8	<0.16
1242-5001		<0.04	<0.04	1.9	<0.3	<6.9	1.2	<2.2	<6.2	<59.3	<0.07
1242-5004		<0.21	<0.27	6.76	2.24	<58.08	25.39	<10.78	<26.52	<374.7	<0.54
1242-5008		<0.21	<0.31	<7.75	<2.89	<78.13	46.27	22.3	<28.03	<568.4	<0.77

Sample ID		Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1242-5012		<0.13	0.1	<1.75	<0.6	<15.6	1.14	<3.71	<12.03	<128.8	<0.16
1243-5001	D	<0.11	<0.08	1.53	<0.72	<15.23	0.5	<3.61	<12.56	<169.8	<0.18
1243-5001		<0.13	<0.2	<4.61	<1.91	<49.84	14.42	<8.78	<21.14	<352	<0.5
1243-5004		<0.18	<0.24	5.77	<1.73	<48.93	20.44	<9.63	<21.51	<344.4	<0.5
1243-5012		<0.1	0.12	1.88	<0.53	<13.47	0.72	3.17	<11.49	<143.4	<0.15
1244-5001		<0.09	0.06	2.33	<0.62	<12.43	0.51	<3.01	<11.17	<116.6	<0.15
1244-5004		<0.15	<0.1	<1.99	<0.83	<14.72	0.82	<3.56	<7.76	<168.1	0.15
1244-5008		<0.03	<0.06	1.6	<0.3	<7.8	0.9	<1.8	<4.9	<63.8	<0.07
1245-5001		<0.09	<0.08	3.03	0.56	<17.67	0.84	<2.77	<15.94	<133.7	<0.16
1245-5004		<0.09	0.16	<1.7	<0.45	<9.57	<0.37	<3.31	<10.76	<108.2	<0.11
1245-5008		<0.1	<0.09	<1.18	<0.59	<14.15	1.33	<2.35	<15.11	<105.2	<0.12
1245-5012		<0.08	0.09	2.41	<0.46	<13.28	0.78	<2.69	<9.33	<113.4	<0.13
1247-5001		<0.07	<0.11	<2.15	<0.63	<17.42	0.83	<4.41	<15.78	<200.9	<0.16
1247-5004		<0.09	<0.05	<1.78	<0.66	<11.39	0.37	<2.69	<7.61	<127.5	<0.15
1247-5008		<0.05	<0.06	1.42	<0.58	15.06	0.58	<2.98	<5.89	<132.1	<0.13
1247-5012		<0.08	<0.07	<1.63	<0.65	<16.48	<0.64	<2.63	<11.3	<131.3	<0.13
1247-5015		<0.07	<0.07	<1.72	<0.53	<13.92	0.28	<3.58	<17.2	<158.6	<0.18
1248-5001	D	<0.02	<0.02	1.34	0.38	5.01	1.38	<0.88	<3.02	190	<0.04
1248-5001		<0.08	<0.14	1.6	<0.67	<20.07	0.94	<5.06	10.78	<127.8	<0.2
1248-5004		<0.04	0.11	<1.48	<0.58	<14.11	0.72	<2.91	<17.82	<76.1	<0.17
1248-5008		<0.06	0.07	<1.31	<0.51	13.19	0.3	<3.83	<10.25	<156.9	<0.13
1248-5010		<0.09	<0.1	<1.46	<0.8	<13.92	0.59	<3.27	<17.39	<78.43	<0.17
1249-0001	D	<0.02	0.04	0.8	<0.1	<3.5	0.6	<0.5	0.7	<42.4	<0.04
1249-0001		<0.05	<0.04	1.8	<0.4	<7.1	0.4	<1.4	<4.4	<75.6	<0.07
1249-5001		<0.14	0.14	2.36	0.52	<17.13	0.72	<4.18	<10.24	119.8	<0.15
1249-5004		<0.08	<0.12	<1.89	<0.65	<15.27	0.48	<3.4	<15.82	<167	<0.18
1249-5008		<0.08	0.14	2.67	<0.77	<12.78	<0.37	<3.78	<12.28	<107.2	<0.19
1249-5009		<0.1	0.24	2.9	<0.68	<16.38	0.62	<3.54	<12.72	<143.4	<0.17
1251-5001		<0.11	<0.13	2.09	<0.6	<15.72	0.65	<4.13	<17.35	<155.5	<0.14
1251-5004		<0.05	<0.07	<1.81	<0.55	15.48	0.42	<2.87	<11.24	<104.4	<0.13
1251-5008		<0.1	0.18	3.49	0.53	<13.2	1.05	<3.43	<17.26	<121.9	<0.16
1251-5012		<0.06	0.05	<1.49	<0.52	<13.68	0.79	<3.3	<11.66	<98.97	<0.13
1251-5014		<0.1	<0.1	<1.73	<0.51	<13.78	0.57	<3.33	<16.95	<126.2	<0.13
1252-5001		<0.11	0.22	<1.36	<0.47	<15.07	0.35	<2.8	<15.41	<134.5	<0.13
1252-5004		<0.09	0.07	<1.7	0.6	<14.17	0.75	<2.77	6.8	<155.6	<0.16
1252-5008		<0.12	<0.18	3.91	<0.6	<14.08	0.75	<4.49	<15.43	<90.45	<0.16
1252-5012		<0.11	<0.06	2.13	<0.59	<15.46	0.51	<4.14	<13.48	<123.3	0.15
1252-5014		<0.13	0.19	<1.91	<0.56	<15.9	0.64	<2.99	<20.94	<136.2	<0.16
1253-5001		<0.08	<0.07	<1.79	<0.57	<14.28	0.4	<2.19	<14.32	<128.1	<0.12
1253-5004		0.06	<0.17	3.11	<0.68	<18.28	1.47	<3.51	<14.1	<124.8	<0.17
1253-5008		<0.11	0.14	<1.83	0.49	<15.19	0.88	<3.55	<11.52	<143.1	<0.13
1253-5009		<0.08	0.07	1.7	<0.49	<14.26	0.62	<2.84	<10.36	<142.9	<0.15
1255-5001		<0.13	<0.09	<1.63	<0.53	<14.32	<0.32	<3.31	<17.33	<127.1	<0.11
1255-5004		<0.07	<0.06	<1.06	<0.59	<11.58	<0.27	<2.95	<12.7	<127.2	<0.13
1255-5008		<0.11	0.17	<1.67	<0.58	<14.64	0.57	<3.88	<11.77	103.8	<0.17
1255-5012		<0.07	0.12	<1.68	0.44	<13.61	0.66	<3.3	<14.51	<106.6	<0.13
1256-5001		<0.1	0.12	1.81	<0.64	<13.52	0.73	<4.13	<15.46	<119.7	<0.14
1256-5004		<0.07	0.06	<1.6	<0.46	<11.35	0.44	<2.38	11.19	<109.7	<0.12
1256-5008		<0.12	0.05	3.12	<0.6	<15.68	0.96	<2.67	<11.91	<126.7	<0.13
1256-5012		<0.09	0.2	1.79	<0.45	<13.42	0.68	<3.55	<16.06	102	<0.15
1256-5016		<0.09	<0.09	1.56	<0.5	<13.12	0.38	<2.2	<12.85	<98.98	<0.13
1257-5001		<0.06	0.16	2.36	<0.53	<12.35	0.48	<4.09	13.76	<79.81	<0.16
1257-5004		<0.1	0.16	2.41	<0.54	<13.66	0.88	<3.49	<13.51	<132.9	<0.19
1257-5008		<0.08	<0.11	<1.81	<0.86	<14.66	0.3	<2.65	<15.49	<155.3	<0.15
1257-5012		<0.1	<0.11	<1.9	<0.8	<14.98	0.76	<4.14	<18.12	<215.5	<0.18
1257-5014		<0.09	0.16	1.95	0.53	<13.18	0.74	<3.55	<16.56	<107	<0.13
1258-5001		<0.09	<0.06	<1.46	<0.55	<9.49	0.3	<2.67	<18.02	55.01	<0.12
1260-5001		<0.07	<0.09	<1.45	0.39	14.72	0.33	<2.94	<11.33	<99.55	<0.11
1260-5004		0.03	<0.05	<1.12	<0.51	<15.43	0.39	<3.08	<14.68	<133.6	<0.14
1260-5004		<0.07	<0.03	2.4	<0.3	<5.9	0.6	<1.2	<5.3	<55.6	<0.06
1260-5008		<0.07	<0.1	<1.54	<0.55	15.64	0.45	<3.08	<8.9	<135.5	<0.14
1260-5012		<0.07	<0.1	2.47	0.62	<13.66	0.81	<3.79	<10.59	<102.5	<0.14
1261-5001		<0.08	<0.1	<2.02	0.69	<12.54	<0.38	<3.54	<13.76	111.4	<0.16
1261-5004		<0.07	<0.08	<1.65	<0.61	<16.87	0.27	<3.34	<11	<149.5	<0.12

Sample ID		Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1261-5004		<0.02	<0.03	2.1	<0.2	<5.3	0.6	<1.1	<4.3	<57.2	<0.06
1261-5008		<0.1	<0.07	<1.97	0.53	<13.69	0.75	<3.71	<16.98	<115.2	<0.15
1261-5012		<0.1	<0.07	1.82	<0.8	<15.55	0.94	<3.46	<10.27	<177.1	<0.15
1262-5001		<0.08	<0.06	2.19	<0.41	<13.52	0.39	<3.48	<14.47	<112.9	<0.13
1262-5004		<0.1	0.06	1.72	<0.63	<11.89	0.49	<3.99	<9.38	<121.1	<0.15
1262-5004		<0.03	<0.03	1.4	<0.3	<5.3	0.6	<1.2	<4.8	<56.5	<0.06
1262-5008		<0.1	0.17	2.35	<0.54	<14.03	0.77	<3.91	<16.02	<119.3	<0.14
1262-5008		<0.03	0.07	2.1	<0.1	<4.3	0.8	<1.2	<3.9	<27.3	<0.04
1262-5012		<0.07	<0.06	<2.18	<0.54	<13.29	0.45	<2.87	<12.35	<118.5	<0.14
1263-5001		<0.1	0.07	2.19	<0.42	<9.08	0.59	<2.73	<11.42	<103.2	<0.11
1263-5004		<0.06	<0.08	<1.52	<0.63	<13.77	0.76	<3.08	<15.19	<133.3	<0.16
1263-5008		<0.08	0.13	<1.61	0.47	<12.05	0.66	<2.47	<11.02	<118.7	<0.12
1263-5011		<0.08	<0.1	<1.52	<0.59	<11.73	0.29	<2.12	<11.33	<154.1	<0.13
1265-5001		<0.07	0.15	<1.58	<0.59	<11.97	<0.35	<2.93	<11.9	<134.9	<0.11
1265-5004		<0.13	0.26	4.06	<0.62	<16.72	<0.35	<4.43	<18.5	<143.3	<0.17
1265-5008		<0.07	<0.09	2	<0.59	<17.28	0.42	<3.43	<10.77	<148.5	<0.18
1265-5008		<0.03	<0.03	1.6	<0.1	<3.3	0.5	<1.2	<3.6	<27.9	<0.03
1265-5012		<0.11	<0.08	<1.72	<0.73	<13.2	0.42	<3.62	<13.39	<182	<0.16
1266-5001		<0.09	<0.09	<1.47	0.47	<12.85	<0.31	<2.32	<10.97	<83.72	<0.11
1266-5001		<0.03	<0.03	1.8	<0.2	<5.5	0.6	<1.2	<5.2	<57	<0.06
1266-5004		<0.1	<0.1	2.08	<0.55	<15.99	0.4	<3.82	<11.89	<120.4	<0.15
1266-5008		<0.07	<0.06	2.6	0.52	<10.18	0.29	<3.6	<10.59	<133.2	<0.12
1266-5008		<0.03	<0.03	1.6	<0.2	<5.1	0.7	<1.2	<4.6	<51.1	<0.05
1266-5012		<0.07	0.04	2.69	<0.49	<14.15	0.52	<2.83	<12.33	<94.79	<0.13
1267-5001		<0.08	<0.14	2.43	<0.52	12.86	0.49	<2.34	<15.39	<138	<0.12
1267-5004		<0.08	<0.09	2.1	<0.54	<13.55	<0.35	<2.92	<9.84	<152.5	<0.13
1267-5008		<0.08	0.2	2.74	<0.49	<10.83	0.55	<2.63	<9.24	<121.6	<0.12
1267-5012		<0.09	<0.07	2.87	<0.63	<15.01	0.66	<3.16	<13.6	<172.9	0.17
1268-5001		<0.02	<0.08	<1.29	<0.55	<11.13	<0.27	<2.68	<10.78	<130.5	<0.14
1268-5004		<0.07	0.11	1.98	<0.62	<11.96	0.74	<3.13	<11.49	<105.9	<0.11
1268-5008		<0.1	<0.12	<2.02	<0.9	<18.13	0.67	<3.06	<12.31	<197	<0.22
1268-5010		<0.09	<0.09	<2.11	<0.71	<17.97	0.51	0.63	<18.34	<141.7	<0.16
1269-0001	D	<0.01	<0.01	0.77	<0.1	<2.32	0.2	<0.43	<1.44	<23.06	<0.02
1269-0001		<0.03	<0.01	1.1	<0.3	<5	0.2	<1.1	<3	<56.4	<0.05
1269-5001		<0.06	<0.05	<0.98	0.47	<9.47	<0.17	<1.8	<9.6	<73.35	<0.09
1269-5004		<0.06	0.06	2.3	<0.55	<15.08	0.63	<3.96	<12.43	<168.3	<0.19
1269-5008		<0.07	<0.12	2.95	<0.6	<16.23	0.54	<4.01	<12.62	<142.6	<0.17
1272-5001	D	<0.02	<0.02	1.1	<0.1	<3.5	0.5	<0.8	<2.3	<27.5	<0.03
1272-5001		<0.05	<0.04	1.6	<0.4	<7.1	0.6	2	<6.1	<75.5	<0.08
1272-5004	D	<0.02	<0.02	1.6	<0.13	<3.9	0.86	<0.85	<3.7	<32	<0.04
1272-5004		<0.04	<0.05	1	<0.3	<9	0.9	<2.4	<5.5	<76.1	<0.09
1272-5008	D	<0.02	<0.02	1.59	<0.15	4.14	0.57	<0.79	<3.12	<30.08	<0.04
1272-5008		<0.05	<0.04	1.5	<0.4	<9.7	0.7	<1.8	<6.6	<76.9	<0.08
1272-5012	D	<0.02	<0.02	0.4	<0.1	<3.7	0.6	<0.5	0.4	<39.8	<0.04
1272-5012		<0.06	<0.04	1.1	<0.3	<9.6	0.6	<2	<5.8	<79.8	<0.09
1272-5016	D	<0.02	<0.02	1.1	<0.1	<3.5	0.6	<1	<3.8	<36.6	<0.04
1272-5016		<0.06	<0.05	1.5	<0.4	<7.4	0.6	<2.7	<7.6	<74.3	<0.07
1274-5001		<0.02	0.07	1.41	0.37	<5.48	2.08	0.34	4.77	<57.9	<0.06
1274-5004		<0.02	0.05	1.1	0.1	4.3	0.9	<0.6	1.7	<44.6	<0.05
1274-5008		<0.02	<0.02	0.7	<0.1	<3.8	0.7	<0.5	0.8	<42.8	<0.04
1275-5001	D	<0.02	0.09	3.2	<0.2	<5.2	1.4	<1.3	9.6	<48.4	<0.06
1275-5001		<0.07	<0.08	3.8	<0.6	<11.5	1.4	<3.1	<10.3	<147.5	<0.1
1275-5004	D	<0.04	0.12	1.5	0.5	11	14.6	<1	2.7	<91.7	<0.1
1275-5004		<0.09	0.1	3.9	<1	<26.6	13.1	<7	<11.8	<222.9	<0.3
1275-5008		<0.02	0.07	2.4	<0.3	17	1	<1.3	<3.7	<42.1	<0.05
1275-5012	D	<0.02	<0.02	1.34	<0.17	<3.92	0.65	<0.77	<3.38	170.3	<0.04
1275-5012		<0.05	<0.04	1	<0.4	<8.3	0.8	<2.2	<7.8	<82.2	<0.1
1275-5016	D	<0.02	<0.02	1.69	<0.16	<3.98	1.02	<0.78	<4.08	<40.29	<0.04
1275-5016		<0.06	<0.04	2.2	<0.4	<9.4	1	<2.7	<7.4	<98.9	<0.1
1275-5020	D	<0.03	0.09	2	<0.47	<8.2	1.9	<1.3	<3.8	<52	<0.06
1275-5020		<0.05	0.07	1.9	<0.5	<12.5	2.1	<4.5	<10	<101.4	<0.1
1277-5001	D	<0.02	0.05	0.6	<0.1	<3.7	0.7	<0.5	<0.7	<36.9	<0.04
1277-5001		<0.04	<0.04	1.9	<0.4	<8.2	0.8	<2.4	<6.9	<85	<0.08
1277-5004	D	<0.02	<0.02	1.3	<1	<3.2	0.4	<0.8	<2.7	<35.2	<0.04

Sample ID		Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1277-5004		<0.05	<0.04	<0.9	<0.4	<7.6	0.5	<1.8	<4.6	<74.8	<0.07
1277-5008	D	<0.02	0.02	1.25	<0.14	<3.39	0.55	<0.58	<2.57	<31.54	<0.04
1277-5008		<0.05	<0.03	1	<0.3	<7.6	0.6	<2.2	<5.3	<93.9	<0.08
1277-5012	D	<0.02	<0.02	0.4	<0.13	<3.51	0.54	<0.56	0.55	<41.9	<0.04
1277-5012		<0.05	<0.05	<0.9	<0.4	<8	0.5	<2.2	<6.1	<73.7	<0.07
1279-5001		<0.04	0.4	0.8	<0.3	<8.5	7.1	<0.8	1.3	<69.3	<0.1
1279-5004		<0.03	0.2	2.4	<0.3	<8.5	5.9	<1.4	<4.5	<62	<0.08
1280-5001	D	<0.04	0.1	1.4	<0.4	4.4	10.4	<0.9	1.7	<90.4	<0.1
1280-5001		<0.08	<0.1	<2.5	<1	<25.3	11.3	<10.5	<12.2	<207.4	<0.2
1280-5008	D	<0.04	0.09	2	<0.4	<9.8	11.1	<2.5	<5.7	<78.4	<0.1
1280-5008	D	<0.08	<0.1	2.9	<1.5	<26.9	11.5	<13.7	<18.1	<191.3	<0.3
1280-5008	D	<0.1	<0.1	4.7	<0.8	<24.8	9.8	13.4	<14	<187	0.3
1280-5008		<0.04	0.14	2.3	<0.3	<10.3	10	<1.9	<5.7	<76	<0.1
1280-5012	D	<0.02	<0.02	1.4	<0.2	<4.4	0.76	<0.84	<4.1	<38	<0.04
1280-5012		<0.05	<0.05	2.3	<0.4	<9.2	0.6	<3	<7.9	<85.3	<0.09
1280-5016	D	<0.03	<0.02	0.5	<0.2	<4.1	0.8	<0.6	0.5	<47.7	<0.04
1280-5016		<0.05	0.06	2.1	<0.5	<9.5	0.7	<2.8	<10.5	<92	<0.09
1283-5001	D	<0.02	0.06	1.3	<0.1	<4.3	1.1	<1.3	<4.2	<39.6	<0.05
1283-5001		<0.06	<0.07	2.2	<0.4	<10.2	1.3	3.8	<8.7	<74.2	<0.1
1283-5004	D	<0.03	0.05	1.98	<0.26	<7.04	4.7	<1.25	<3.54	<56.57	<0.07
1283-5004		<0.07	<0.07	1.5	<0.6	<14.4	4.2	6.2	<8.3	<115.8	0.2
1283-5008	D	<0.02	0.03	0.8	<0.1	<2.1	0.9	<0.5	0.6	<42	<0.04
1283-5008		<0.04	<0.05	1.1	<0.4	<8.6	0.8	<1.9	<5.6	<71.2	<0.08
1283-5012	D	<0.04	0.09	3.49	3.47	<13.54	16.86	<2.23	<5.44	<99.47	<0.14
1283-5012		<1	0.1	3.1	<1	<27.9	14.9	18.4	<12.9	<214.6	<0.3
1283-5016	D	<0.02	<0.02	1.05	0.26	<3.88	0.74	<0.85	<3.41	<36.36	<0.04
1283-5016		<0.07	<0.05	2.1	<0.4	<8.9	0.9	<2.1	<8.9	<88.4	<0.1
1284-5001		<0.05	<0.06	<1	<0.3	<9.5	1.4	<2.8	<6.3	<83.3	<0.1
1284-5004	D	<0.02	0.01	0.67	<0.13	<3.52	0.47	<0.55	0.54	<39.6	<0.04
1284-5004		<0.04	<0.03	1.4	<0.4	<8.3	0.5	<2	<5.5	<87.8	<0.08
1284-5008	D	<0.02	<0.02	0.5	<0.1	<3.4	0.4	<0.5	0.4	<36.9	<0.04
1284-5008		<0.05	<0.04	2	<0.3	<7.1	0.5	<1.6	<5.8	<76.2	0.1
1284-5012	D	<0.02	<0.02	1.7	<0.15	<4.3	0.85	<1.1	<3.4	<37	<0.05
1284-5012		<0.06	<0.05	1.9	<0.4	<9.9	0.8	<2.9	<8.6	<90.3	<0.09
1288-5001	D	<0.02	0.06	1.2	<0.1	<3.7	0.4	<1	<3	<29.4	<0.04
1288-5001		<0.02	0.07	0.5	<0.2	1.6	1	<0.6	0.4	26.5	0.02
1288-5004	D	<0.02	0.1	1.5	<0.2	<4.1	1	<1	<2.9	<33.8	<0.04
1288-5004		<0.02	0.2	0.8	<0.1	<4.2	<1.2	<0.6	0.4	<44.8	<0.04
1288-5008		<0.03	0.02	0.6	<0.2	<11.2	<4.7	<0.6	0.4	301.3	<0.2
1288-5012	D	<0.02	<0.02	0.5	<0.2	<3.9	0.8	<0.5	0.5	<39.9	0.02
1288-5012		<0.02	<0.02	1.1	<0.2	<3.7	0.7	<1	<3.4	<36.7	<0.04
1289-5001		<0.06	0.1	1.9	<0.3	<8.7	1.1	3.1	<5.8	104.1	<0.09
1289-5004	D	<0.01	0.06	1.1	<0.13	<3.31	0.53	<0.67	<2.32	<27.15	<0.03
1289-5004		<0.04	0.05	2.3	<0.3	<7.8	0.5	<1.9	<5.9	<77.6	<0.08
1290-5001	D	<0.03	0.37	1.9	0.65	5.8	1.69	<1.28	<4.24	<225.5	<0.06
1290-5001		<0.06	0.4	2.7	<0.5	<11.4	1.7	<3.4	<8.5	145.7	<0.1
1290-5004	D	<0.03	0.23	2.3	<0.18	<5.3	1.5	<1.1	<4.1	<43	<0.05
1290-5004		<0.06	0.3	2.4	<0.5	<11.6	1.6	<3.3	<8.2	<95.8	<0.1
1290-5008	D	<0.02	0.04	0.5	<0.15	<4.3	1	<0.5	0.6	<43.2	<0.04
1290-5008		<0.05	<0.05	<1.1	<0.4	<10.1	1	<2.1	<7.2	<90.6	<0.1
1290-5012	D	<0.02	<0.02	0.5	<0.1	<3.8	0.7	<0.5	0.5	<39.3	<0.04
1290-5012		<0.07	<0.04	1.7	<0.3	<7.9	0.7	<1.9	<8.1	<90.7	<0.08
1294-5001	D	<0.02	0.07	1.4	<0.15	<3.9	0.6	<0.9	<3.5	<38	<0.04
1294-5001		<0.06	<0.06	1.2	<0.4	<7.8	0.4	<2.9	<7.9	<91.4	<0.09
1294-5004		<0.01	0.04	1.6	<0.1	<2.9	0.31	<0.6	<2.2	<31	<0.03
1294-5008	D	<0.03	0.13	1.75	<0.34	<11.15	15.32	<0.91	1.77	<90.8	<0.11
1294-5008		<0.09	0.1	3.8	1.8	<29.1	13.1	15	<11.3	<199.8	<0.3
1294-5012		<0.07	0.3	<2	<0.9	<21.9	8.4	<10.3	<10.1	<177.3	<0.2
1295-5001	D	<0.03	0.04	0.6	<0.2	<6.5	3.6	<0.7	0.9	<57.3	<0.07
1295-5001		<0.06	<0.07	<1.4	<0.6	<16	3.2	<4.2	<7.2	<124.7	<0.2
1295-5004		<0.06	<0.05	1.2	<0.4	<12	1.9	<3.2	<5.4	158.7	0.1
1295-5008	D	<0.02	0.07	1.41	<0.16	<3.46	0.65	<0.67	<2.89	<35.64	<0.04
1295-5008		<0.04	0.09	2.1	<0.3	<8.9	0.7	<2.4	<5.7	<78.2	<0.09
1295-5012	D	<0.02	0.04	1.54	<0.17	<4.07	0.68	<0.77	<3.03	<37.72	<0.04

Sample ID		Co 60	Cs 137	Ra 226	Ac 227	Th 230	Th 232	Pa 231	U 238	Pu 238	Am 241
1295-5012		<0.06	<0.05	1.3	<0.4	<9	0.8	<2.2	<7.1	<81.6	<0.09
1296-5001		<0.02	<0.02	1.7	<0.2	<3.8	0.66	<0.73	<2.5	<36	<0.04
1296-5004		<0.02	<0.02	2	<0.13	<3.9	0.54	<0.9	<3.5	<35	<0.04
1296-5008		<0.02	0.01	0.9	<0.2	<3.3	0.43	<0.69	<2.8	<32	<0.04
1296-5012		<0.02	<0.02	0.46	<0.14	<3.76	0.67	<0.49	0.35	<39.5	<0.04
2386-5001		<0.06	<0.1	1.6	0.86	<23.77	0.37	<2.11	<11.54	<221.5	<0.25
2386-5004		<0.1	0.05	1.63	<0.62	<14.43	0.97	<3.16	<16.56	<152.4	<0.16
2386-5008		<0.13	0.1	1.83	<0.61	<16	0.67	<3.15	<14.07	<125.2	<0.16
2386-5012		<0.1	<0.09	1.97	<0.88	<16.96	0.6[illegible]	<3.75	<18.02	<147.2	<0.19
2387-5001		<0.07	<0.1	<1.21	<0.48	<16.79	0.[illegible]	<3.76	<14.12	<124.5	<0.[illegible]
2387-5004		<0.07	<0.09	<2.02	<0.55	<14.27	0.05	<3.14	<11.23	<134.3	<0.13
2387-5008		<0.11	<0.06	2.04	<0.61	<17.54	0.81	<3.16	<15.71	<161.9	0.18
2387-5012		<0.1	<0.09	1.79	0.77	<16.3[illegible]	0.79	<4.66	<14.55	<160.1	<0.18
2389-5001		<0.08	<0.08	2.74	<0.77	<16.26	0.4	<3.46	<8.25	<142	<0.1
2389-5004		<0.08	<0.08	2.74	<0.77	<16.26	0.4	<3.46	<8.25	<142	<0.1
2389-5008		<0.07	<0.07	<1.8	<1.82	<16.7	0.88	<3.85	<19.4	<[illegible]1.4	<0.15
2389-5012		<0.11	<0.09	2.01	<0.59	13.44	0.82	<3.58	<16.01	<111.4	<0.14
7202-5001	D	<0.01	0.1	1.2	<0.0[illegible]	<1.5	0.4	<0.3	<1.3	<14	<0.01
7202-5001		<0.04	0.13	<0.82	0.05	<7.15	0.29	<1.46	<6.72	<63.12	0.07
7202-5004	D	<0.02	0.08	0.4	<0.1	<3.4	0.5	<0.5	0.4	<35.3	<0.04
7202-5004		<0.04	0.05	0.53	<0.25	<7.25	0.49	<0.97	0.5	<75.05	<0.07
7202-5008	D	<0.01	0.01	0.6	0.1	1	0.9	<0.2	0.6	<14.5	<0.01
7202-5008		<0.05	<0.04	2.9	<0.47	<10.4	0.85	<2	<8.4	<90	<0.09
7203-5001	D	<0.02	0.08	1.1	<0.17	<3.96	1.16	<0.83	<2.55	<40.65	<0.04
7203-5001		<0.02	0.11	0.66	0.14	2.31	1.08	<0.6[illegible]	0.44	<42.95	<0.0[illegible]
7203-5004	D	<0.02	0.1	1.29	<0.16	<4.19	0.89	<0.83	<3.2	<36.68	<0.04
7203-5004		<0.04	0.09	<0.97	<0.36	<9.2	1	<1.9	<5.8	<90	0.15
7203-5008	D	<0.02	<0.02	1.6	<0.15	<4	0.66	<0.87	<3.34	<36.17	<0.04
7203-5008		<0.06	<0.04	<0.95	0.62	<8.48	0.66	<1.91	<6.43	109.2	<0.08
7204-5001	D	<0.02	0.04	1.1	<0.1	<3.7	1.8	<1	<2.4	<31.5	<0.04
7204-5001		<0.04	0.08	<1	<0.3	<9	[illegible]	<2.3	<5.3	<70.7	<0.1
7204-5004		<0.05	0.06	1.7	<0.3	<8	1	<2.6	<7.6	<68	<0.09
7204-5008	D	<0.02	<0.02	1.35	<0.16	<3.87	0.66	<0.78	<3.57	<154.6	<0.04
7204-5008		<0.06	<0.05	1.1	<0.4	<9.6	0.8	<2.6	<10.2	<94	<0.2
7204-5012		<0.05	0.04	<0.9	<0.3	<7.3	0.6	<1.8	<6.1	<60.1	<0.07
7205-5004		<0.02	0.06	0.49	<0.13	<3.23	<3.1	<0.7	<3.1	<32.33	<0.03
7205-5008		<0.02	0.04	1.67	<0.17	<4.07	0.9	<0.75	<3.58	<38.67	<0.04
7205-5012		<0.02	0.02	1.26	<0.16	<3.9	0.75	<0.68	<3.[illegible]	<38.6	<0.04
7206-5001		<0.02	0.06	1.3	<0.13	<3.1	0.42	<0.71	<2.8	<33	<0.03
7206-5004		<0.02	0.06	1.2	<0.14	<3.2	0.39	<0.63	<2.6	<33	<0.03
7207-5001	D	<0.02	0.05	1.2	<0.13	<3.34	0.53	<0.64	<2.69	<27.52	<0.03
7207-5001		<0.02	0.06	1.45	<0.13	<3.84	0.58	<0.74	<3.19	<28.5	<0.04
7207-5004		<0.02	<0.01	1.14	<0.14	<3.17	0.41	<0.66	<2.47	<33.35	<0.03
7207-5008		<0.02	0.11	1.24	<0.14	<3.25	0.44	<0.64	<2.87	<30.52	<0.03
7207-5012		<0.02	0.02	1.49	<0.14	<3.7	0.92	<0.73	<2.46	<28.89	<0.04
7207-5016		<0.03	0.17	2.7	<0.38	<10.37	11.64	<1.62	<4.9	<79.47	<0.1[illegible]
7208-5001		<0.04	0.05	1.7	<0.2	<6.2	0.6	<1.4	<5.4	<68.5	<0.07
7208-5004		<0.04	0.04	1.8	<0.2	<6.7	0.5	<1.3	<6.2	<40.5	<0.05
7208-5008	D	<0.02	0.09	1.15	<0.15	<4.06	1.22	<0.74	<2.63	<32.54	<0.04
7208-5008		<0.04	0.08	1.7	<0.4	<9.4	1.1	<2.1	<5.2	<88.5	<0.1
7208-5012	D	<0.02	0.13	0.9	<0.1	<4	0.9	<0.5	0.7	<43.4	<0.04
7208-5012		<0.05	<0.1	<1.1	<0.4	<9.2	0.9	<2.3	<5.6	<85	<0.1
7209-5001		<0.02	<0.03	0.6	<0.2	<6	4.4	<0.8	0.6	<58	<0.06
7209-5004		<0.02	0.05	1.6	<0.2	<5.6	2	<1.3	<3	<46	<0.05
7209-5008		<0.02	0.04	1.21	<0.17	<4.03	0.72	<0.76	<2.99	<40.28	<0.04
7209-5012		<0.02	0.08	2	<0.2	<4.3	0.8	<1.2	<3.5	<48.6	<0.04
8501-5001		<0.02	<0.02	1.2	<0.1	<3	0.2	<0.8	<2.5	<28	<0.03
8501-5004		<0.02	<0.01	0.8	<0.1	<2.7	0.3	<0.6	<2.4	<28	<0.03
8501-5007		<0.02	<0.02	1.4	<0.2	<3.2	0.5	<0.7	<2.7	<27	<0.03
8502-5001		<0.01	<0.01	0.9	<0.09	<2.3	0.2	<0.7	<1.9	<25.4	<0.02
8502-5004		<0.02	<0.02	0.4	<0.1	<3	0.4	<0.6	0.4	<34.3	<0.03
8502-5007		<0.02	<0.02	1	<0.1	<2.8	0.39	<0.6	<2.8	<23	<0.03
8503-5001		<0.02	0.04	1.3	<0.1	<2.8	0.2	<0.6	<2.8	<25.4	<0.03
8503-5004		<0.02	<0.02	0.6	<0.09	<2.7	0.3	<0.8	<2.7	<26.9	<0.03