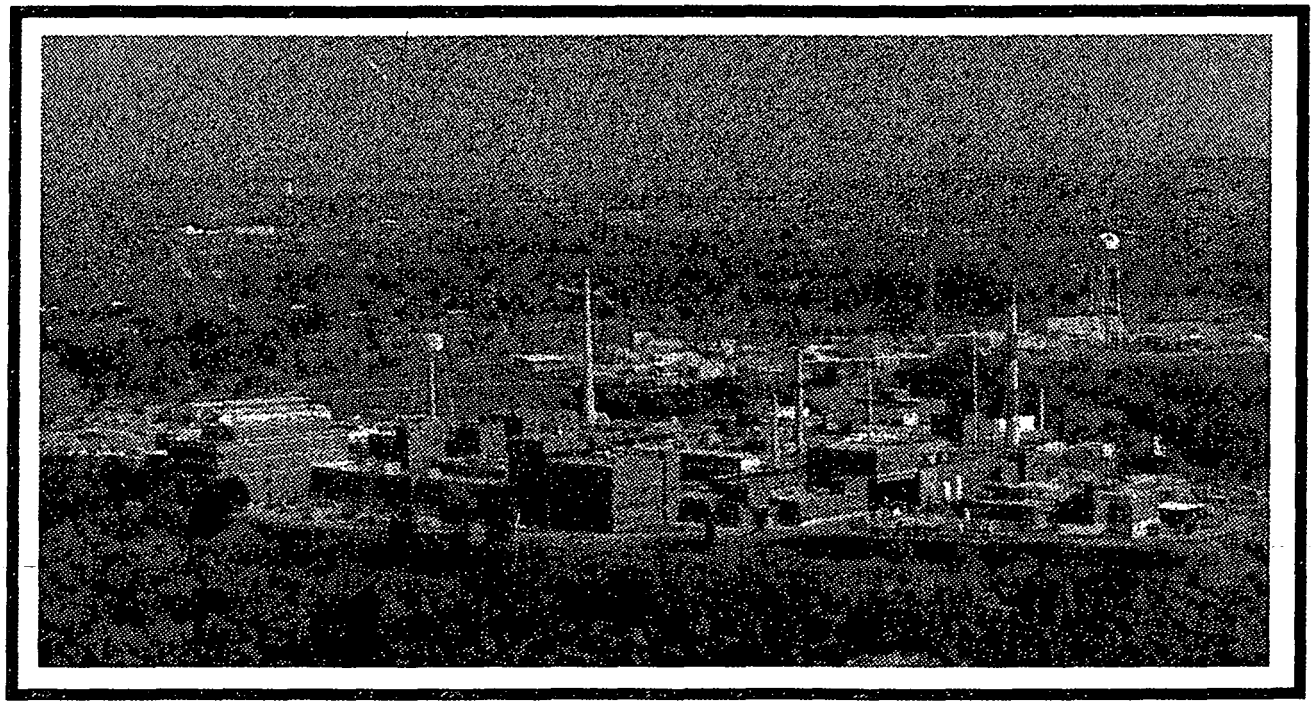
EG&G MOUND-30-03-04-02--9702030046

MOUND

Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 57



REV	DESCRIPTION	DATE
PUBLIC RELEASE **0**	Available for comment.	**Nov. 21, 1996**
FINAL **1**	Comment period expired. No comments. Recommendation page annotated.	Jan. 6, 1997

Miamisburg News
Miamisburg, OH
(W = 7,000)

MOUND

Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PACKAGE

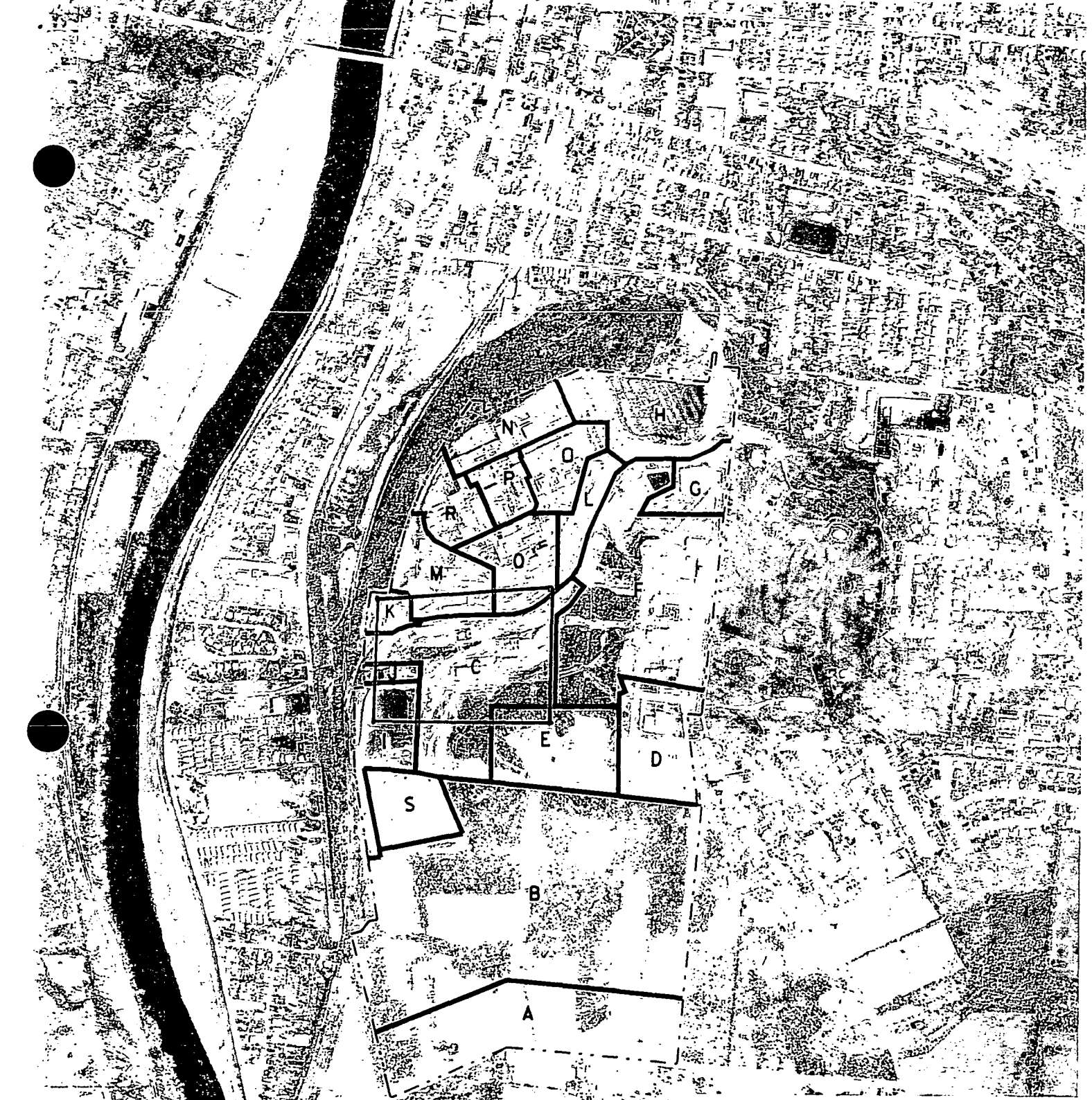
Notice of Public Review Period

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 November 29, 1996. Public comment will be accepted on these packages from November 29, 1996, through January 1, 1997.

PRS 37/399, 57, 58, 65/402/403/404, 75, 85, 86

Questions can be referred to Mound's Community Relations at (513) 865-4140.

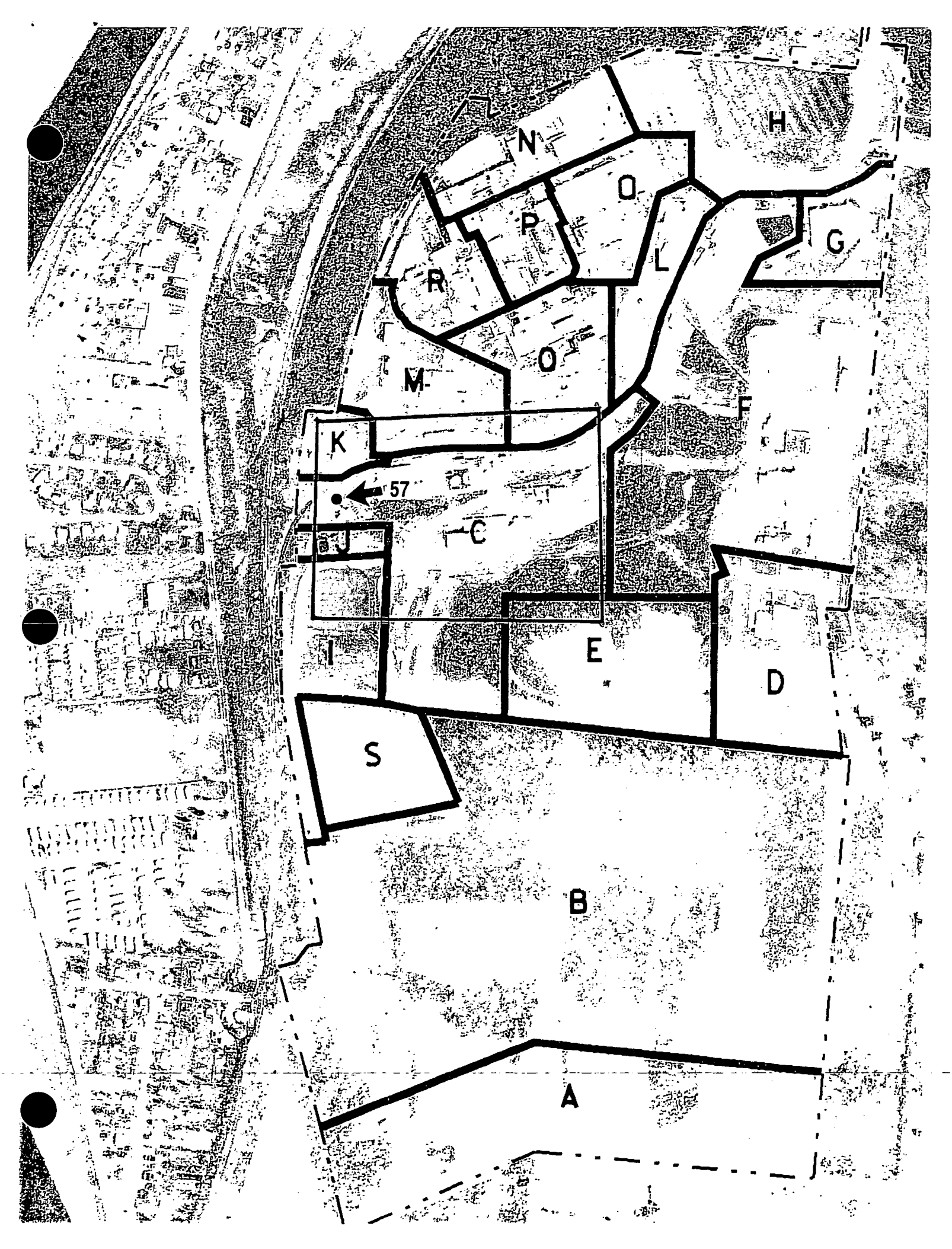


MOUND PLANT

Release Block C

Potential Release Site

PRS 57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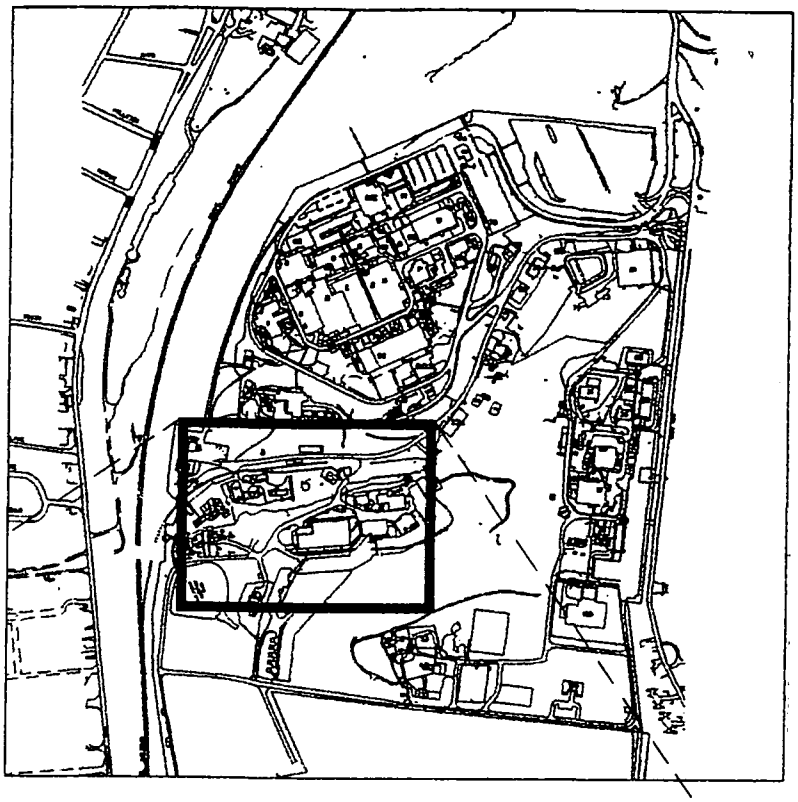
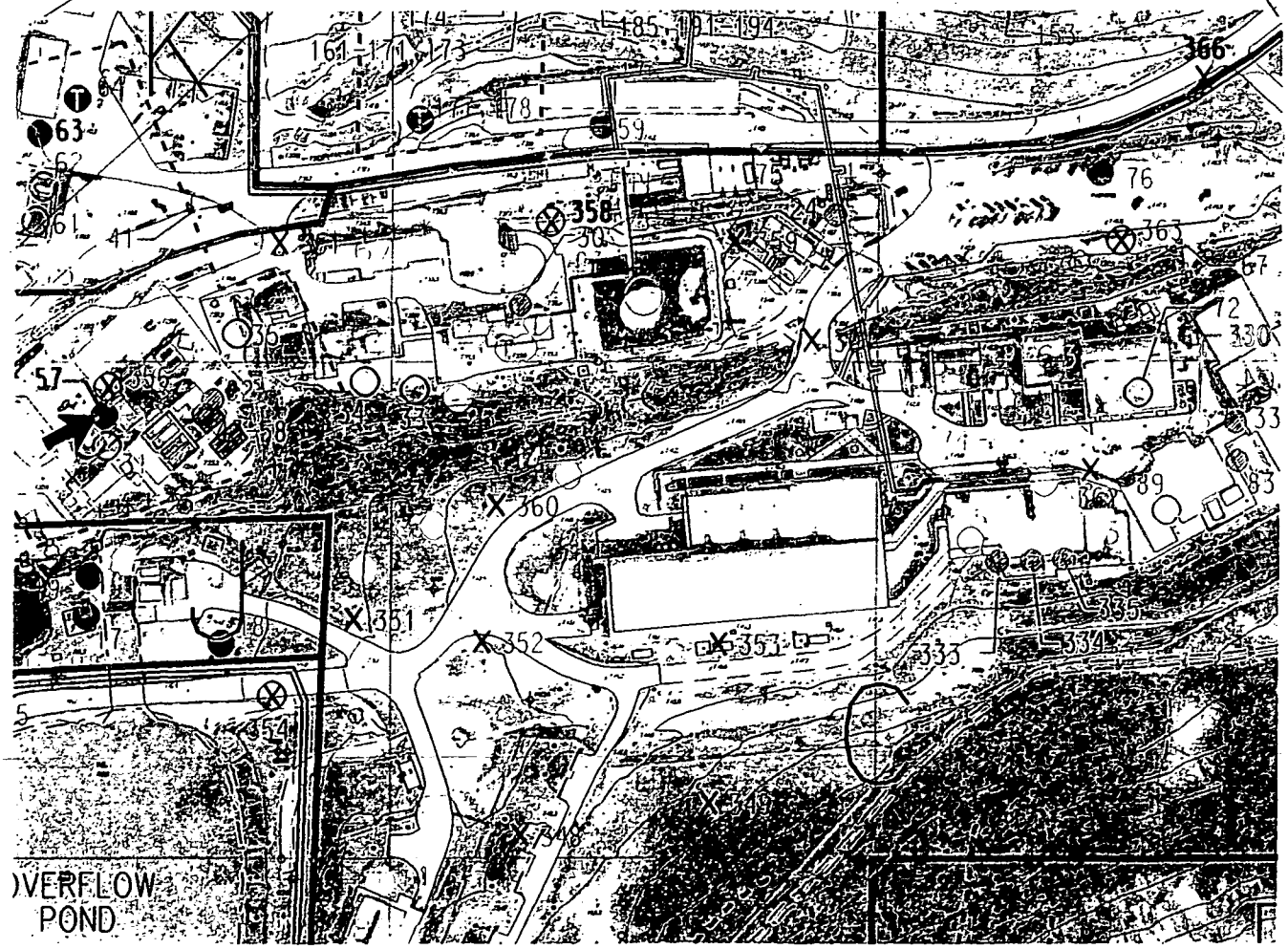
MOUND PLANT

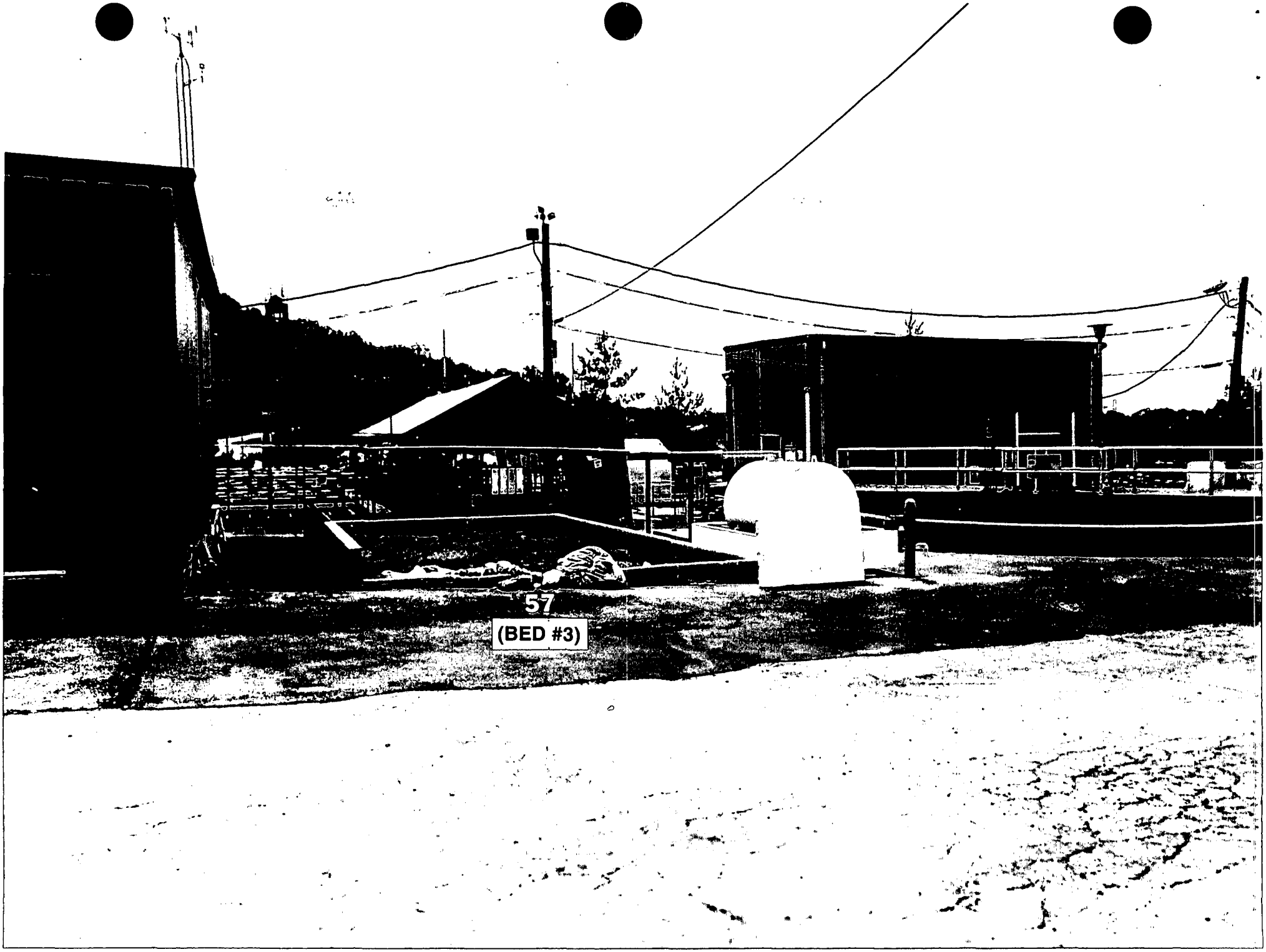
Release Block C

Potential Release Site

PRS 57



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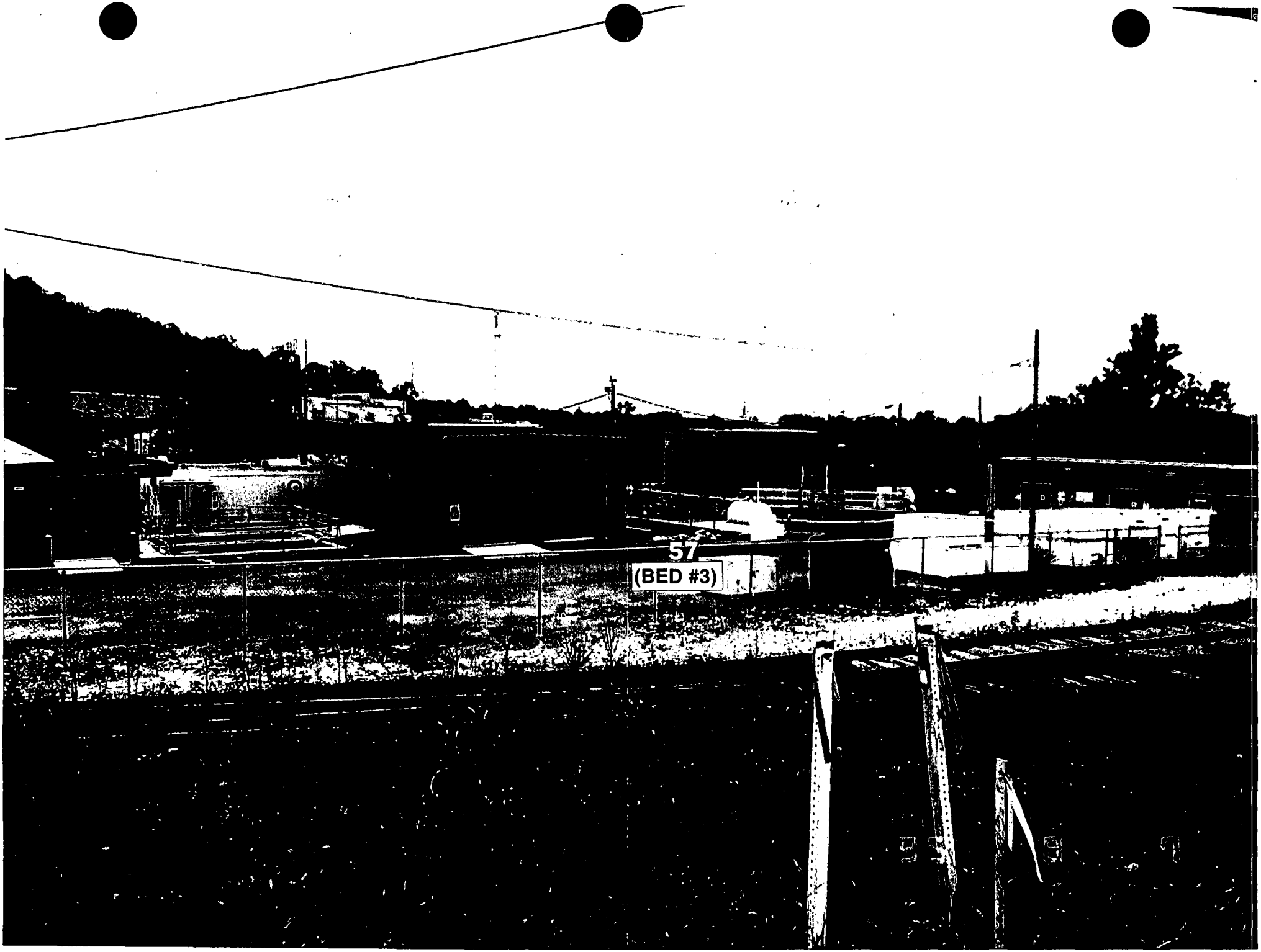
(BED #3)


57
(BED #3)

PRS 57

PRS HISTORY:

It is important to note that after careful review of ER documents referring to PRS#57, that the information and data presented is actually referring to two different PRS's. The majority of data that refers to PRS#57 is actually associated with PRS#41, Area 3, Thorium Drum Storage and Redrumming Area.[2] The four sludge drying beds located adjacent to building 57 in the SD area were identified as potential release sites by the Radiological Site Survey of 1993. Soil screening data obtained in 1988 from Health Physics coverage of the dismantlement of beds #1 and #2 indicated elevated levels of Plutonium-238 and Thorium-232 in the soils under the beds.[3] It is believed that the above contamination was present in the soils at the time the sludge beds were installed in 1974 and that it resulted from the historical use of Area #3 for storage and redrumming of thorium sludges. Therefore, this contamination is believed not to have been released from the sludge drying beds and that this contamination should be addressed as a separate issue under PRS#41. The sludges themselves did contain radionuclides, but did not have RCRA listed hazardous waste or hazardous waste characteristics.[5]

PROCESS DESCRIPTION:

The sludge drying beds received sludge and grit from the grit chamber and clarifiers in the sanitary disposal plant. Three perforated drainage pipes were partially embedded lengthwise in the bottom of each bed. Sand and gravel covered the pipes. Drainage water from sludge drying was collected by the pipes and added back into the wastewater influent upstream of the equalization basins. The sludge from the drying beds was managed as a radioactive waste and shipped to an off-site USDOE disposal location. In late 1989 or early 1990, beds #1 and #2 were removed and replaced with a filter press for removal of water from the sludge. Bed #4 was removed in 1991 to make room for a new clarifier. This leaves one sludge bed (#3) in place. The remaining bed is no longer being used as a sludge drying bed, but is still in service to rinse screens.[2]

CONTAMINATION:

The sludge contained radiionuclides, but did not have RCRA listed hazardous waste or hazardous waste characteristics.[5] Radiological analysis of SD sludge by wet chemistry method (Total Dissolution) indicated detectable levels of Pu-238, Pu-239, U-238, U-234, Th-228, Th-230, and Th-238, but not above action levels.[7]

READING ROOM REFERENCES:

1) Operable Unit 9 Site Scoping Report 12 - Site Summary Report, Dec 1994. (pages 6-8)
2) OU9, Site Scoping Report: Vol. 7 - Waste Management, February 1993. (pages 9-12)
3) OU9, Site Scoping Report, Vol. 3 - Radiological Site Survey, June 1993. (pages 13-17)
4) Sampling and Analysis Report, Mound OU5: Area 3, August 1993. (pages 18-48)
5) RCRA Facility Assessment Visual Site Inspection, USEPA Region V, May 1988. (pages 49-52)
6) Comprehensive Environmental Assessment and Response Program, Phase I: Installation Assessment Mound (Draft), April 1986. (pages 53-55)

OTHER REFERENCES:

7) "Special Analysis 1984 & 1985" Data. (pages 56-63)

PREPARED BY:

Dennis Gault, Member of EG&G Technical Staff

MOUND PLANT
PRS 57
WWTP TANK AREA - SLUDGE DRYING BEDS

RECOMMENDATION:

The sludge drying beds were identified as a potential release site, in 1988, when elevated levels of plutonium-238 at 1,235 pCi/g and thorium-232 at 63 pCi/g were measured during the construction project to remove the beds. Mound's ALARA (As Low As Reasonably Achievable) value for plutonium-238 is 25 pCi/g and for thorium is 5 pCi/g on the surface and 15 pCi/g below a depth of 15 cm. The elevated concentrations were not from the beds themselves, but from the soils under the beds after removal. Process knowledge indicates that the thorium contamination was in the soils beneath the SD sludge drying beds. The sludge drying beds never contributed contamination to the area. The contamination in the area came from and will be addressed under PRS 41, which is an area that includes PRS 57. Therefore, NO FURTHER ASSESSMENT is recommended for the sludge drying beds.

CONCURRENCE:

DOE/MB: Arthur W. Kleinrath, Remedial Project Manager — 11/21/96 (date)

USEPA: Timothy J. Fischer, Remedial Project Manager — 11/19/96 (date)

OEPA: Brian K. Nickel, Project Manager — 11/21/96 (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 11/29/96 to 01/01/97

☒ No comments were received during the comment period.

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

Page R

Support
Information
for
PRS 57

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

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
54	Building 57 Sand Filters (2 units)	(Cont.)	(Cont.)	(Cont.)	(Cont.)	(Cont.)	(Cont.)	(Cont.)	(Cont.)		
55	Building 57 Chlorine contact chamber (Tank 111)										
56	Building 57 Chlorine contact chamber (Tank 112)										
57	Sludge Drying Beds	H-5	Historical	Plutonium-238	4, 5, 18	Suspected	S	4	14	Table B.9	6
58	Dredge Spoil Drying Beds	H-5	Surplus	Contaminants listed under Asphalt-Lined Pond	4, 5, 18	Suspected	S	4	No Data		
59	Contaminated Soil Box Storage Area	G-6	Historical	Plutonium-238	4, 5, 18	Suspected			14	Table B.9	6
60	Hazardous Waste Storage Area (Building 72)	G-5	In service	Combustible and flammable liquids, Waste oils, Solvent-containing wastes, Ignitable wastes, Plating wastes, Photo-processing wastes, Polymeric wastes, Toxic wastes	4, 5, 18	None Suspected			1 14	SGS[b] Table B.5 Locations 5221 and 5222 Table B.9 RSS[c] Location C0103 (Appendix E in Ref. 6)	12 6
61	Building 72 Outdoor Hazardous Waste Storage Area		Inactive	Waste oils	4, 5, 18				1 14	SGS[b] Table B.5 Locations 5221 and 5222 Table B.9 RSS[c] Location S0541 (Appendix E in Ref. 6)	12 6
	lding 72 Empty Drum Storage Area		In service	None suspected	4, 5, 18				1	SGS[b] Table B.5 Locations 5221 and 5222	12

				Operational Jurisdiction				Historic Activities			
No.	Site Name	Location	Status	Regulated Units	Regulatory Authority	Spill Response	SWMU	Evidence Of Release	Response Authority	Further Action Recommended	FFA OU
51	Building 57 Aeration Basin (Tank 108)	(Cont.)	(Cont.)	(Cont.)	(Cont.)	(Cont.)	SWMU	No	NA	OM	
52	Building 57 Clarifier (Tank 109)						SWMU	No	NA	OM	
53	Building 57 Clarifier (Tank 110)						SWMU	No	NA	OM	
54	Building 57 Sand Filters (2 units)						SWMU	No	NA	OM	
55	Building 57 Chlorine contact chamber (Tank 111)						SWMU	No	NA	OM	
56	Building 57 Chlorine contact chamber (Tank 112)						SWMU	No	NA	OM	
57	Sludge Drying Beds	H-5	Historical		NA		SWMU	Yes	CERCLA	Yes	5
58	Dredge Spoil Drying Beds	H-5	Surplus		NA		SWMU	Yes	CERCLA	Yes	5
59	Contaminated Soil Box Storage Area	G-6	Historical		NA			No	CERCLA	Yes	5
60	Hazardous Waste Storage Area (Building 72)	G-5	In service	HWMU included in Part B application	RCRA	RCRA	SWMU	No	NA	OM	
61	Building 72 Outdoor Hazardous Waste Storage Area		Inactive		RCRA	RCRA	SWMU	No	NA	OM	
62	Building 72 Empty Drum Storage Area		In service		RCRA	RCRA	SWMU	No	NA	OM	
63	Building 19 Soils	G-5	Grounds		AEA	AEA		Yes	CERCLA	Yes	5
64	Building 19 Historic Gasoline Tank (Tank 238)	G-5	Historical		NA			No	CERCLA	Yes	5
65	Building 61 Area, Former Heavy Equipment Area	E-10	Historical		AEA	AEA		Yes	CERCLA	Yes	5
66	Area 7, Thorium and Polonium Wastes	E-8 E-9 F-8 F-9	Historical		NA			Yes	AEA	Yes	5
67	Plant Drainage Ditch	F-4 F-5 F-6 F-7 F-8 G-4 G-5 G-6 G-7 G-8 H-4 H-5 H-6 H-7	Waters of the U.S.	Effluent permitted to discharge under NPDES (outfall 002)	CWA	AEA	SWMU	Yes	CERCLA	Yes	9
	Asphalt-Lined Pond	E-9	Waters of the U.S.				SWMU	No	CERCLA	Yes	9

Circulates

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

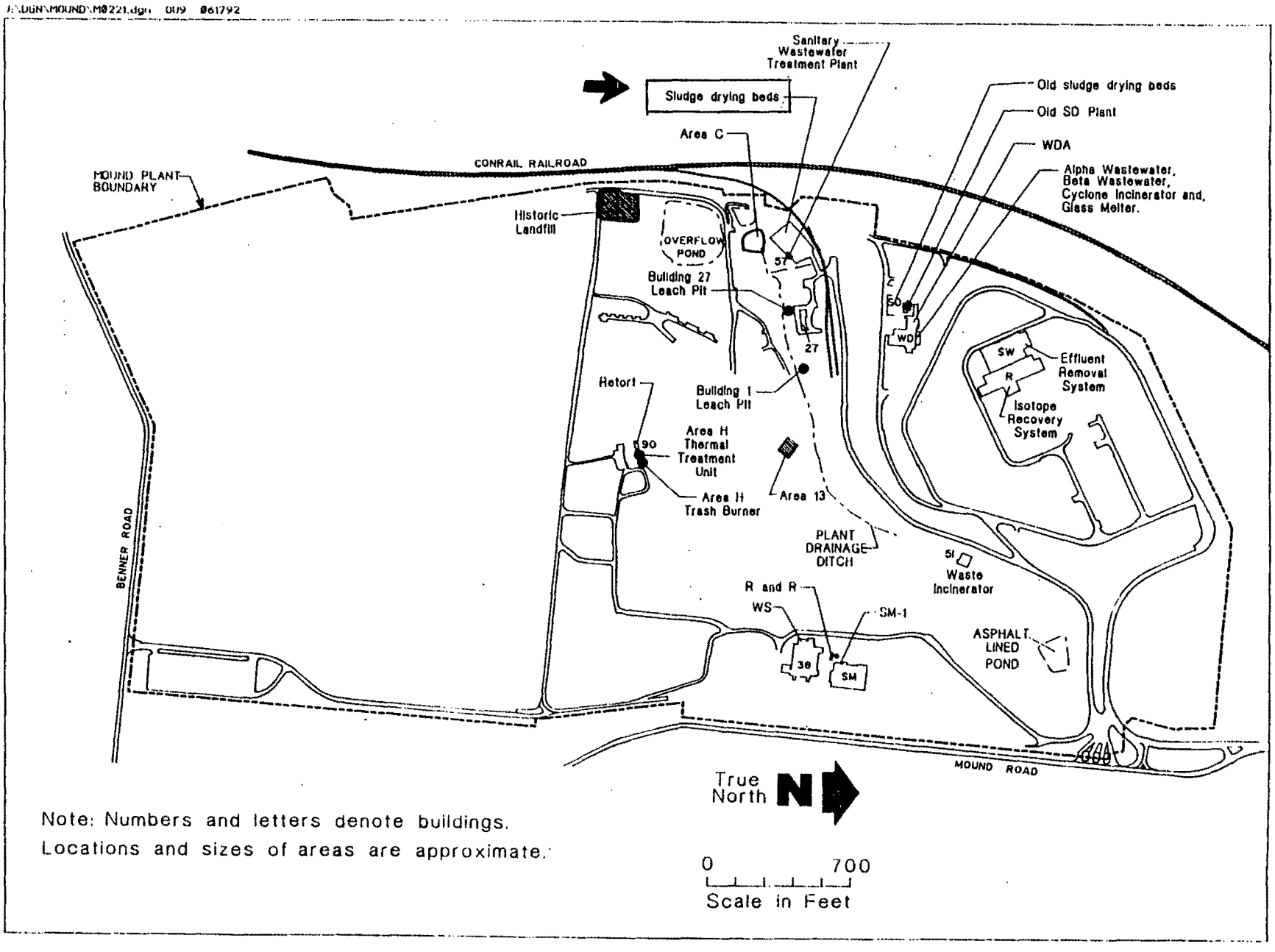


Figure 4.1 Waste treatment facilities.

they become loaded with solids. The backwash effluent is discharged to the communitor (Raker 1991). Filtered effluent is discharged to the chlorine contact chambers.

The two chlorine contact chambers are the final treatment step in the wastewater treatment plant. The chambers are outdoor units, rectangular, with open tops. The units are approximately 3 ft long by 3 ft wide by 10 ft deep. Chlorine is added to the wastewater in these units to disinfect them prior to discharge. Effluent from these units is discharged to the Great Miami River via NPDES Outfall 001. Flow measurement is performed using a Parshall flume. The sanitary sewage disposal plant began operating in 1975 and is still in use.

In addition to the units described above, the R Building sanitary waste collection tank and the Building 37 sanitary waste tank are associated with the sewage disposal plant. The R Building sanitary waste collection tank consists of a 500-gallon, unlined, stainless steel tank used to collect sanitary waste in the R Building. The tank was originally constructed because of a planned operation in the building that could have potentially caused the wastewater to become radioactively contaminated, had it been initiated. The tank was pumped to the SD Building for sanitary waste treatment (DOE 1991g). The Building 37 sanitary waste tank is a 500-gallon, unlined, steel tank that serves as a lift station for sanitary wastes received from Buildings 37 and 88. The wastes are then pumped to sanitary waste treatment facilities at the SD Building. Originally, this tank was placed to receive radioactively contaminated wastes; however, the tank never received them (DOE 1991b).

Historically, a sanitary septic tank located southwest of Building 30 served the SM Building. This tank is believed to have been constructed as a concrete vault, about 15 ft by 8 ft, but of unknown volume, that served the SM leach field downslope of the tank. Discharges to the tank took place from 1960 when it was built to 1964 when it was taken out of service and the sanitary sewer connected to the sewage disposal facility. Overflow of the alpha wastewater system in SM-1, described elsewhere, may have contributed plutonium contamination to the tank and leach field. The D&D of the SM leach field originally included the removal of the tank, but the tank could not be located when excavation started. The tank may have been removed during an earlier construction project in the area.

4.19.1. Sludge Drying Beds

The sludge drying beds are in the southwest area of the plant near Building 57 (Figure 4.1). They received sludge and grit from the grit chamber and clarifiers in the sanitary sewage disposal plant. The drying beds are approximately 40 ft long by 20 ft wide by 3 to 4 ft deep. The sides and walls of the beds are constructed of concrete. Three perforated drainage pipes are partially embedded lengthwise in the bottom of each bed. Sand and gravel covers the pipes. Drainage water from sludge drying was

collected by the perforated pipe and added back into the wastewater influent stream upstream of the equalization basins (Raker 1991). The sludge and grit placed in these beds was dried naturally and then removed from the beds and placed, with an absorbent, in large plywood boxes for shipment to an approved off-plant disposal facility. The dried sludge contained plutonium and other radionuclides but did not constitute a RCRA hazardous waste, nor did it have hazardous waste characteristics (EPA 1988).

Originally, there were four sludge drying beds. In late 1989 or early 1990, two of the beds were removed and replaced with a filter press for the removal of water from the sludge. The remaining two beds were scheduled to be dismantled in June and July 1991 (Raker 1991). The beds became operational in 1975 and were taken out of service when the filter press was installed.

4.20. OLD SEWAGE DISPOSAL FACILITY - SD BUILDING (HISTORICAL)

The old sanitary sewage disposal facility in the SD Building is just west of the WD Building and was first used in 1948 (Figure 4.1). It was taken out of service in 1975 when it became too small and was replaced by a new sanitary sewage disposal plant. The plant consisted of a pump room, primary settling tank, aeration tank, digester, chlorinator, and effluent baffle chamber. The system treated sanitary wastewater and some process effluent from the facility. Sources of wastewater included restrooms, showers, laundry facilities, lab sinks, and rinse water from a metal-finishing operation. All treatment units were open-topped, in-ground structures. The sidewalls and bottoms were in-ground structures constructed of 12-inch-thick reinforced concrete. The entire plant was approximately 44 ft long by 47 ft wide. Treated effluent was discharged to the Great Miami River through NPDES Outfall 001. The sludge from the treatment plant was routinely spread around various open field areas of Mound. The sludge was spread over the ground in the area around Building 87 and was dumped in piles in the area around Building 34, as well as over many grassy areas at the plant. In the 1960s, it was found that the sludge was slightly radioactive and open disposal was stopped. The sludge was then packaged for shipment to an approved off-plant disposal facility (Thomas 1991).

The area surrounding the old sewage disposal facility was contaminated with polonium and perhaps cobalt when a waste line broke near Building 48 in December 1970. The radioactive waste that leaked from the line cross-contaminated the sewage treatment process, causing the destruction of the bacterial population. To accommodate the process flow that resulted from the interruption of the SD Plant, water and sludge were pumped into a pit dug to the west of the SD drying beds (DOE 1991c). Other debris, old pipes, etc., may have been added to the pit. Plutonium contamination is also present in this area from the 1969 rupture of the WTS pipeline from SM/PP to WD Buildings.

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

FOR CI

4.1.10. Building 66 Lot Site

A note in the Site Survey Project Report (Table 2.1 in Stought et al. 1988) indicated that elevated levels of plutonium-238 were discovered in an area designated as Block 33. The area of concern is actually located adjacent to Building 66 just south of Building 51 along the upper reach of the plant drainage ditch (Plate 1). This area is referred to as the Building 66 lot site in this report. The Building 66 lot site is enclosed within the boundaries of Area 7 (Plate 1). Internal Mound Plant memoranda reviewed for this report substantiate the note in the project report (Stought et al. 1988) that plutonium-238 concentrations are as high as 7 nCi/g (MRC 1986). Plutonium-238 concentrations, however, ranged widely from less than 25 pCi/g to 7 nCi/g, suggesting very spotty contamination. The data report is included in Appendix E. The levels of plutonium-238 encountered required that the construction project be abandoned at the Building 66 lot site, so the initial holes were simply backfilled and the contamination left in place.

4.1.11. Locations With Elevated Plutonium-238

The evaluation of the Site Survey Project data for the compilation of this report indicated that three potential hot spots contained levels of plutonium-238 in excess of 25 pCi/g. These are all surface locations, numbered S0166, S0208, and S0706 on Table IV.9. These areas indicated plutonium-238 values of 34.5, 61.0, and 28.9 pCi/g, respectively. Surface location 0166 is located near the SW and R Buildings on the Main Hill; surface location 0208 is located northwest of the WD Building; and surface location 0706 is located north of the Area 1 runoff channel that goes west toward Area 2 (Plate 1). The Area 1 runoff channel is located in a ditch, and location 0706 is either on the embankment or in the woods above Area 1. The review of process history indicates that the elevated plutonium-238 activity in the three potential hot spot locations cannot be easily associated with process information. Areas 3, 4 and 4a, 7, 8, 12, and J also indicated elevated levels of plutonium-238. The elevated concentrations are not directly ascribed to process history, but may be due to spills, runoff, or other unknown processes. Descriptions of these areas are provided in companion sections of this report. Areas 3, 7, 8, and 12 are included in section 5; additional descriptions of Area 7 are provided in section 7; areas 4 and 4a are included in section 3; and Area J is described in section 10.

As with several hot spots and other local areas of contamination described in this report, elevated levels of plutonium-238 were discovered in Area 3 during routine surveys conducted during construction activities. The surveys of construction activities have been conducted routinely since 1985, required partly by the specifications for soil destined for the spoils disposal area. In August 1988, during survey of the dismantling of a portion of the sludge drying beds adjacent to the wastewater treatment facility, elevated levels of thorium and plutonium were indicated. An internal

memorandum indicates that analysis shows 15 samples from bed #3 possessing thorium concentrations that range from less than 1 to 63 pCi/g and plutonium-238 concentrations that range from less than 20 to 1,235 pCi/g (Collins 1988). Notes on the memo indicate that the samples were collected at the surface, but during interviews with the personnel that collected the samples, it was indicated that the samples were collected below the drying bed at the surface of the underlying soil. As part of the construction, the contaminated soil was removed and boxed for offsite disposal. Considerable doubt exists among the decontamination workers that any of the identified contamination actually contained plutonium-238. All of the radioactivity was assumed to be thorium-232, as it is apparent with as much thorium activity as was present in the drying beds, considerable interference occurs on the plutonium-238 channel of the analytical equipment. The 1,235 pCi/g of plutonium-238 were considered to have occurred by this interference. The data report is included in Appendix E. Soil was removed to a level approximating 15 pCi/g thorium according to field screening with a FIDLER. No additional soil samples were taken before the area was backfilled.

Considering that Area 3 was historically used for storage and redrumming of the thorium sludges, it is entirely consistent that the contamination identified in the sludge drying beds was thorium-232. Descriptions of Area 3 are provided in subsection 5.4. No processes, other than perhaps runoff from Area 14, could account for plutonium-238 under the sludge drying beds. The drying beds themselves were constructed in 1974 as part of the wastewater treatment plant. During that era, routine surveys did not accompany construction activities and the beds may have been built over soils contaminated with thorium.

SOIL SCREENIG FACILITY
Data Management System

CONT Sample's, taken by [redacted] 9542
DAILY REPORT FOR August 25,1988

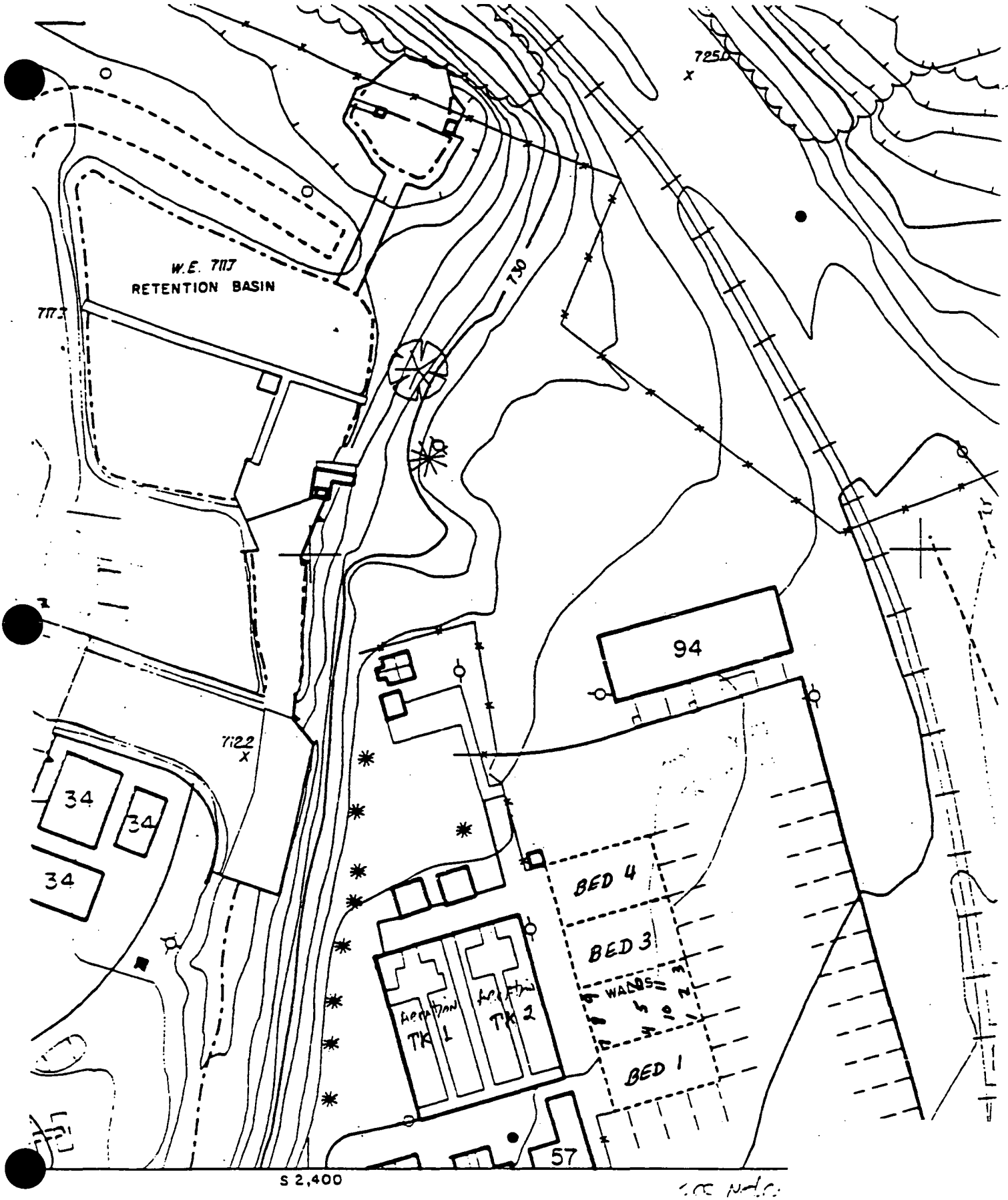
SAMPLE NUMBER	DATE SCREEN	SAMPLER	SAMPLE TYPE	TH 232 pCi/g	PU 238 pCi/g	GRID & SAMPLE LOCATION	WELL ID
1	8808251 : 08/25/88	[redacted] 9542	: CONT	22.1:	172:	#1 @ SURFACE W4275 X S2300 (BED	: A
2	8808252 : 08/25/88	[redacted] 9542	: CONT	13.2:	344:	#2 @ SURFACE W4275 X S2300 (BED	: B
3	8808253 : 08/25/88	[redacted] 9542	: CONT	8.6:	30:	#3 @ SURFACE W4275 X S2300 (BED	: C
4	8808254 : 08/25/88	[redacted] 9542	: CONT	17.8:	243:	#4 @ SURFACE W4275 X S2300 (BED	: A
5	8808255 : 08/25/88	[redacted] 9542	: CONT	2.1:	67:	#5 @ SURFACE W4275 X S2300 (BED	: B
6	8808256 : 08/25/88	[redacted] 9542	: CONT	0.8:	16:	#6 @ SURFACE W4275 X S2300 (BED	: C
7	8808257 : 08/25/88	[redacted] 9542	: CONT	63.0:	1235:	#7 @ SURFACE W4275 X S2300 (BED	: A
8	8808258 : 08/25/88	[redacted] 9542	: CONT	1.9:	78:	#8 @ SURFACE W4275 X S2300 (BED	: B
9	8808259 : 08/25/88	[redacted] 9542	: CONT	24.9:	111:	#9 @ SURFACE W4275 X S2300 (BED	: C
10	88082510 : 08/25/88	[redacted] 9542	: CONT	35.9:	992:	#10 @ SURFACE W4275 X S2300 (BED	: A
11	88082511 : 08/25/88	[redacted] 9542	: CONT	0.8:	45:	#11 @ SURFACE W4275 X S2300 (BED	: B
12	88082512 : 08/25/88	[redacted] 9542	: CONT	2.4:	20:	#12 @ SURFACE W4275 X S2300 (BED	: C
13	88082513 : 08/25/88	[redacted] 9542	: CONT	0.9:	0:	#13 @ SURFACE W4275 X S2300 (BED	: A
14	88082514 : 08/25/88	[redacted] 9542	: CONT	0.8:	39:	#14 @ SURFACE W4275 X S2300 (BED	: B
15	88082515 : 08/25/88	[redacted] 9542	: CONT	3.4:	23:	#15 @ SURFACE W4275 X S2300 (BED	: C

15 Samples taken from SD Bed #3, all samples were on surface, as indicated, and are marked accordingly on Map. In General, stronger readings seem to Be located in the Southwest corner, Additional samples may Be necessary, to determine how deep. It is assumed to contain mostly Th 232, and that some of this Th 232 Bled over into the Pu 238, causing higher reading from Pu 238 [redacted]

MOUND SOIL SCREEN DATA

[redacted] : TROY J. PEARSON III

ALL SOIL SAMPLE ARE RAN FOR 400 SEC UNLESS SPECI
THIS REPORT [redacted]



W4250X S2280

SAMPLES COLLECTED BY K. McMAHAN & J. DICKEY

NO DIALECT READINGS ON WALLS. FIDLER READINGS ON WALL- [redacted] BACKGROUN
FIDLER READINGS ON [redacted] SOIL - 50-100K C

SAMPLING AND ANALYSIS REPORT

MOUND OPERABLE UNIT 5

AREA 3

Prepared For

EG&G Mound Applied Technologies, Inc.

August 10, 1993

1.0 INTRODUCTION

EG&G Mound Applied Technologies and the Department of Energy (DOE) are planning construction inside Operable Unit 5, Area 3. Because this construction activity will hinder the DOE in its RI/FS for a portion of Area 3, it was necessary to evaluate the construction sites prior to beginning construction. This sampling and analysis plan report was prepared to document the results of the prior investigative activity for the proposed sites for permanent structures planned in Area 3.

Area 3 is located in the valley between the SM/PP Hill and the Main Hill at the southwest foot of the Main Hill. The area is approximately 250 ft. by 300 ft. (75,000 sq. ft.). Area 3 was used for the storage and redrumming of drum contents containing thorium and plutonium-238. Thorium contaminated soil was removed from Area 3 in 1965 and the site was backfilled with an undetermined amount of clean soil. Drums containing chemical wastes from various processing facilities at Mound Plant are also stored in and near Building 72 in Area 3, which is a RCRA-permitted facility.

The first proposed structure is a 70 ft. x 72 ft. building which is needed to support waste management operations. This building has been sited adjacent to existing Building 72. Locating the building here is desirable since both buildings will support related waste management functions.

The second set of structures are additions to the Mound Sanitary Treatment Plant. A new 34 ft. diameter clarifier, a 10 ft. x 10 ft. pump station, and a 22 ft. x 22 ft. sludge holding tank are proposed. These structures are sited among other Treatment Plant facilities and are required to ensure compliance with NPDES permits. Figure 1.1 shows the location of the proposed structures.

1.1 PURPOSE AND SCOPE OF THE SAMPLING ACTIVITY

The purpose of the sampling activity was to acquire representative data in order to verify the concentration of radiological and hazardous chemical compounds potentially present in the soils at the site of the proposed construction.

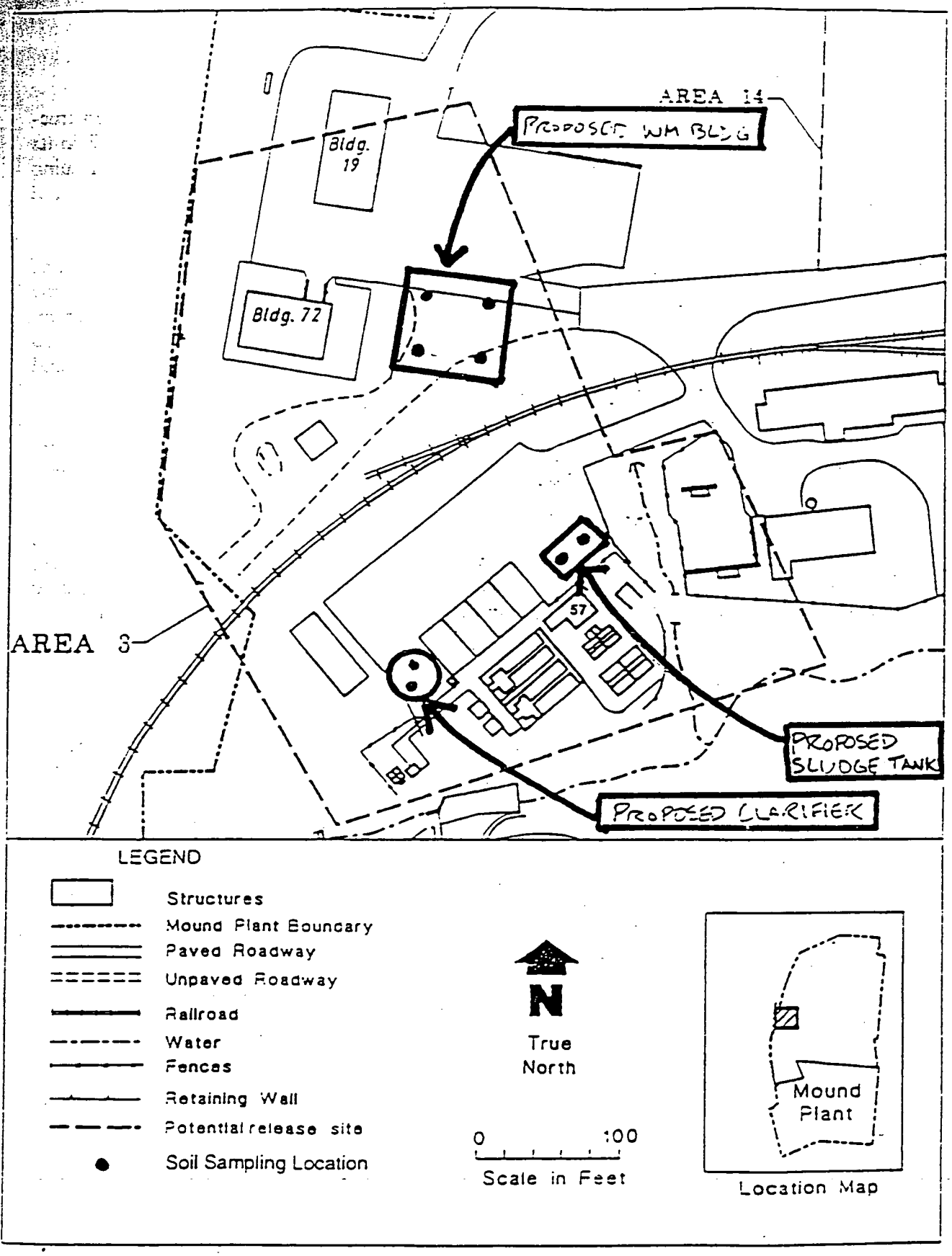
The scope of the sampling activity was to:

- Quantify the extent and magnitude of radiological contamination at the proposed construction site.
- Quantify the extent and magnitude of chemical contamination at the proposed construction sites.
- Provide data to assess the impacts to human health and the environment and to assess the impact to DOE's ability to conduct a thorough RI/FS in Area 3 if the structures are constructed.

1.2 SAMPLING ACTIVITY SUMMARY

Nine test borings were sampled for the characterization of the construction sites. Five sampling locations were situated below the future foundation of the Waste Management (WM) Building, two sampling locations were sited inside the foundation of the Clarifier and two sampling locations were

Figure 1.1 - Location of Construction Sites.



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sited inside the foundations of the sludge tanks. Figure 1.2 illustrates the sampling locations. Attachment 1 - Presents the surveyor's report of the sampling location.

At all locations, samples were taken at the surface and at 5 foot intervals. A six inch deep sample was obtained at the surface. The borehole was advanced to five feet deep and a two foot core sample was obtained. This scheme was followed until a 15 foot depth was reached. Attachment 2 presents this sampling rationale and boring log reports. All surface and subsurface soil samples were analyzed for the Mound Plant list of potential contaminants of concern which is presented in Table 1.

1.3 DATA SUMMARY

The following section describes the results of the sampling analysis and is presented by class of chemical constituent. The data tables are presented only for detected constituents and the tables are reflective of unvalidated data for radiologicals and volatiles.

Explosives

- Results for all samples in each area are reported as non-detect.

Radiologicals

- The results for the detected values are summarized in Table 2. Results for all samples in each area (Tables 3,4,5) are below the proposed Mound cleanup level for radiologicals. Therefore, concentrations are not expected to be of concern.

Semivolatiles

- The results for the detected values are summarized in Table 6. There are currently no ARAR's such as Maximum Contaminant Level (MCL) values or RCRA cleanup levels for data comparison. It is currently customary to compare detected results to a threshold value for polynuclear aromatic hydrocarbons (PAH's) of 330 ug/kg. Concentrations below 330 ug/kg are generally not of concern. As can be seen from Table 6, several PAH values exceed this level for surface soils. The boring logs (Attachment 1) indicate that surface soil samples were obtained through an asphalt boring. The Naphthalene, benzo(a)pyrene, and other PAHs have most likely leached from surface asphalt. A risk assessment would be necessary to confirm the levels of concern for these constituents.

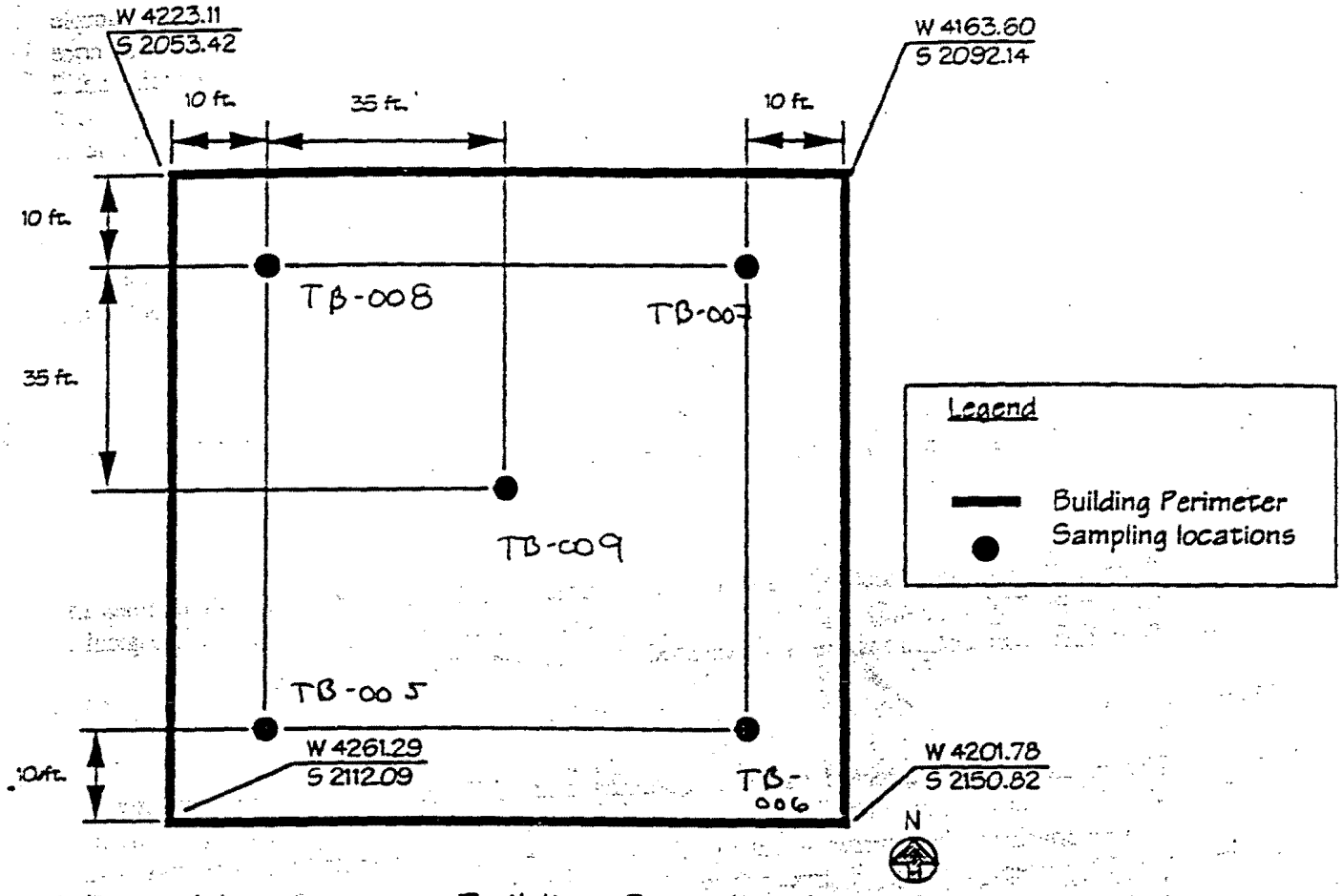
Inorganics

- The results for the detected values are summarized in Table 7. Results for all samples in each area (Tables 8, 9, 10) are below the RCRA cleanup levels (Table 12) and are within reasonable expectations of background conditions and do not appear to be of concern. Here again, a simple risk assessment would confirm the findings.

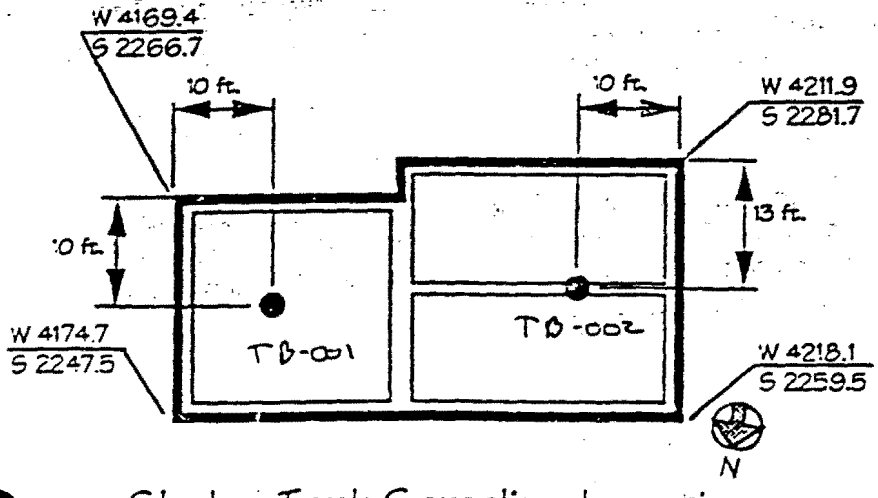
Volatile Organic Compounds

- The results for the detected values are summarized in Table 11. Detected concentrations are extremely low and are not expected to be of concern. Validated data will be used to confirm these findings. Results for all samples in each area are below the RCRA cleanup levels (Table 12).

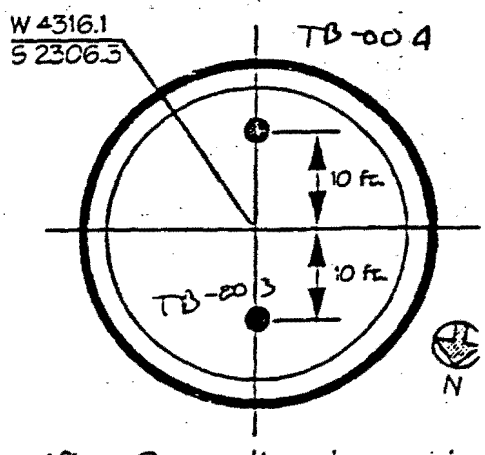
Figure 1.2 - Sampling Locations



Waste Management Building Sampling Locations



Sludge Tank Sampling Locations



Clarifier Sampling Locatic

Table 1 - Mound Plant Potential Contaminants of Concern

Compound	Compound
Acetone	Antimony
Acetonitrile	Beryllium
Acrylonitrile	Bismuth
Ammonia	Cadmium
ANCO ALGAECIDE No. 1 (2-benzyl-4-chlorophenol) [a]	Chromium
ANCOOL 3310 (triazole) sodium molybdate[a,b]	Cobalt
Arsenic	Cyanide
Benzene	Copper
Calcium	Iron
Carbon disulfide	Lead
Carbon tetrachloride	Lithium
Chloroform	Magnesium
Cresols (methylphenol)	Manganese
Diethyl benzene	Mercury
Fluoride	Nickel
Freon-TF (Freon 113, trichlorotrifluoroethane)	Selenium
Hexane	Silver
High explosives	Vanadium
PETN	Zinc
RDX	Actinium-227
HMX	Americium-241
Iodomethane	Bismuth-207
Methylene chloride	Bismuth-210m
Methyl ethyl ketone (2-butanone)	Cesium-137
Methyl isobutyl ketone (4-methyl-2-pentanone)	Cobalt-60
NALCO 2532 bis(tributyltin) oxide[a]	Plutonium-238,239/240
PCBs	Radium-226
Phenol	Strontium-90
Potassium	Thorium-228, 230, 232
Sodium	Tritium
Tetrachloroethane	Uranium-234/235, 238
Toluene	Rare earths (lanthanides)
Tribromomethane (bromoform)	Nitrate-nitrite
Trichloroethane	Nitrite
Trichloroethene	Chloride
Xylene	Sulfate
Aluminum	

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TABLE 2

Radiologicals Summary - Detects Only
(results in pCi/gr)

	Sample Boring											
Isotope	001 (S)	001 (5)	001 (10)	001 (15)	002 (S)	002 (5)	002 (10)	002 (15)	003 (S)	003 (5)	003 (10)	003 (15)
K-40	1.61	1.80	1.92	1.22	8.19	2.23	1.89	1.24	5.95	3.08	2.28	2.02
Ra-226	.842	1.03	1.48	1.06	.733	1.45	1.39	.975	.611	.979	.878	1.22
Pu-238	.080	U	U	U	.0739	U	.0311	U	.0266	U	.430	.943J
Pu-239/240	U	U	U	U	U	U	.0311	U	U	U	U	UJ
Th-228	2.32	.878	1.51	.674	.475J	.784	.891	.690J	.211	1.05J	1.18J	.946J
Th-230	.961	1.71	1.72	.917	.664J	1.08	1.26	1.04J	.712	.807J	1.31J	1.39J
Th-232	2.54	.753	1.71	.505	.396J	.856	.938	UJ	.233	1.32J	.995J	.998J
U-234	1.03	.639	.955	.717	.600	1.02	.841	.828	.466	.687	.953	.757
U-235/236	U	U	.0429	U	U	U	U	U	.0482	.0425	U	U
U-238	.929	.600	.891	.649	.574	.781	1.04	.761	.506	.701	.891	.879
Sr-90	U	U	.876	1.14	U	.535	.507	U	U	U	1.38	U
H-3	.199	2.93	1.92	.613	.270	2.73	1.73	.911	.0680	5.62	2.88	2.41

U = Indicates that the analyte is not detected
J = Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

RADIOCHEMICAL ANALYSIS

TABLE 2 (Continued)

Radiologicals Summary - Detects Only
(results in pCi/gr)

	Sample Boring											
Isotope	004 (S)	004 (5)	004 (10)	004 (15)		005 (S)	005 (5)	005 (10)				
K-40	6.22	2.24	1.97	2.17		1.37	2.05	1.43				
Ra-226	.599	1.03	1.16	1.10		.906	1.33	.844				
Pu-238	.0143	.0219	.308	.050		.255	.0121	U				
Pu-239/240	.0716	U	.0203	U		-	.0162	U				
Th-228	.0957	.560J	.834	1.04		.452	.949	.561J				
Th-230	.447	.852J	1.04	1.02		.711	1.10	1.09J				
Th-232	.131	.757	.872	.96		.462	.597	.570				
U-234	.477	.745	.617	.87		.793	.939	.703				
U-235/236	U	U	.0372	.052		.0597	.0678	.0592				
U-238	.535	.724	.803	.890		.462	.998	.802				
Sr-90	U	U	U	U		U	U	U				
H-3	.068	1.39	1.53	1.61		.502	.820	1.13				

U = Indicates that the analyte is not detected
J = Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

RADIOCHEMICAL ANALYSIS

TABLE 3

Radiologicals Summary by Area - Sludge Tank
(results in piCi/gr)

Isotope	$\bar{x}$ (001)	$\bar{x}$ (002)	$\bar{x}$ (Area)	#detects/ #Total	Det. Min.	Det. Max.
K-40	1.64	3.39	2.52	8/8	1.22	8.19
Ra-226	1.10	1.14	1.12	8/8	.733	1.48
Pu-238	.080	.053	.066	3/8	.0311	.080
Pu-239/240	U	.0311	.031	1/8	U	.0311
Th-228	1.35	.710	1.03	8/8	.475	2.32
Th-230	1.33	1.01	1.17	8/8	.664	1.72
Th-232	1.38	.730	1.06	7/8	.396	2.54
U-234	.835	.822	.830	8/8	.600	1.03
U-235/236	.0429	U	.043	1/8	U	.0429
U-238	.802	.789	.800	8/8	.574	1.04
Sr-90	1.01	.521	.766	4/8	.507	1.14
H-3	1.42	1.41	1.42	8/8	.199	2.93

U = Indicates that the analyte is not detected.

RADIOCHEMICAL ANALYSIS

TABLE 4

Radiologicals Summary by Area - Clarifier
(results in pCi/gr)

Isotope	$\bar{x}$ (003)	$\bar{x}$ (004)	$\bar{x}$ (Area)	#detects/ #Total	Det. Min.	Det. Max.
K-40	3.33	3.15	3.24	8/8	1.97	6.22
Ra-226	.922	.972	.947	8/8	.599	1.22
Pu-238	.467	.099	.283	7/8	.0143	.943
Pu-239/240	U	.046	.046	2/8	.0203	.0716
Th-228	.847	.632	.740	8/8	.0957	1.18
Th-230	1.05	.840	.945	8/8	.447	1.39
Th-232	.887	.680	.784	8/8	.131	1.32
U-234	.716	.670	.693	8/8	.447	.953
U-235/236	.045	.045	.045	4/8	.0372	.052
U-238	.744	.738	.741	8/8	.506	.891
Sr-90	1.38	U	1.38	1/8	U	1.38
H-3	2.75	1.15	1.95	8/8	.168	5.62

U = Indicates that the analyte is not detected.

RADIOCHEMICAL ANALYSIS

TABLE 6

SEMIVOLATILE DATA SUMMARY (detects only)
(results in ug/kg)

	001 (S)	001 (5)	001 (10)	001 (15)	002 (S)	002 (5)	002 (10)	002 (15)
Benzoic acid	51 J	U	U	U	38 J	50 J	U	U
Acenaphthylene	760	45	U	U	610	U	U	U
Dibenzofuran	58	U	U	U	U	U	U	U
Fluorene	140	U	U	U	U	U	U	U
Phenanthrene	780	210	U	160	120	U	U	U
Anthracene	420	46	U	U	240	U	U	U
Carbazole	63	U	U	U	U	U	U	U
Fluoranthene	2100	570	U	150	980	120	U	U
Pyrene	2000	510	U	120	1200	120	46	U
Benzo(a)anthracene	1500	330	U	58	770	87	U	U
Chrysene	1400	350	U	65	760	93	U	U
Bis(2-Ethylhexyl)Phthalate	48	U	U	43	49	66	65	47
Benzo(b)fluoranthene	U	270	U	U	1200	98	U	U
Benzo(k)fluoranthene	1800	310	U	51	1100	98	45	U
Benzo(a)pyrene	2100	320	U	U	1300	95	45	U
Ideno(1,2,3-cd)pyrene	1400	210	U	U	900	81	U	U
Dibenz Anthracene	480	94	U	U	300	U	U	U
Benzo Perylene	1300	210	U	U	910	92	U	U
Naphthalene	U	U	U	U	U	U	U	U
Di-n-octyl Phthalate	45	66	U	U	U	U	U	U
Di-n-butyl Phthalate	U	U	42	U	39	50	U	41

U = Indicates that the analyte is not detected.
J = Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

TABLE 6 (Continued)

SEMIVOLATILE DATA SUMMARY (detects only)
(results in ug/kg)

	003 (S)	003 (5)	003 (10)	003 (15)	004 (S)	004 (5)	004 (10)	004 (15)
Benzoic acid	U	U	U	U	42 J	U	U	U
Acenaphthylene	540	U	62	U	U	120	72	U
Dibenzofuran	65	U	U	U	140	U	U	U
Fluorene	79	U	U	U	120	U	U	U
Phenanthrene	570	U	85	U	1200	63	U	U
Anthracene	280	U	99	U	820	51	U	U
Carbazole	36	U	U	U	110	U	U	U
Fluoranthene	1500	U	260	U	2600	280	160	U
Pyrene	1500	U	260	U	2700	320	170	U
Benzo(a)anthracene	1100	U	170	U	2700	220	120	U
Chrysene	1000	U	220	U	2500	220	120	U
Bis(2-Ethylhexyl)Phthalate	U	U	54	U	U	48	65	U
Benzo(b)fluoranthene	1200	U	160	U	U	330	190	U
Benzo(k)fluoranthene	1200	U	190	U	3900	340	200	U
Benzo(a)pyrene	1300	U	190	U	4000	400	210	U
Ideno(1,2,3-cd)pyrene	820	U	110	U	2700	270	160	U
Dibenz Anthracene	280	U	U	U	1200	85	51	U
Benzo Perylene	810	U	100	U	2800	280	170	U
Naphthalene	71	U	67	U	180	U	U	U
)i-n-octyl Phthalate	U	U	U	U	U	U	U	U
)i-n-butyl Phthalate	U	U	U	U	U	U	U	U

J = Indicates that the analyte is not detected.
= Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

TABLE 7

INORGANIC DATA SUMMARY (detects only)
(results in mg/kg)

	001 (S)	001 (5)	001 (10)	001 (15)	002 (S)	002 (5)	002 (10)	002 (15)
Arsenic	1.3 L	6.6	4.5	2.3	3.1	4.7	6.2	5.0
Chromium	U	R	R	R	U	R	R	R
Lead	7.7 J	214 J	17.6 J	3.9 J	11.6	11.6 J	14.3 J	5.1 J
Nickel	U	15	25	16.5 L	20.2	20.2	U	11.8
Silver	U	4.8 J	8.7 J	U	6.8J	6.8 J	8.1 J	3.5 J

U = Indicates that the analyte is not detected.
L = Indicates results which fall between the instrument detection limit or the method detection limit and the practical quanititation limit. Results are considered estimates and are usable for limited purposes.
J = Results are considered estimates and are usable for limited purposes.
R = Results are rejected and data are unusable for all purposes.

TABLE 7 (Continued)

INORGANIC DATA SUMMARY (detects only)
(results in mg/kg)

	003 (S)	003 (5)	003 (10)	003 (15)	004 (S)	004 (5)	004 (10)	004 (15)
Arsenic	3.0	4.1	2.9	5.9	2.6	4.3	5.0	7.7
Chromium	U	R	R	R	U	R	R	R
Lead	9.2 J	7.2 J	6.7 J	13.4	3.3	9.2	11.3	10.7
Nickel	U	19.5	14.8	15.1	U	14.8	15.8	15.7
Silver	U	5.8 J	4.5 J	5.3 J	U	4.4 J	5.8 J	5.7 J

U = Indicates that the analyte is not detected.
L = Indicates results which fall between the instrument detection limit or the method detection limit and the practical quanititation limit. Results are considered estimates and are usable for limited purposes.
J = Results are considered estimates and are usable for limited purposes.
R = Results are rejected and data are unusable for all purposes.

TABLE 8

Inorganic Data Summary by Area - Sludge Tank*
(results in mg/kg)

	$\bar{x}$ (001)	$\bar{x}$ (002)	$\bar{x}$ (Area)	#detects/ #Total	Det. Min.	Det. Max.
Arsenic	3.68	4.75	4.22	8/8	1.3	6.6
Lead	60.80	10.33	35.57	8/8	3.5	214
Nickel	18.83	16.00	17.42	5/8	11.8	20.2
Silver	6.75	6.13	6.44	5/8	3.5	8.7

* Results for chromium are rejected based on data validation process.

General Chemistry

TABLE 9

Inorganic Data Summary by Area - Clarifier*
(results in mg/kg)

	$\bar{x}$ (003)	$\bar{x}$ (004)	$\bar{x}$ (Area)	#detects/ #Total	Det. Min.	Det. Max.
Arsenic	3.98	4.90	4.44	8/8	2.6	7.7
Lead	9.13	8.63	8.88	8/8	3.3	13.4
Nickel	16.47	15.43	15.95	6/8	14.8	19.5
Silver	5.20	5.30	5.25	6/8	4.4	5.8

* Results for chromium are rejected based on data validation process.

General Chemistry

TABLE 11

VOLATILE ORGANICS SUMMARY (detects only)
(results in ug/kg)

	001 (S)	001 (5)	001 (10)	001 (15)	002 (S)	002 (5)	002 (10)	002 (15)
Methylene Chloride	U	U	U	U	U	U	U	U
Acetone	UJ	U	UJ	UJ	U	UJ	UJ	UJ
2-Hexanone	UJ	U	U	U	U	U	U	U
Toluene	U	3J	2J	3J	U	4J	2J	2J
Xylenes	U	U	U	U	U	U	U	U
Hexane	U	U	U	U	U	U	U	U
2-Butanone	U	UJ	UJ	U	U	U	U	U

U = Indicates that the analyte is not detected.
J = Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

TABLE 11 (Continued)

VOLATILE ORGANICS SUMMARY (detects only)
(results in ug/kg)

	003 (S)	003 (5)	003 (10)	003 (15)	004 (S)	004 (5)	004 (10)	004 (15)
Methylene Chloride	U	U	U	U	U	U	U	U
Acetone	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
2-Hexanone	U	U	U	UJ	U	U	U	U
Toluene	1J	3J	3J	3J	U	U	5J	3J
Xylenes	U	U	U	U	U	U	U	U
Hexane	U	U	U	U	U	U	U	U
2-Butanone	U	U	U	UJ	UJ	U	UJ	UJ

U = Indicates that the analyte is not detected.
J = Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

TABLE 13

PCB and Pesticide Data Summary - Detects Only
(results in ug/kg; ppb)

	002 (S)	003 (S)	004 (S)	005 (S)
Endrin	4.6J	8.7J*	4.4J	U
Aroclor 1254	U	U	U	76

* = Average of duplicates
U = Nondetect
J = Results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable.

TABLE 14
INORGANIC DATA SUMMARY - LATHANIDE SERIES
DETECT ONLY (ERBIUM) - RESULTS IN mg/kg (ppm)

Boring # (depth)	Result	$\bar{x}$	Boring # (depth)	Result	$\bar{x}$
001 (S)	ND (detection limit = 37.9)		006 (S)	ND (detection limit = 37.3	
001 (5')	121.0		006 (5')	42.7	
001 (10')	186.0		006 (10')	33.9	
001 (15')	87.1	131.0	006 (15')	ND (detection limit = 37.3	38.3
002 (S)	67.8		007 (S)	39.6	
002 (5')	119.0		007 (5')	67.7	
002 (10')	162.0		007 (10')	75.5	
002 (15')	82.2	108.0	007 (15')	ND (detection limit = 37.3)	61.0
003 (S)	40.0 J		008 (S)	94.8	
003 (5')	63.7 J		008 (5')	86.2	
003 (10')	63.4 J		008 (10')	80.9	
003 (15')	131.0 J	74.3	008 (15')	ND (detection limit = 37.3)	87.3
004 (S)	54.7 J		009 (S)	43.0	
004 (5')	115.0 J		009 (5')	36.8	
004 (10')	138.0 J		009 (10')	80.4	
004 (15')	128.0 J	109.0	009 (15')	ND (detection limit = 37.3)	53.4
005 (S)	40.2				
005 (5')	97.5				
005 (10')	89.0				
005 (15')	ND (detection limit = 43.2	75.6			

ND = Non detect; J = Results are estimated and the data are valid for limited purposes.

mean ($\bar{x}$) erbium result sludge tank = 120.0 mg/kg
mean ($\bar{x}$) erbium result clarifier = 92.0 mg/kg
mean ($\bar{x}$) erbium result waste management unit = 79.0 mg/kg

General Chemistry

TABLE 15

Chloride, Fluoride, Nitrate/Nitrite, Sulfate, Total Organic Carbon and Explosives - Detects Only
(results in mg/kg)

	001(S)	001(5)	001(10)	001(15)	002(S)	002(5)	002(10)	002(15)
Chloride	2009	1534	162	103	1837	65	143	59
Fluoride	1.49	0.64	4.21	2.97	2.28	0.89	3.44	2.03
Nitrate	2.9J	1.26J	3.98J	1.1J	3.25J	2.12J	2.96J	1.13J
Sulfate	80.02	33	77	24	93	43	64	22.52
Total Organic Carbon	7520J	20164J	14068J	13238J	13924J	34825J	13174J	6060J

U = Indicates that the analyte is not detected.
J = Results are estimated and the data is valid for limited purposes. The results are qualitatively acceptable.

General Chemistry

TABLE 15 (Continued)

Chloride, Fluoride, Nitrate/Nitrite, Sulfate, Total Organic Carbon and Explosives - Detects Only
(results in mg/kg)

	003(S)	003(5)	003(10)	003(15)	004(S)	004(5)	004(10)	004(15)
Chloride	44	57	58	151	49	86	106	105
Fluoride	0.55	3.9	3.72	1.99	1.01	2.38	2.83	2.86
Nitrate	1.77J	2.35J	2.08J	2.16J	1.07J	2.35J	1.92J	2.16J
Sulfate	21.03	556	619	40	21.41	703	257	177
Total Organic Carbon	12332J	9612J	15225J	23244J	14789J	21448J	20302J	12880J

U = Indicates that the analyte is not detected.
J = Results are estimated and the data is valid for limited purposes. The results are qualitatively acceptable.

General Chemistry

APPENDIX A

SURVEY DATA

COLLINS-SADDLER & ASSOCIATES
CIVIL ENGINEERS-SURVEYORS
AERIAL SURVEYS
1599 NORTH CENTRAL DRIVE
DAYTON, OHIO 45432
(513) 426-8145

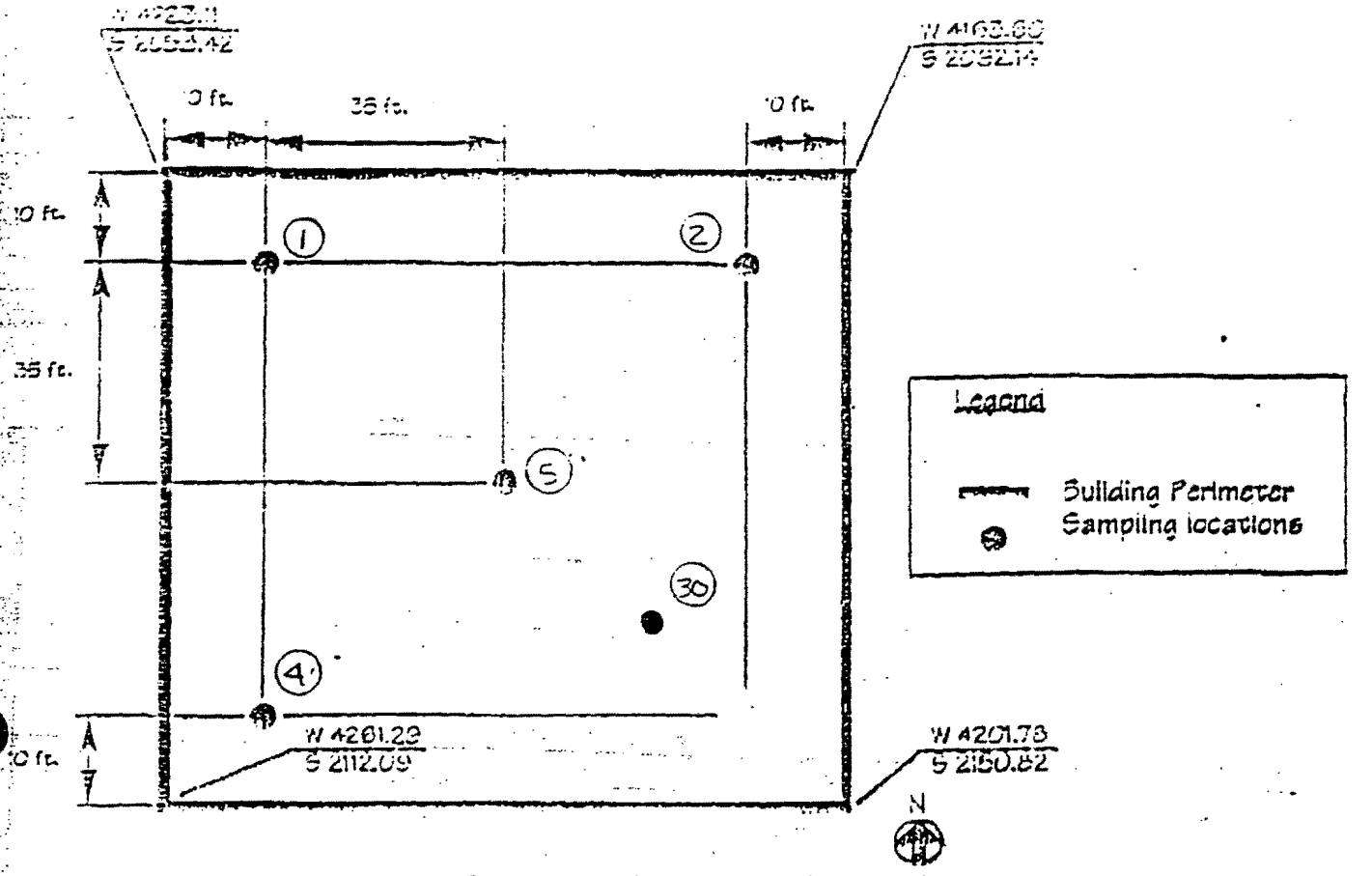
March 1, 1993

E.G. & G. MOUND, MIAMISBURG, OHIO
WASTE MANAGEMENT BUILDING SAMPLING LOCATIONS
PLANT COORDINATES

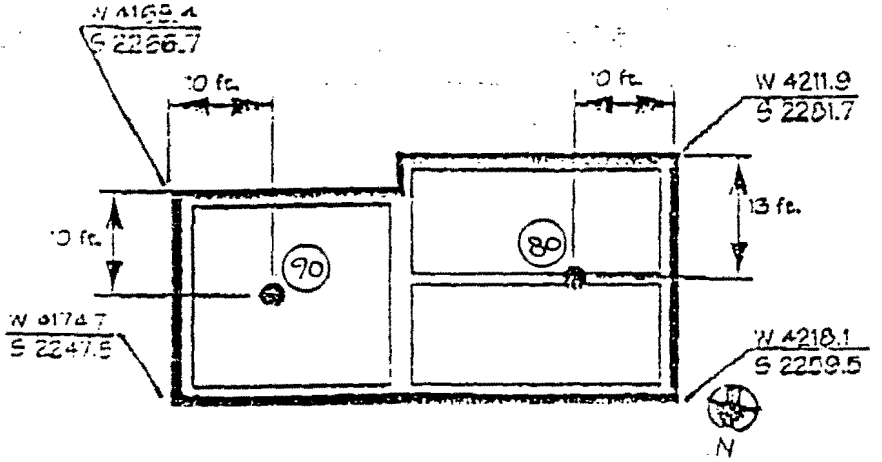
STATE PLANE COORDINATES

NUMBER	SOUTH	WEST	ELEVATION	LOCATION
1	2067.25	4220.18	742.52	Waste Management Bldg
2	2095.07	4177.43	744.09	Waste Management Bldg
30	2123.18	4207.77	742.41	Waste Management Bldg
4	2109.16	4247.46	740.55	Waste Management Bldg
5	2102.81	4212.30	742.62	Waste Management Bldg
6	2316.15	4314.36	727.07	Clarifier
7	2335.84	4310.89	727.54	Clarifier
80	2266.49	4205.77	729.65	Sludge Tank
90	2259.72	4181.70	730.18	Sludge Tank

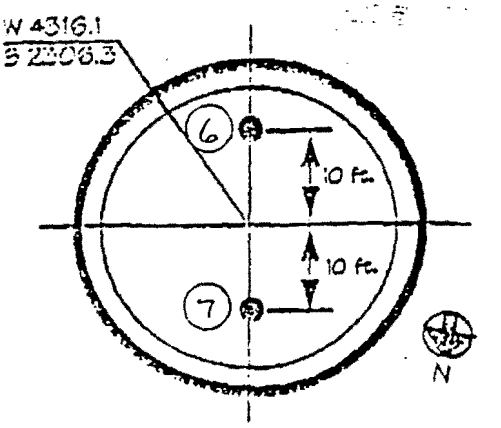
Figure 3-1. Sampling Locations



Waste Management Building Sampling Locations



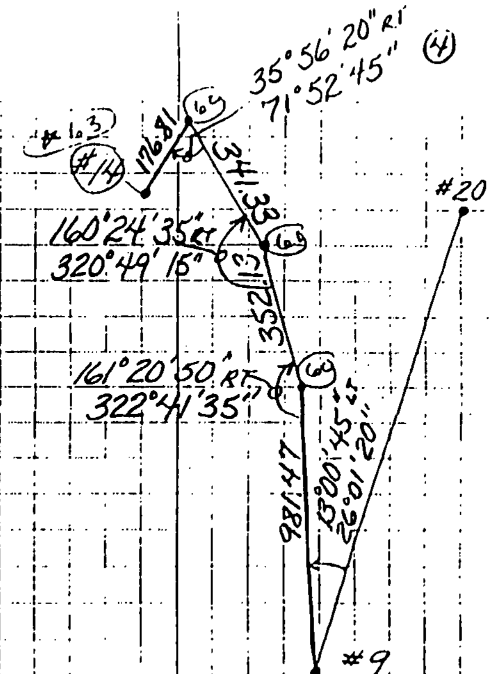
Sludge Tank Sampling Locations



Clarifier Sampling Locations

BM GS TK (2)

TBM	5.57	746.84		741.27	Mon #9		
1			4.32	742.52	Boring No	1	(ground)
2			2.75	744.09		2	
3			4.43	742.41		3	
4			6.29	740.55		4	
5	4.04	746.66	4.22	742.62		5	
	0.85	742.13	5.38	741.28	Mon No. 9		<741.27>
7	5.98	733.52	14.59	727.54	Boring No.	7	BT Pavement
6			6.45	727.07		6	
9 (9.5)	14.14	744.32	3.34	730.18		9	
8 (9.5)			14.67	729.68		8	
TBM			3.03	741.29	Mon	No 9	<741.27>



Traverse from Mon 20 to Mon 14

APPENDIX B

TEST BORING LOGS

ICF KAISER ENGINEERS — BORING LOG

PROJECT NAME: E&G Mound
PROJECT LOCATION: Miamisburg, OH
DRILLING FIRM: Bowser Morner, Inc.
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Bowser/Morner

WATER LEVELS RELATIVE TO G.SURFACE
DURING DRILLING: NA
WELL LEVEL: NA

NORTHING: 1495173.75
EASTING: 597683.75

BORING NO.: TB-001
G.S. ELEV.: 742.52
CASING ELEV.: NA
START DATE: 03/02/93
FINISH DATE: 03/02/93

DEPTH	S.S. SAMPLE	RECOVERY	BLOWS/FT.	PID (ppm)	SAMPLE DEPTH AND ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
						Asphalt		GP	
						Sand and Gravel, brown			
						Clay, black to gray, some rock, trace silt.		CL	
5		.6	10		TB-001-1A				5
			27						
		1.3	25		TB-001-2A	Clay, gray, trace silt.		CH	
			13						
			8						
			9						
10		1.5	13		TB-001-3A				10
			17						
			5						
			7						
			12						
15		1.9	13		TB-001-4A	Clay, brown, trace silt		CH	15
			18						
			19						
			22			End boring 17.0 ft			
			22						
			4						
20			5						20
25									25
30									30
35									35
40									

NOTES:

1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures

ICF KAISER ENGINEERS — BORING LOG

PROJECT NAME: EG&G Mound
PROJECT LOCATION: Miamisburg, OH
DRILLING FIRM: Bowser Morner, Inc.
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Bowser/Morner

WATER LEVELS RELATIVE TO G.SURFACE
DURING DRILLING: NA
WELL LEVEL: NA

NORTHING: 1495229.17
EASTING: 59676.06

BORING NO.: TB-002
G.S. ELEV.: 744.09
CASING ELEV.: NA
START DATE: 03/02/93
FINISH DATE: 03/02/93

DEPTH	S.S. SAMPLE	RECOVERY	BLOWS/FT.	PID (ppm)	SAMPLE DEPTH AND ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
						Asphalt		GP	
						Sand and Gravel, brown		GM	
						Weathered shale, black to gray, some limestone.			
5		1.5	8 10 13 18		TB-002-1A	Clay, gray, some silt.		CH	5
10		1.3	5 8 11 11		TB-002-2A				10
						Clay, brown, some silt		CH	
15			16 20 25 28		TB-002-3A				15
						End boring 17.0 ft			
20									20
25									25
30									30
35									35
40									40

NOTES:

1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures

ICF KAISER ENGINEERS

BORING LOG

PROJECT NAME EG&G Mound
PROJECT LOCATION Miamisburg, OH
DRILLING FIRM Bowser Morner, Inc.
DRILLING METHOD Hollow Stem Auger
LOGGED BY Bowser/Morner

WATER LEVELS RELATIVE TO G.SURFACE
DURING DRILLING NA
WELL LEVEL NA
NORTHING 1495229.17
EASTING 597637.94

BORING NO. TB-003
G.S. ELEV. 742.41
CASING ELEV. NA
START DATE 03/02/93
FINISH DATE 03/02/93

DEPTH	S.S. SAMPLE RECOVERY	BLOWS/FT.	PID (ppm)	SAMPLE DEPTH AND ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
					Asphalt			
					Sand and Gravel, brown		GP	
5	1.3	6 8 9 10		TB-003-1A	Clay, black to gray, some silt.		CH	5
10	1.5	16 10 13 9 12		TB-003-2A TB-003-3A	Clay, gray, some silt		CH	10
15	1.9	13 18 10 3 5 8 9		TB-003-4A	End boring 17.0 ft			15
20								20
25								25
30								30
35								35
40								

NOTES:

1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures

ICF KAISER ENGINEERS — BORING LOG

PROJECT NAME: EG&G Mound
PROJECT LOCATION: Miamisburg, OH
DRILLING FIRM: Bowser Morner, Inc.
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Bowser/Morner

WATER LEVELS RELATIVE TO G.SURFACE
DURING DRILLING: NA
WELL LEVEL: NA

NORTHING: 1495171.21
EASTING: 597634.32

BORING NO.: TB-004
G.S. ELEV.: 740.55
CASING ELEV.: NA
START DATE: 03/02/93
FINISH DATE: 03/02/93

DEPTH	S.S. SAMPLE	RECOVERY	BLOWS/FT.	PID (ppm)	SAMPLE DEPTH AND ID	MATERIAL DESCRIPTION	SYMBOL	REMARKS	DEPTH
						Asphalt			
						Sand, brown, and gravel, gray.		GP	
5		0	13		TB-004-1A	Clay, gray, some silt.			5
			19						
			26					CH	
			18						
10		.8	143		TB-004-2A	Clay, gray, some silt and limestone cobbles.			10
			57					CL	
			19						
			18			Clay, gray, some silt.			
15		.5	8		TB-004-3A				15
			13					CH	
		.5	18						
			19		TB-004-4A				
			16						
20			20			End boring 19.0 ft			20
			29						
			40						
25									25
30									30
35									35
40									40

NOTES:

1. Depths and Elevations in feet unless otherwise noted
2. USCS Classification based on visual-manual procedures

A.T. Kearney, Inc.
222 South Riverside Plaza
Chicago, Illinois 60606
312 648 0111

Management
Consultants

ATKEARNEY

April 13, 1988

Ms. Pat Vogtman
Regional Project Officer
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, Illinois 60604

Reference: EPA Contract No. 68-01-7374; Work Assignment No. R25-01-21; U.S. DOE Mound; Miamisburg, Ohio; EPA I.D. Number OH6890008984; Final PR Report and VSI Agenda/Information Needs Letter

Dear Ms. Vogtman:

Enclosed please find the Final PR Report and VSI Agenda/Information Needs Letter for the above-referenced facility.

If you have any questions, please feel free to call me or William Rohrer, the Work Assignment Manager, who can be reached at 612/227-6500.

Sincerely,

Ann L. Anderson

Ann L. Anderson
Assistant Technical Director

Enclosure (as stated)

cc: K. Lee, EPA Region V
J. Levin
J. Grieve
J. Gers (w/o attachment)
A. Williams (w/o attachment)
W. Rohrer, PRA

/alw
1461E

RCRA FACILITY ASSESSMENT
VISUAL SITE INSPECTION AGENDA

FACILITY: U.S. DOE Mound
Miamisburg, Ohio

EPA ID NO.: OH6890008984

FACILITY CONTACT: Dick Janowickie

DATES OF INSPECTION: May 3-6, 1988

PERSONNEL: Kae Lee, U.S. EPA Region V
W.L. Murphy Rohrer, Pope-Reid Associates, Inc.
S. Heikkila, Pope-Reid Associates, Inc.

PURPOSE OF THE VISUAL SITE INSPECTION

The Hazardous and Solid Waste Amendments of 1984 (HSWA) broaden the scope of EPA's authority under RCRA by requiring corrective action for releases of hazardous wastes and constituents at facilities that manage hazardous wastes. The authority requires corrective action for releases to the environment from any Solid Waste Management Unit (SWMU), including hazardous or non-hazardous wastes. The RCRA Facility Assessment includes a desk-top review of available file information of the facility, Visual Site Inspection (VSI), and, if necessary, a sampling visit. The preliminary review (PR) has been completed for this facility and a VSI has been determined to be necessary. The purpose of the VSI is to:

1. Confirm, by visual inspection, information collected during the PR;
2. Survey the site for additional SWMUs and other areas of concern, and identify potential sample points for possible future sampling activities; and
3. Review site information with facility representatives and collect additional information to address the information needs identified during the PR. Photographs are to be taken of all units and areas of concern.

Please note that the proposed agenda is based on information gathered during a desk-top review of the Ohio EPA files. Only units identified in the PR with

14. Unit Information:

A. Unit Name: Wastewater Treatment Plant

Capacity: 130,000 gallons/day (Ref. 23, p. 3-8).
Period of Operation: Unknown
Waste Type: Sanitary and industrial wastes (Ref. 53). The sludge contains radionuclides, but does not have RCRA-listed hazardous waste or hazardous waste characteristics (Ref. 55, p. V-5).
Hazardous Constituents: Unknown

Regulatory Status: NPDES permitted

B. Unit Description: The Wastewater Treatment Plant process consists of a grit chamber, comminutor, four equalization basins, two aeration tanks, two clarifiers and chlorination facilities (Ref. 53). After processing, the sludge is dried and packaged for off-site disposal and the effluent is discharged through an enclosed pipeline to the Great Miami River. Effluent quality is monitored continually to document compliance with their NPDES permit (Ref. 23, p. 3-13). Sources of wastewater treated at the facility include restrooms, showers, laundry facilities, lab sinks, and rinses from a small metal-finishing operation. An average of 100,000 gallons per day of treated effluent is discharged to the Great Miami River via Outfall 601 under NPDES permit No. IT000005 (Ref. 73). The capacity of the plant is 130,000 gallons/day (Ref. 23, p. 3-8). Ref. 55 (p. V-8) states that sludge contains radionuclides but does not have RCRA-listed hazardous wastes or hazardous characteristics. This unit is also referred to as Sanitary Disposal (SD) (Ref. 83, p.1).

Additional Information Needed:

1. Period of operation
2. Unit dimensions
3. Unit capacities
4. Release controls
5. Hazardous constituents
6. Waste flow description
7. Waste analysis which supports contention that there are no hazardous constituents in the waste

44. Harry N. Hill, Area Manager, DOE-Mound Facility, Letter to Donna Gorby Lee, Regional Air Pollution Control Agency, May 1, 1985.

45. James A. Morley, Area Manager, DOE - Mound Facility, Letter to Sandra Turner, Ohio EPA, July 15, 1985.

46. Sandra J. Kemper, Manager, Permits and Compliance Section, Ohio EPA, Transmittal of NPDES Permit to DOE-Mound Facility, September 30, 1985.

47. George Glaser, Alloyd Asbestos Abatement Company, Letter to Jack Kemp, Regional Air Pollution Control Agency, November 4, 1985.

48. Scott Shane, Ohio EPA, Potential Hazardous Waste Site Preliminary Assessment, December 9, 1985.

49. Glenn Statement Releasing the GAO Report on the Three Ohio Defense Facilities, December 17, 1985.

50. Mary L. Walker, Assistant Secretary, Environment, Safety, and Health, Department of Energy, Washington, D.C., Letter to Director, Ohio EPA, January 31, 1986.

51. James C. Simpson, Unit Supervisor, Water Pollution Control, Ohio EPA, Transmittal of NPDES Compliance Insepction Report to James Morley, DOE-Mound Facility, February 25, 1986.

52. Thomas G. Rigo, Manager, Field Operations Section, Division of Air Pollution Control, Ohio EPA, Transmittal of Permit to Install to Dave Ingle, DOE-Mound Facility, March 19, 1986.

53. Kendra H. Dearth, Industrial Wastewater Group, Ohio EPA, Report on Plans for Sand Filters at Sanitary Wastewater Treatment Plant to Serve U.S. DOE-Mound Facility, March 20, 1986.

54. Sandra J. Kemper, Permits and Compliance Programs, Ohio EPA, Transmittal of Permit to Install to DOE-Mound Facility, March 27, 1986.

55. Albuquerque Operations Office Environment, Safety, and Health Division, Environmental Programs Branch, Comprehensive Environmental Assessment and Response Program, Phase I, Installation Assessment Mound, Draft, April 1986.

56. James A. Morley, Area Manager, DOE-Mound Facility, Transmittal of Air Pollution Control Information to Larry F. Kertcher, U.S. EPA, Region V, April 24, 1986.

57. James A. Morley, Area Manager, DOE-Mound Facility, Transmittal of Reporting and Testing Requirements to Robert Phelps, Ohio EPA, May 15,

ALBUQUERQUE OPERATIONS OFFICE
ENVIRONMENT, SAFETY AND HEALTH DIVISION
ENVIRONMENTAL PROGRAMS BRANCH

COMPREHENSIVE ENVIRONMENTAL ASSESSMENT AND RESPONSE PROGRAM

PHASE I:
INSTALLATION ASSESSMENT
MOUND

NOT FOR PUBLIC DISSEMINATION

May contain unclassified controlled nuclear information subject to Section 148 of the AEA, as amended (42 USC 2168). Approval by the Department of Energy prior to release is required.

April 1986

DRAFT DRAFT DRAFT DRAFT DRAFT

storage (lead-acid) batteries, each weighing approximately 150 lbs, were returned to the manufacturer for reuse/recovery instead of being sent for disposal.

Efforts are continuing to reduce the volume of nonradioactive waste requiring off-site disposal by investigating the feasibility of sending some spent solvents for recycling, and reclaiming silver from photoprocessing wastes. The use of the onsite cyclone incinerator and glass melter is also being investigated to enhance waste volume reduction.

V.B.2. Existing Oil Storage Facilities. Number 2 fuel oil (backup supply for powerhouse) is stored in a 300,000-gal oil storage tank located just east of Building 27. In the event of an accident, the fuel storage tank could release No. 2 fuel oil into the environment (i.e., escape the diked containment area and flow down the stream channel to the Great Miami River). Recent USDOE AL audits have pointed out that a serious impact could result if a major spill were to occur. Because of the age of the fuel storage tank facility, the risk is considered high for such an occurrence. This risk is compounded by inadequate diking, which is incapable of containing 150% of the entire contents of the tank, and the containment liner requires continuing maintenance. The storage tank is also within an explosive storage area clearance ring. Additionally, other holding tanks for No. 2 fuel oil are located underground near the powerhouse and cannot be adequately monitored for leaks to the environment. A study is being conducted by MRC to evaluate relocation options for existing oil storage facilities. Tentative relocation sites have been identified.

Planned Future Actions: The oil storage facilities will be relocated. A containment dike will be placed around the relocated above-ground oil storage tank to contain the maximum accidental release. Additionally, the underground fuel oil holding tanks near the powerhouse will be placed above ground. The oil storage facilities will be constructed and operated in compliance with existing CWA (40 CFR 110 and 112) requirements and DOE Order 5480.1 Ch. XII Prevention, Control, and Abatement of Environmental Pollution.

V.B.3. Existing Waste Treatment and Disposal Facilities/Systems.

V.B.3.a. Sanitary Waste Treatment Facility. The activated sludge sanitary waste treatment facility that serves Mound has a capacity of 130,000 gal/day.

Treatment consists of aeration, sludge digestion, clarification, and chlorination. After processing, the sanitary sludge is air dried and packaged for offsite disposal. The sludge contains radionuclides, but does not have RCRA listed hazardous waste or hazardous waste characteristics. The sludge is being managed as a radioactive waste and shipped to an offiste USDOE disposal loction.

Sanitary waste treatment facility effluent discharges are discussed under the Clean Water Act, Sec. IV.D., and Operational Emissions and Environmental Monitoring, Sec. V.B.7.

Planned Future Actions: MRC will continue to manage the sanitary sudge as a radioactive waste.

V.B.3.b. Storm Runoff Treatment. Storm runoff at Mound is treated by settling suspended solids in the asphalt-lined pond, overflow pond, and a series of concrete basins to help ensure compliance with NPDES discharge limits. NPDES permit exceptions for total suspended solids due to storm runoff have been reported as required by the permit. Storm runoff discharges are discussed under the Clean Water Act, Sec. IV.D. and Operational Emissions and Environmental Monitoring, Sec. V.B.7.

The asphalt-lined pond is a storm water retention basin located between the Main Hill and the SM Hill (Fig. III.6.). The pond collects storm water runoff from the SM Hill. The pond also collects noncontact single-pass cooling water. Water from the pond is discharged to the onsite stream through a buried culvert. The pond was dredged in 1983 and the dredged material was shipped offsite for disposal as low-level radioactive waste.

The 5-million gal overflow pond, lined with a minimum of 3 ft of compacted clay, was constructed to hold a combination of runoff and effluents before release to the stream and the Great Miami River. The pond is located near the western boundary of Mound (Fig. III.6.). The pond is designed to store a 5-day supply should a spill or storm necessitate containment. The pond also functions as a sediment trap. The pond has never been dredged. Recent evaluation of the sediment retention capacity indicates no need to dredge at this time.

Near the western boundary of Mound, onsite streamflow is diverted through a series of interconnected concrete retention basins that regulate the rate and quality of discharge. During periods when the capacity of the concrete basins is exceeded, the stream-

H3 M… 2041
Cross… N 0…00…

Special
1984 & 1985

~~PLUTONIUM SOLIDS ANALYSIS RECORD~~

~~ON-SITE~~

2,25 … 242
500 … Pu

389
Special
analysis
1985

.026 …/ml

1.6 … 236

3123

From ______________________________ 19 ______

To ______________________________ 19 ______

RADIOCHEMICAL ANALYSIS

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION 8419182
2. SAMPLE LOCATION SD-Studsvik-Reel-1
3. DATE SUBMITTED
4. DATE ANALYZED
5. PROCEDURE TD (TOTAL DISSOLUTION)
6. VOLUME 1 gm
7. TRACER (Pu 242) d/min 5.33

```
SAMPLE NUMBER ?          :8419182        8/  28/  84
DETECTOR NUMBER ?        :17        ALL ERRORS ARE 2 SIG
TRACER COUNT  ?          :671       COUNTING ERROR ONLY
PU-238 COUNT ?           :2415
PU-239 COUNT ?           :105
COUNTING TIME ?          :1000
DETECTOR EFFICIENCY ?     0.2939
DIS/MIN OF THE SPIKE ?   :5.33

RECOVERY EFFICIENCY IS        0.4283    +OR-     0.0131

PICOCURIES OF PU-238 --       8.6411    +OR-     0.3517

PICOCURIES OF PU-239 --       0.3737    +OR-     0.0133
```

```
SAMPLE NUMBER            8418854          23 AUG 84
DETECTOR NUMBER           29          ALL ERRORS ARE 2 SIG
U-232 TRACER COUNT         383         COUNTING ERROR ONLY
U-238 COUNT               1185
U-234 COUNT               759
COUNTING TIME              1000 MIN.
TRACER LEVEL               1.98 DIS./MIN.

RECOVERY EFFICIENCY IS        .652833 + OR - .0667164

PICOCURIES OF U-238          2.75951 + OR - .160325

PICOCURIES OF U-234          1.76748 + OR - .128311
```

RADIOCHEMICAL ANALYSIS

MRC-ML-6943H

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION 84/9183-
2. SAMPLE LOCATION SD Sludge / Bed - b
3. DATE SUBMITTED
4. DATE ANALYZED
5. PROCEDURE Total - diss
6. VOLUME 1 gram
7. TRACER Pu-242 d/min 5.33
8. TECHNICIAN HDO

```
SAMPLE NUMBER ?          :8418183        8/  28/  84
DETECTOR NUMBER ?        :18       ALL ERRORS ARE 2 SIG
TRACER COUNT  ?          :320      COUNTING ERROR ONLY
PU-238 COUNT ?           :1397
PU-239 COUNT ?           :66
COUNTING TIME ?           1000
DETECTOR EFFICIENCY ?     0.2990
DIS/MIN OF THE SPIKE ?    5.33

RECOVERY EFFICIENCY IS        0.2008    +OR-     0.0224

PICOCURIES OF PU-238 --      10 4814    +OR-     0.5609

PICOCURIES OF PU-239 --       0.4952    +OR-     0.1219
```

```
SAMPLE NUMBER              8418855          23 AUG 84
DETECTOR NUMBER             30          ALL ERRORS ARE 2 S
U-232 TRACER COUNT          251          COUNTING ERROR ON
U-238 COUNT                 704
U-234 COUNT                 441
COUNTING TIME               1000 MIN.
TRACER LEVEL                1.98 DIS./MIN.

RECOVERY EFFICIENCY IS        .445581 + OR - .0562496

PICOCURIES OF U-234          2.50156 + OR - .188562

PICOCURIES OF U-238          1.56703 + OR - .149241
```

```
SAMPLE NUMBER              8418881          23 AUG 84
DETECTOR NUMBER             32          ALL ERRORS ARE 2 SIG
TH-229 TRACER COUNT          817          COUNTING ERROR ONLY
TH-228 COUNT                151
TH-230 COUNT                960
TH-232 COUNT                101
COUNTING TIME               1000 MIN.
TRACER LEVEL                5.51 DIS./MIN.

RECOVERY EFFICIENCY IS        .489683 + OR - .0342636

PICOCURIES OF TH-228          .458726 + OR - .0746612

PICOCURIES OF TH-230         2.84195 + OR - .185834

PICOCURIES OF TH-232          .30683 + OR - .0610615
```

RADIOCHEMICAL ANALYSIS

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION 8419184
2. SAMPLE LOCATION SD Sludge Bed-2
3. DATE SUBMITTED
4. DATE ANALYZED
5. PROCEDURE Leach
6. VOLUME 1 gm
7. TRACER Pu242 d/min 5.33
8. TECHNICIAN Hoo

DATA PRINTOUT:

```
SAMPLE NUMBER ?          8419184          0/ 28/ 84
DETECTOR NUMBER ?        19.        ALL ERRORS ARE 2 SI
TRACER COUNT  ?          636        COUNTING ERROR ONLY
PU-238 COUNT ?           3304
PU-239 COUNT ?           62
COUNTING TIME ?          1000
DETECTOR EFFICIENCY ?    0.3047
DIS/MIN OF THE SPIKE ?    5.33

RECOVERY EFFICIENCY IS        0.3916   +OR-     0.0311

PICOCURIES OF PU-239 --      12.4726   +OR-     3.4340

PICOCURIES OF PU-239 --       0.2340   +OR-     0.0594
```

RADIOCHEMICAL ANALYSIS

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION 8419185
2. SAMPLE LOCATION SD Sludge Bed - 2
3. DATE SUBMITTED
4. DATE ANALYZED
5. PROCEDURE Hexen
6. VOLUME 1 gm
7. TRACER Pu 242 d/min 533
8. TECHNICIAN

```
SAMPLE NUMBER ?          :8419184.8419185          8/  28
DETECTOR NUMBER ?        :20       ALL ERRORS ARE 2 SIG
TRACER COUNT ?           :525      COUNTING ERROR ONLY
PU-238 COUNT ?           :3480
PU-239 COUNT ?           :84
COUNTING TIME ?           1000
DETECTOR EFFICIENCY ?     0.2796
DIS/MIN OF THE SPIKE ?     5/.3

RECOVERY EFFICIENCY IS          0.3413    +OR-     0.0298

PICOCURIES OF PU-238 --        15.9145    +OR-     0.5396

PICOCURIES OF PU-239 --         0.3841    +OR-     0.0838
```

RADIOCHEMICAL ANALYSIS

Pond Blvd
Before col.

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION SD - Drying Beds
2. SAMPLE LOCATION SD. Beds
3. DATE SUBMITTED 7-18-85
4. DATE ANALYZED
5. PROCEDURE TD
6. VOLUME 1 gm
7. TRACER d/min
8. TECHNICIAN Hag

DATA PRINTOUT:

#1 The-U- start
#2 Three Before Plating

SAMPLE NUMBER	SD-1	23 JUL 85
DETECTOR NUMBER	46	ALL ERRORS ARE 2 SIGI
U-232 TRACER COUNT	584	COUNTING ERROR ONLY
U-238 COUNT	782	
U-234 COUNT	904	
COUNTING TIME	1000 MIN.	
DETECTOR EFFICIENCY IS	.2952	
TRACER LEVEL	2.69 DIS./MIN.	
RECOVERY EFFICIENCY IS	.735435 + OR - .060865	
PICOCURIES OF U-238	1.62098 + OR - .115988	
PICOCURIES OF U-234	1.8713 + OR - .124622	

SAMPLE NUMBER	SD-2	23 JUL 85
DETECTOR NUMBER	47	ALL ERRORS ARE 2 SIGI
U-232 TRACER COUNT	742	COUNTING ERROR ONLY
U-238 COUNT	677	
U-234 COUNT	1042	
COUNTING TIME	1000 MIN.	
DETECTOR EFFICIENCY IS	.3102	
TRACER LEVEL	2.69 DIS./MIN.	
RECOVERY EFFICIENCY IS	.889221 + OR - .0652887	
PICOCURIES OF U-238	1.10401 + OR - .0849209	
PICOCURIES OF U-234	1.69726 + OR - .105294	

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION SD- thy IWy Reds
2. SAMPLE LOCATION
3. DATE SUBMITTED
4. DATE ANALYZED
5. PROCEDURE
6. VOLUME 1g cm
7. TRACER d/min
8. TECHNICIAN HUP

DATA PRINTOUT:

SAMPLE NUMBER	SD-1	24 JUL 85
DETECTOR NUMBER	39	ALL ERRORS ARE 2 SIGMA
TH-229 TRACER COUNT	364	COUNTING ERROR ONLY
TH-228 COUNT	112	
TH-230 COUNT	99	
TH-232 COUNT	53	
COUNTING TIME	1000 MIN.	
DETECTOR EFFICIENCY IS	.3038	
TRACER LEVEL	5.51 DIS./MIN.	
RECOVERY EFFICIENCY IS	.217451 + OR - .0227951	
PICOCURIES OF TH-228	.763687 + OR - .144323	
PICOCURIES OF TH-230	.600585 + OR - .127987	
PICOCURIES OF TH-232	.361387 + OR - .0992808	

SAMPLE NUMBER	SD-2	24 JUL 85
DETECTOR NUMBER	40	ALL ERRORS ARE 2 SIGMA
TH-229 TRACER COUNT	409	COUNTING ERROR ONLY
TH-228 COUNT	112	
TH-230 COUNT	126	
TH-232 COUNT	30	
COUNTING TIME	1000 MIN.	
DETECTOR EFFICIENCY IS	.2873	
TRACER LEVEL	5.51 DIS./MIN.	
RECOVERY EFFICIENCY IS	.258366 + OR - .0255508	
PICOCURIES OF TH-228	.679663 + OR - .128444	
PICOCURIES OF TH-230	.690161 + OR - .129432	
PICOCURIES OF TH-232	.182052 + OR - .0664762	

MRC-ML-

RADIOCHEMICAL ANALYSIS

PLUTONIUM SOLIDS ANALYSIS RECORD

1. LABORATORY IDENTIFICATION SD-1
2. SAMPLE LOCATION SD-1-Drying
3. DATE SUBMITTED
4. DATE ANALYZED
5. PROCEDURE
6. VOLUME 1 gram
7. TRACER d/min
8. TECHNICIAN H O P

DATA PRINTOUT:

SAMPLE NUMBER	SD-1	24 JUL 85
DETECTOR NUMBER	37	ALL ERRORS ARE 2 SIGMA
PU-242 TRACER COUNT	845	COUNTING ERROR ONLY
PU-238 COUNT	3553	
PU-239 COUNT	203	
COUNTING TIME	1000 MIN.	
DETECTOR EFFICIENCY IS	.2788	
TRACER LEVEL	5.33 DIS./MIN.	
RECOVERY EFFICIENCY IS	.568639 + OR - .0391236	
PICOCURIES OF PU-238	10.0951 + OR - .338723	
PICOCURIES OF PU-239	.576785 + OR - .0809647	

SAMPLE NUMBER	SD-2	24 JUL 85
DETECTOR NUMBER	38	ALL ERRORS ARE 2 SIGMA
PU-242 TRACER COUNT	1139	COUNTING ERROR ONLY
PU-238 COUNT	4178	
PU-239 COUNT	152	
COUNTING TIME	1000 MIN.	
DETECTOR EFFICIENCY IS	.3105	
TRACER LEVEL	5.33 DIS./MIN.	
RECOVERY EFFICIENCY IS	.688232 + OR - .0407853	
PICOCURIES OF PU-238	8.80682 + OR - .272499	
PICOCURIES OF PU-239	.320401 + OR - .0519759	

RADIOCHEMICAL ANALYSIS

MRC-ML-6943H