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REMOVAL SITE EVALUATION PLANT 1 PAD CONTINUING RELEASE NOVEMBER 1990

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REMOVAL SITE EVALUATION

PLANT 1 PAD CONTINUING RELEASE

Feed Materials Production Center

U. S. Department of Energy

November 1990

REMOVAL SITE EVALUATION

PLANT 1 PAD CONTINUING RELEASE

INTRODUCTION

The Feed Materials Production Center (FMPC) is a uranium processing complex owned by the U.S. Department of Energy (DOE). The location of the 1050 acre site is shown in Figure 1. The FMPC was placed on the National Priorities List (NPL) in 1989. The DOE is conducting a remedial investigation and feasibility study (RI/FS) together with other response actions under a 1990 CERCLA Consent Agreement with the U.S. Environmental Protection Agency (EPA).

Since the early 1950's various chemical and metallurgical processes have been used to manufacture uranium products for the defense complex. The FMPC suspended these operations in July, 1989. A substantial quantity and variety of waste materials were generated during production operations, and much more will be generated during the remedial phase. Some of the current waste inventory contains radioactive materials, and some contains both radioactive and hazardous constituents, as defined under the Resource Conservation and Recovery Act (RCRA), as amended. It is expected that a large part of the waste materials generated during the remedial phase will also contain similar constituents.

The Plant 1 Pad and adjacent area comprises approximately 12 acres on the northwest side of the process area as shown in Figure 2. Plant 1 is the "sampling plant" for the FMPC and is therefore the location for sampling of large amounts of uranium metal process residues and waste materials. The concrete storage pad associated with Plant 1 has been used as a drum storage location to support these operations since 1952.

The current inventory of the pad is approximately 45,000 drums. A waste characterization study is underway to complete a hazardous waste determination on the contents of these individual drums. Drums known to contain hazardous wastes are being moved to more appropriate storage facilities.

As detailed later in this document, above background concentrations of uranium and thorium have been found in the Plant 1 Pad area, and surrounding soils. In addition, various hazardous constituents have also been detected.

This Removal Site Evaluation (RSE) was initiated by the DOE under authorities delegated to it under Section 104 of CERCLA, through Executive Order 12580. It is being conducted to determine whether the conditions present at the Plant 1 Pad warrant a removal action under CERCLA, consistent with Section 300.410 of the National Contingency Plan (NCP). Any response action taken will incorporate the substantive requirements of CERCLA, RCRA, and NEPA.

If a removal action is appropriate, the evaluation of response alternatives will take into consideration the long-term remedial action objectives for the Plant 1 Pad, which is part of Operable Unit 3 under the RI/FS. The removal action alternative chosen will contribute to the efficient performance of any anticipated long-term remedial action, to the extent practicable.

At present, the DOE is also taking actions on Plant 1 Pad area that are designed to comply with a proposed amended Consent Decree for RCRA, negotiated between the DOE and the State of Ohio. These activities include waste/material characterization, drum movements to achieve adequate aisle spacing, and daily/weekly drum inspections.

SOURCE TERM

General

There are existing areas of contamination on and around the Plant 1 Pad. The origin of this contamination includes the potential historical release of material from drums stored on the pad. Most of the carbon steel drums used to store materials on the pad have deteriorated as a result of exposure to the weather. There is a risk for continued releases from materials stored on the pad to the surrounding environment.

Materials containing varying amounts of uranium metal (ingots and scrap), UO_3 (reactor recycle tails), UF_4, U_3O_8 and thorium (ThF_4 and ThO_2 high fluoride), as well as drums of barium salts, waste oils contaminated with 1,1,1 trichloroethane, and lead have been stored on the pad.

Presently, there are several ways contaminants can enter the environment from releases from the Plant 1 Pad: rain water runoff penetrating cracks in the pad and entering the soils below; runoff that flows directly into the storm sewer system; and runoff which flows from the northwest side of the pad onto the adjacent soils. In addition, airborne releases of dried material can reach the environment.

The assumptions for exposure pathways include, but are not limited to, resuspension of radionuclides in the soils (inhalation), surface water runoff (the receptor could be wildlife) and infiltration to an underlying aquifer. This "buried valley" aquifer has been designated to be a "sole source aquifer" by the U.S.EPA under Section 1424(e) of the Safe Drinking Water Act. Migration/transportation of contaminants (from the Plant 1 Pad) into the aquifer has not been established, however, the possibility for vertical migration exists. Exposure to contaminants would occur only if the ground water reaches the surface and is used by individuals and/or wildlife (ingestion or irrigation).

Source Specific

Sampling on, through, and around the pad area is on-going. Available data indicate that elevated levels of thorium and uranium isotopes exist under the pad and in the surrounding soils, as well as above background levels of barium and lead. Discrete samples have also indicated the presence of target organics such as acetone, methylene chloride, carbon disulfide, and xylene in soils adjacent to the pad.

A) Runoff from the Pad

Limited sampling of the rainwater runoff from the Plant 1 Pad has been performed in the past. These data demonstrate that the Plant 1 Pad runoff contains elevated levels of uranium.

B) Contamination on the Pad

There has also been sampling of the pad materials in association with emergency repairs made to the pad (discussed under Controls in Place to Address Potential Threats). Complete analytical results of this sampling are not yet available. It is anticipated that the analytical results of these samples will be consistent with other sampling done in the area.

C) Surrounding Environment

Sampling of the soils and perched water both around and under the pad also shows contamination. These results are presented in Appendix A.

Near the pad, the average radionuclide concentrations from Table A-4 at and near the soil surface are 298 ppm uranium and 27 ppm thorium. The average barium concentration from Table A-1 found in this area was 79 ppm. Above background concentrations of lead and chromium were also detected. Analysis for targeted organics found up to isolated incidences of 40 ppb for methylene chloride, 18 ppb for xylene, 12 ppb for carbon disulfide. The concentrations of

acetone were unclear due to its presence in the blanks and the extreme ranges at the same sample locations.

The concentrations of radionuclides just under the pad are an average of 410 ppm uranium and 30 ppm thorium. The sampling effort also found elevated levels of barium and lead. The results from the analysis for targeted organics are not available.

The results from the perched water samples near the pad showed a maximum of 689 ppm total U and the results from under the pad showed a maximum of 441 ppm total U.

D) Groundwater

A cluster of groundwater monitoring wells is located just east of the Plant 1 Pad, at location 055. Wells 1055, 2055, and 3055 have been placed in the till, the upper portion of the sand and gravel aquifer, and in the mid-portion of the aquifer, respectively. The groundwater flow in the regional aquifer in this area is to the east. Wells 2055 and 3055 are hydraulically downgradient of the Plant 1 Pad.

Results from sampling and analysis of these wells are presented in Tables 9 and 10. The groundwater in this area contains relatively low levels of metals and radionuclides and no target organics have been detected.

EVALUATION OF THE MAGNITUDE OF THE THREAT

Controls in Place to Address Potential Threats

Several programs are in place that will provide a reduction in the risk of further releases and contamination from the pad. These programs are described below.

A) Drum Management Plan

The FMPC drum management plan is a comprehensive, phased plan designed to facilitate the proper management of waste drums stored at the FMPC. This plan includes:

- Characterization of waste materials in the drums;
- Prioritization of leaking containers, with overpacking of the most severely deteriorated drums first;
- Movement of drums containing hazardous waste to indoor storage (as space is available);
- Daily leak inspections on the Pad.

B) Drum Transport

There are safety and spill concerns associated with the movement of drums on the pad due to the poor condition of the surface of the pad in some places. Emergency repairs of the concrete surface, a maintenance operation, has been completed. This project involved the resurfacing (with removal of broken surface) of severely damaged concrete, and patching of less severely deteriorated areas. The broken concrete and cutting water has been drummed and sampled. This material is being stored on the Plant 1 Pad until analytical results are received.

These emergency repairs were initiated before the preparation of this RSE. Documentation of these activities is being provided concurrently with this RSE, "Plant 1 Pad Expedited Maintenance".

C) Temporary Cover

Another action taken was the erection of a temporary cover over a portion of the Plant 1 Pad. This project involved the installation of a 5,226 square foot tension support structure as a demonstration project at the FMPC. The purpose of the project is to evaluate the viability of using similar additional structures for covered storage of drums and other materials, and to demonstrate the ease of construction and mobility of these types of structures.

The demonstration will last six months to one year. During this period, approximately 1500 to 2500 drums will be stored under the cover.

Remaining Threat

The above programs will facilitate more controlled operation and management of the pad area, but will not abate the current contamination levels of the pad nor eliminate the potential for additional releases. These remaining threats are discussed below.

A) Continuing Release

In the past, drums in various states of deterioration were stored on the pad. Material leaking or seeping from these containers was washed off onto the pad during periods of rainfall. This material, along with contaminants present on the pad from previous releases, may be carried by runoff to the grassy area on the west side of the pad and to the storm sewer system (and ultimately to the Great Miami River).

While it is recognized that the pad will be included within the Record of Decision for Operable Unit 3, current and near term plans require its use as a staging and enhanced storage area. Therefore, the potential for a continuing release exists.

B) Soils Around the Pad

The potential threat posed by the above background levels of uranium and thorium found in the surface soils near the Plant 1 Pad is the potential for human and environmental exposure to the contaminants as a result of suspension of the soil particles in the atmosphere and/or the potential migration of the contaminants through wind and water erosion. The average concentration of the contaminants in the soil are 298 ppm total uranium and 27 ppm total thorium. It is very likely that these concentrations will exceed clean-up levels for remediation of the FMPC soils. Several recent remedial projects have adopted residual soil activity concentrations for final cleanup actions consistent with the 1981 NRC Branch Technical Position Paper (BTP) on the disposal or on site storage of uranium and thorium materials. Concentrations discussed in this BTP included 35 pCi/g (approx. 50 ppm) for depleted uranium in soils (Aerojet 1984; Colonie, NY 1986) and 10 pCi/g for natural thorium (Th-232 plus Th-228 and other daughters in equilibrium).

Also, the migration of the contaminated soil to previously clean areas could result in more extensive soils cleanup as part of final remedial action.

ASSESSMENT OF THE NEED FOR AN INTERIM RESPONSE

Consistent with section 40 CFR 310.410 of the National Contingency Plan (NCP), the DOE shall determine the appropriateness of a removal action (interim response). Section 40 CFR 300.415 (b)(2) of the NCP defines eight factors that should be considered in determining the appropriateness of a removal action. Five of these factors, listed below, are specifically applicable to this assessment.

<u>40 CFR 300.415 (b)(2)(i)</u> Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

<u>40 CFR 300.415 (b)(2)(ii)</u> Actual or potential contamination of drinking water supplies or sensitive ecosystems.

40 CFR 300.415 (b)(2)(iii) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.

40 CFR 300.415 (b)(2)(v) Weather conditions that may cause hazardous substance or pollutants or contaminants to migrate or be released.

40 CFR 300.415 (b)(2)(vi) Threat of fire or explosion

APPROPRIATENESS OF A RESPONSE

If a planning period of less than six months exists prior to initiation of a response, DOE will prepare an EA-FONSI, Interim Response Action Memorandum. The Action Memorandum will describe the selected response and supporting documentation for the decision. This will serve as the decision document for the RI/FS Administrative Record.

If it is determined that there will be planning period greater than six months before an action is initiated, DOE will prepare an EA-FONSI, Interim Response, Engineering Evaluation/ Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat to public health and the environment. It would then serve as the decision document for the Administrative Record File.

The DOE has determined that a time critical removal action is appropriate, due to the current and on going potential for release of contaminants from the Plant 1 Pad area. The released contamination has the potential to migrate into the environment, where it may result in human exposure or contamination of drinking water supplies. A removal action to control stormwater runoff from this area and deter the further releases of contaminants from leaking drums should be undertaken.

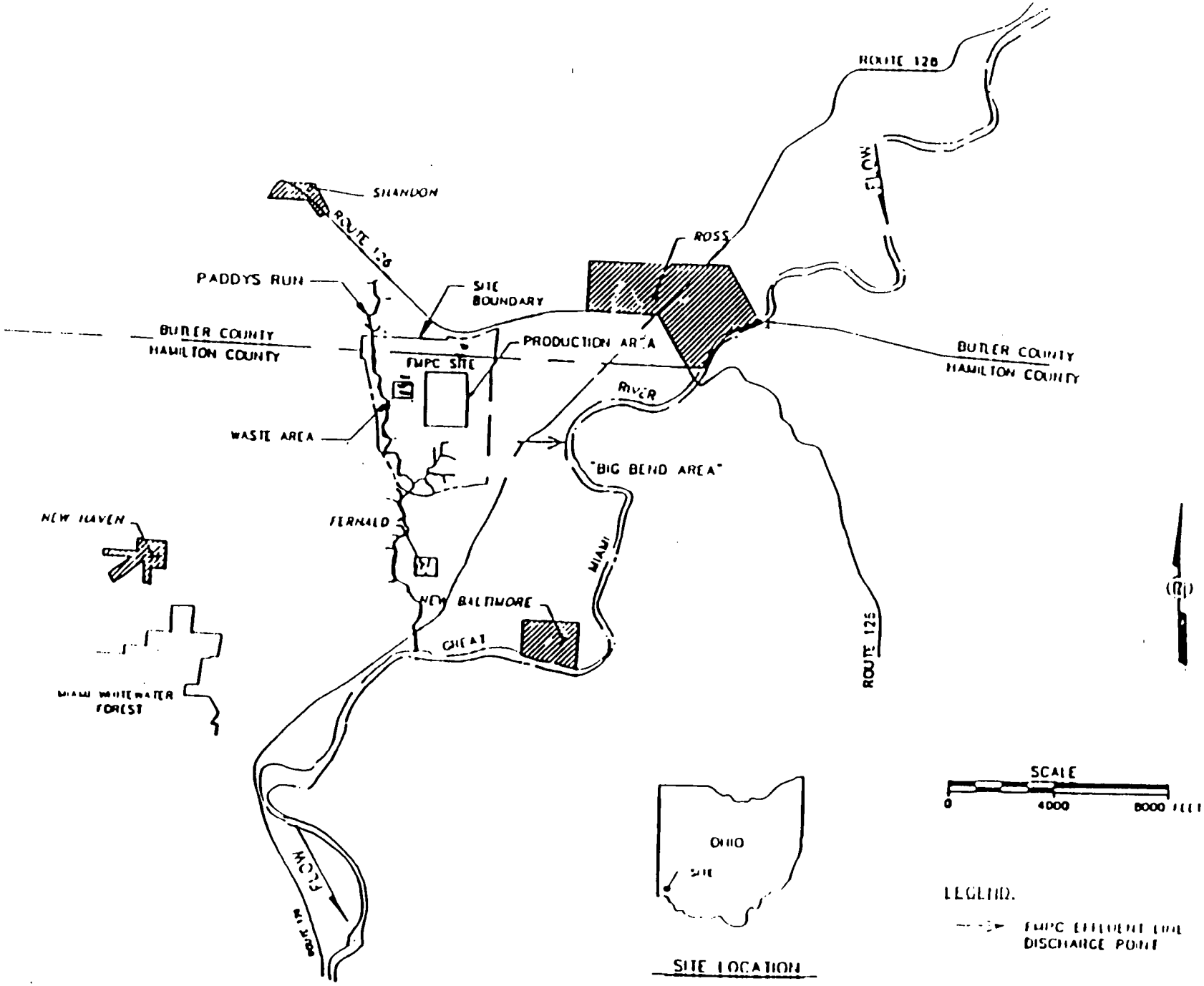
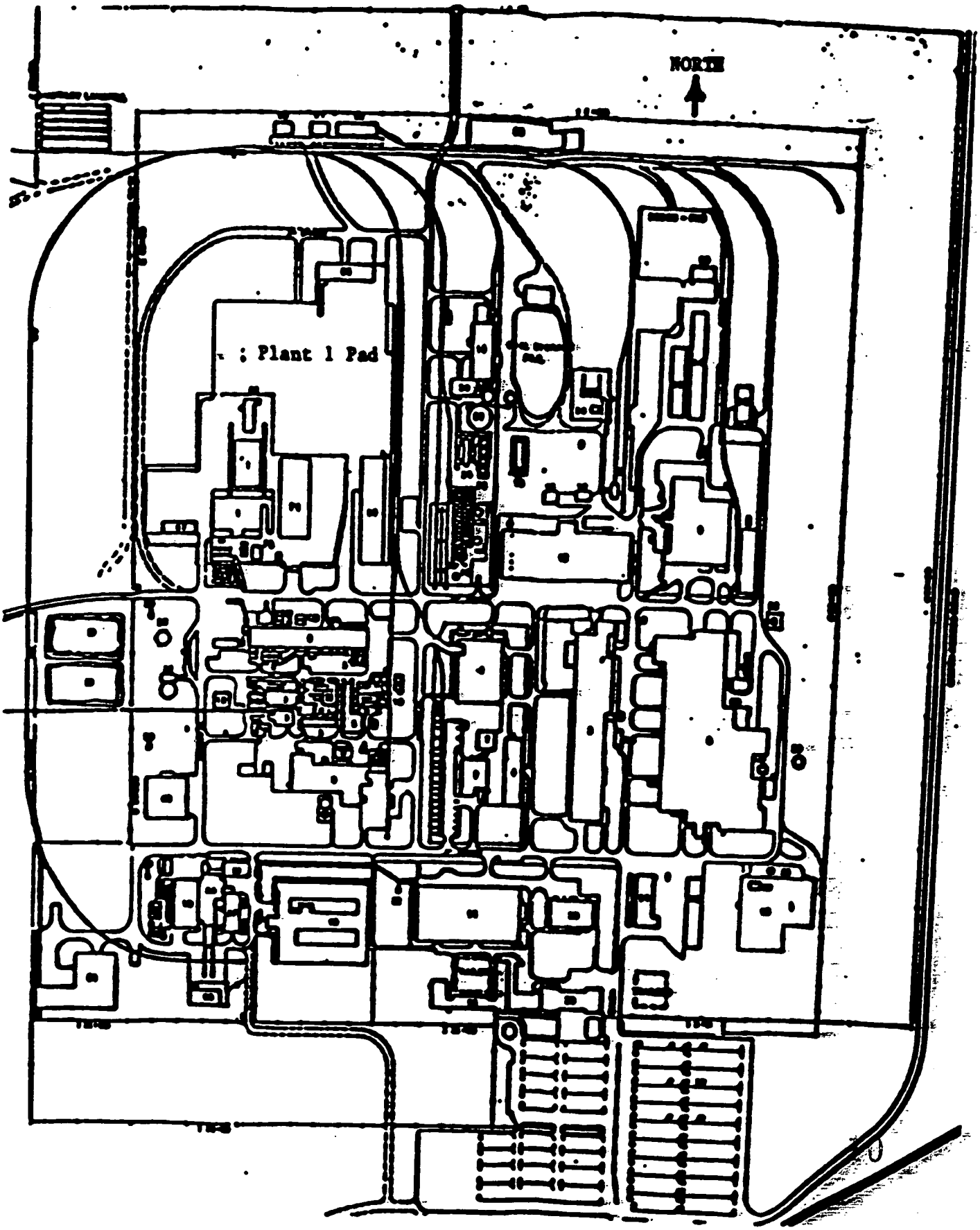


FIGURE 1
FMPC SITE AND VICINITY

FIGURE 2

FMPC SITE



APPENDIX A

SAMPLING AND ANALYSES

APPENDIX A

PLANT 1 PAD SAMPLING AND ANALYSIS

INTRODUCTION

The Plant 1 Pad area is illustrated in Figure 1. In order to characterize conditions at the Plant 1 Pad, surface and subsurface soil and groundwater samples were collected and analyzed for radioactive and chemical constituents. This information was obtained through three programs of sampling.

1) Simple Core Soil Sampling

Initial Samples

Surface soil samples were collected at 21 locations just off the western edge of the pad. Soil samples beneath the concrete, at the western edge were also collected at 7 locations. (These locations can be seen in Figure 2). The samples were collected from three distinct increments within each location, as indicated in Table A-1: Surface (0ft), 1 ft, and 2 ft depths. The samples were collected by FMPC personnel in accordance with FMPC Environmental Monitoring sampling protocols. Analysis of the samples included Primary Total Metals (Table A-1), E.P. Toxicity Metals (Table A-2), Target Volatile Organic (Table A-3), and Radiochemical Metals (Table A-4). The Primary Total Metals, E.P. Toxicity Metals, and radiochemical metals analysis were completed in the FMPC laboratory. The Target Volatile Organic analysis was completed by the NET Laboratory in Dayton Ohio.

Secondary Samples

The soil sampling program was supplemented with the collection of additional soil samples at an 47 locations in the grassy area west of the pad and 23 locations (Figure 4) beneath the pad.

The 47 soil samples taken in the grassy area, shown in Figure 3, were take from two types of sampling locations. One type of sample location had two samples taken from it: one at the surface and one at a depth of 1ft. The other type of sample location had only surface soil samples taken. These differences are also reflected in Figure 3. All samples were taken by FMPC personnel, utilizing FMPC Environmental Monitoring sampling protocols. The samples taken from this area were only tested for radionuclides, as reflected in Table A-5. The analysis for these samples were performed at the FMPC laboratory.

Under Pad Samples

Finally, another 23 locations were sampled beneath the pad with the distribution noted in Figure 4. Samples were taken from the surface soil directly beneath the pad and at a depth of one foot.

The samples were taken by FMPC personnel in accordance with FMPC Environmental Monitoring sampling protocols. The fraction of samples immediately beneath the pad were sent to the International Technologies (IT) Laboratory in Oak Ridge, Tennessee. Analytical results are expected by the end of November, 1990. The samples, sent to IT, are being analyzed for:

Tot U	Tot Th	U-234	U-235	U-238
Tot Pu	Pu-238	Pu-239	Ru-106	TCLP Metals
Np-237	Tc-99	Sr-90	Total Metals	

Isotopic U if Tot U > 45ppm
Isotopic Th if Tot Th > 15ppm

The samples from one foot below the pad were analyzed at the FMPC for total thorium and total uranium only. No measurable thorium was noted and the 16 of 20 samples with measurable uranium averaged 25 ± 22 ppm; analytical sensitivity was 11 ppm. Table A-6 shows the radiological results.

2) Boring Core Soil Sampling

The samples identified below were collected during the Remedial Investigation/Feasibility Study (RI/FS), by Pennsylvania Drilling and Advanced Sciences Inc. contract personnel in accordance with the protocols set forth in RI/FS work plan. The samples were analyzed in the IT laboratory in Oak Ridge, Tennessee, in accordance with Certified Laboratory Protocols. The identified boring locations can be found on Figure 5, and all of the boring data can be found in Table A-7 and A-8.

The information presented on the borings is all that is currently available. Some of the water samples taken from some of the borings, as with the soil samples taken beneath Plant 1 Pad, are being analyzed for additional parameters, including TCLP Metals, Isotopic U, Isotopic Th, etc. These results have not been received yet.

Borings through the Pad

Borings through the concrete pad permitted collection of soil and liquid at six sampling locations, as shown in Figure 5. The crossectional diagrams and relative locations of the seven borings are as follows:

	Boring No.	Location
Fig. 6	1339	NE quadrant
Fig. 7	1342	Center toward west (NNE of Plant 1)
Fig. 8	1343	Center toward east (ENE of Plant 1)
Fig. 9	1345	Center toward west (West of 1342)
Fig. 10	1346	Near shot blaster (N of Plant 1)
Fig. 11	1348	South central (East of Building)
Fig. 12	1361	Under Plant 1 (smaller building)

Locations 1345 and 1346 were more extensively analyzed for potentially hazardous substances than for radioactivity. A brief rundown of the analysis performed at these two locations is given below.

Non-radiological Analyses

The following analyses were performed for non-radiological concentrations:

Analysis	Results
Volatile organic by GCMS	One positive result. No other compounds detected (10 ug/kg trichloroethane in 1346)
Semi-volatile organic by GCMS	None detected
Pesticides and PCBs	None detected
Total Cyanide	None detected
ICP Metals	See Table A-8
Furnace AA Metals	See Table A-8
Cold Vapor AA Hg	See Table A-8
Flame AA for K	See Table A-8

Table A-8 shows the values for those non-radioactive potentially hazardous substances with concentrations in excess of the analytical sensitivity.

Radiological Analyses

Samples from Location 1345 were also analyzed for additional radioactive materials. The following table summarizes the values where results exceeded analytical sensitivity:

Radionuclides at Boring 1345 (Pci/g)

Sr-90	0.8	U-234	4.6
Tc-99	1.4 (single value)	U-238	5.5
		Tot U	13.3 ug/g
Ra-228	0.8		
Th-228	0.8		
Th-232	0.7		
Ra-226	0.8		
Th-230	1.2		

Borings immediately adjacent to the Pad

Three borings were made into soil just off the pad surface (Figure 5). The crossectional diagrams for the three drawings are as follows:

	Boring No.	Location
Fig. 13	1338	North central
Fig. 14	1347	West toward south
Fig. 15	1349	South toward east

Borings in the vicinity of the Pad

Seventeen borings permitted sampling in a ring around the pad at a distance of roughly 100 feet in various directions (Figure 5). These borings were also completed as part of the "Production and Additional Suspect Areas Investigation" section of the Remedial Investigation/Feasibility Study. The borings numbers are as follows:

1333	1334	1335	1336	1337	1340
1341	1344	1350	1351	1352	1353
1354	1356	1357	1358	1359	

Crossectional diagrams for these borings were not prepared because they are outside the area of direct concern, and information gained in boring geology would not add value to the findings presented.

3) Monitor Wells

Monitor well location 55 is located approximately 30 feet east of the pad (Figure 5). Soil and liquid samples were analyzed from wells 1055, 2055, and 3055. The soils samples were taken as part of the RI/FS, as with the other borings, indicated above. The water samples were taken by FMPC personnel in accordance with FMPC Environmental Monitoring Protocols. Laboratory analysis for radionuclides was done at the FMPC Laboratory. Analysis for volatile and non-volatile organic, metals, etc. was done at the NET Laboratory in Dayton, Ohio. Tables A-9 and A-10 present the most recent data from these monitoring wells.

FIGURE 1

PLANT 1 STORAGE PAD

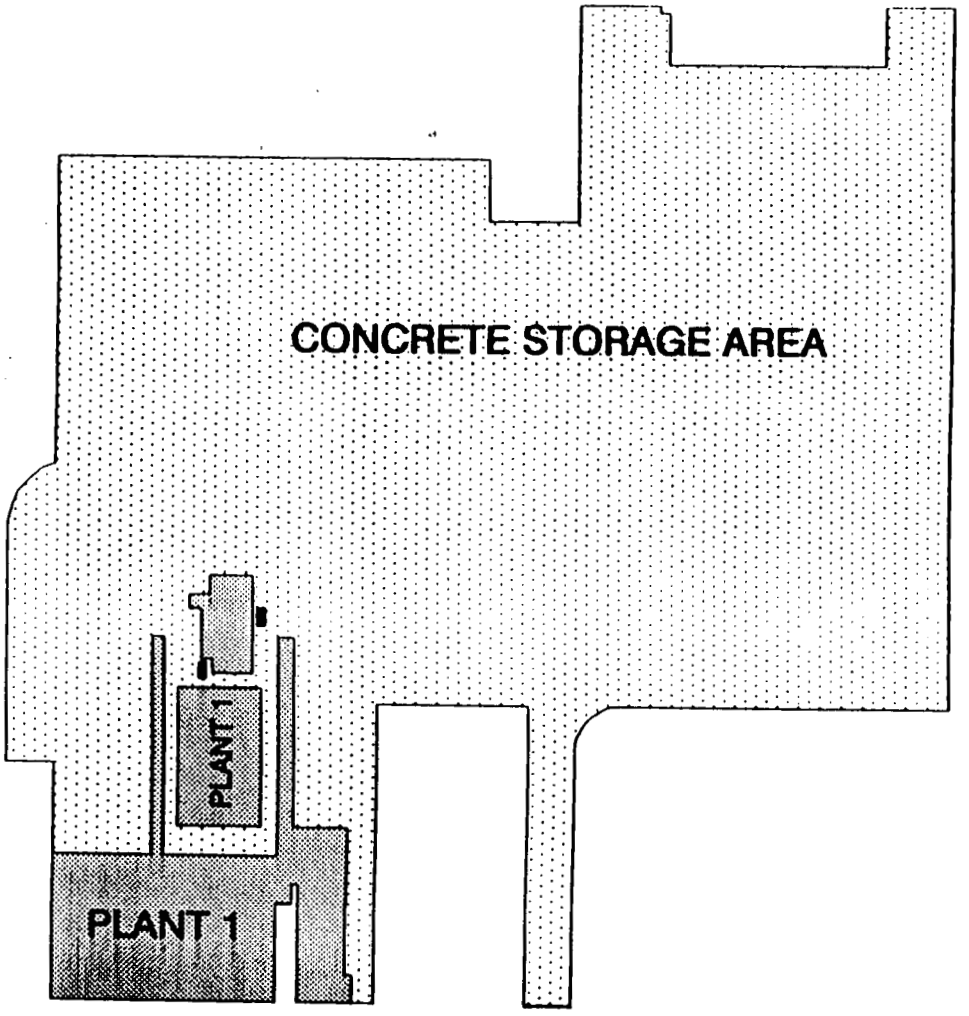


FIGURE 2

PLANT 1 STORAGE PAD

SOIL SAMPLING

ADDITIONAL SOIL SAMPLING PERFORMED IN THIS AREA (SEE FIGURE 3)

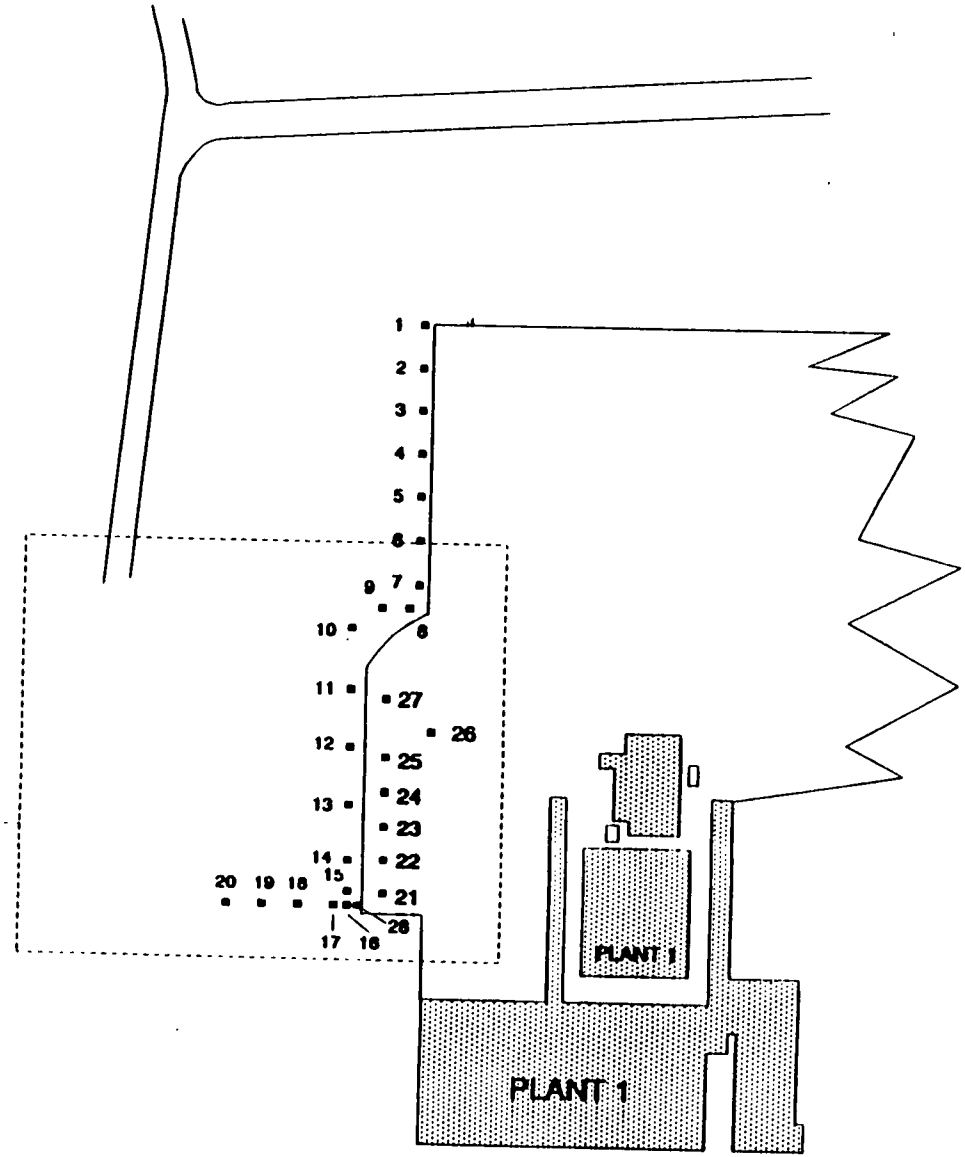


TABLE A-1
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

RCRA METALS

----- Sample ------ Location	Depth	Total Ag (ug/g)	Total As (ug/g)	Total Ba (ug/g)	Total Cd (ug/g)	Total Cr (ug/g)	Total Hg (ug/g)	Total Pb (ug/g)	Total Se (ug/g)
1	0	I	I	I	I	I	I	22.80	I
	1	I	I	I	I	I	I	22.10	I
	2	I	I	I	I	I	I	57.00	I
2	0	< 1	5.00	55.00	< 0.2	7.20	< 0.1	61.30	< 0.1
	1	< 1	4.50	55.50	< 0.2	7.30	< 0.1	39.30	< 0.1
	2	< 1	4.50	75.50	< 0.2	7.70	< 0.1	120.00	< 0.1
3	0	< 1	6.20	69.50	< 0.2	12.30	< 0.1	55.40	< 0.1
	1	< 1	6.50	79.50	< 0.2	9.30	< 0.1	49.60	< 0.1
	2	< 1	4.40	59.00	< 0.2	7.20	< 0.1	8.85	< 0.1
4	0	< 1	4.84	88.10	0.75	11.90	< 0.1	41.80	R
	1	< 1	1.94	84.80	0.30	8.73	< 0.1	15.30	R
	2	< 1	5.72	58.40	< 0.2	8.74	< 0.1	11.50	R
5	0	< 1	5.11	80.00	0.20	8.70	< 0.1	21.40	R
	1	< 1	4.66	55.70	0.20	7.17	< 0.1	10.50	R
	2	< 1	4.36	59.40	< 0.2	7.83	< 0.1	9.90	R
6	0	< 1	6.15	102.00	0.25	11.20	< 0.1	109.70	< 0.1
	1	< 1	7.02	70.40	1.15	7.94	< 0.1	16.10	R
	2	< 1	4.51	117.90	0.80	11.70	< 0.1	12.00	R
7	0	< 1	7.19	104.50	0.55	10.00	< 0.1	22.60	R
	1	< 1	8.09	84.90	0.45	9.39	< 0.1	12.30	R
	2	< 1	6.23	78.20	0.30	6.38	< 0.1	11.50	R
8	0	< 1	8.46	127.60	0.35	6.83	< 0.1	32.50	R
	1	< 1	6.88	115.60	< 0.2	5.53	< 0.1	16.60	R
	2	< 1	4.65	94.20	0.25	6.18	< 0.1	13.80	R
9	0	< 1	6.78	42.90	0.20	2.75	< 0.1	20.90	R
	1	< 1	5.81	93.60	0.30	5.68	< 0.1	14.60	R
	2	< 1	5.58	67.40	< 0.20	4.54	< 0.1	126.70	< 0.1
10	0	< 1	4.41	51.30	0.25	3.29	< 0.1	7.97	R
	1	< 1	6.79	82.90	0.20	6.40	< 0.1	12.70	R
	2	< 1	0.76	39.00	< 0.20	1.45	< 0.1	6.69	R
11	0	< 1	4.04	87.40	1.10	9.64	< 0.1	22.20	< 0.10
	1	< 1	5.55	124.30	0.25	12.00	< 0.1	26.00	< 0.10
	2	< 1	4.14	82.80	0.30	10.70	< 0.1	18.00	< 0.10
12	0	< 1	3.38	46.10	0.40	7.49	< 0.1	21.00	< 0.10
	1	< 1	5.39	85.00	0.20	10.40	0.10	21.90	< 0.10
	2	< 1	4.78	174.60	0.60	12.20	< 0.1	16.90	< 0.10
13	0	< 1	4.35	68.90	0.45	9.59	< 0.1	31.90	< 0.10
	1	< 1	4.14	98.10	0.25	10.90	< 0.1	15.50	< 0.10
	2	< 1	4.84	85.40	< 0.20	10.30	< 0.1	17.30	< 0.10
14	0	< 1	3.04	73.90	< 0.20	6.05	< 0.1	33.30	< 0.10
	1	< 1	5.96	170.30	0.50	11.20	< 0.1	18.40	< 0.10
	2	< 1	5.44	102.20	0.75	12.60	< 0.1	21.20	< 0.10
15	0	< 1	6.75	136.00	0.45	8.55	< 0.1	24.80	< 0.10
	1	< 1	8.12	120.00	0.20	10.00	< 0.1	15.80	< 0.10
	2	< 1	4.84	98.00	0.20	8.25	< 0.1	13.70	< 0.10

TABLE A-1
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

RCRA METALS

----- Sample ------ Location	Depth	Total Ag (ug/g)	Total As (ug/g)	Total Ba (ug/g)	Total Cd (ug/g)	Total Cr (ug/g)	Total Hg (ug/g)	Total Pb (ug/g)	Total Se (ug/g)
16	0	< 1	5.82	67.50	< 0.20	6.95	< 0.1	18.80	< 0.10
	1	< 1	7.00	73.50	2.40	9.30	< 0.1	15.40	0.16
	2	< 1	7.20	84.00	2.20	11.20	< 0.1	14.40	0.10
17	0	< 1	6.20	81.00	1.55	14.30	< 0.1	72.00	0.25
	1	< 1	7.02	73.00	1.10	9.95	< 0.1	16.20	< 0.10
	2	5.80	6.96	100.50	0.95	10.30	< 0.1	13.40	0.10
18	0	< 1	6.49	87.50	1.25	10.60	< 0.1	71.50	0.19
	1	I	I	I	I	I	I	I	I
	2	I	I	I	I	I	I	I	I
19	0	< 1	4.72	71.50	0.60	7.00	< 0.1	43.60	< 0.10
	1	< 1	5.46	75.50	0.45	7.35	< 0.1	42.60	< 0.10
	2	< 1	3.42	130.00	0.20	9.40	< 0.1	14.40	< 0.10
20	0	< 1	3.20	52.00	0.30	8.05	< 0.1	42.00	< 0.10
	1	< 1	3.89	57.50	0.40	9.00	< 0.1	41.60	< 0.10
	2	< 1	8.93	43.60	0.30	6.35	< 0.1	25.60	< 0.10
21	0	< 1	6.46	74.50	0.35	5.75	< 0.1	53.50	0.29
	1	< 1	6.37	101.00	0.25	8.40	< 0.1	53.50	0.10
	2	< 1	4.34	71.00	0.20	7.30	< 0.1	9.45	< 0.10
22	0	< 1	6.26	236.00	0.20	6.65	< 0.1	14.40	< 0.10
	1	< 1	4.99	108.00	0.20	7.50	< 0.1	11.60	0.13
	2	< 1	3.25	75.00	0.25	7.95	< 0.1	13.80	0.16
23	0	< 1	4.32	1080.00	0.30	6.70	< 0.1	9.30	< 0.10
	1	< 1	4.95	186.00	0.20	7.40	< 0.1	17.80	0.14
	2	< 1	4.49	74.00	<.20	7.20	< 0.1	14.40	< 0.10
24	0	< 1	3.65	114.50	<.20	8.60	< 0.1	11.20	< 0.10
	1	< 1	4.34	61.50	0.35	9.55	< 0.1	9.90	< 0.10
	2	< 1	3.76	45.80	<.20	8.10	< 0.1	9.15	< 0.10
25	0	< 1	4.19	83.00	<.20	11.30	< 0.1	9.25	< 0.10
	1	< 1	7.64	92.50	0.20	12.10	< 0.1	15.00	< 0.10
	2	< 1	4.80	32.40	<.20	7.70	< 0.1	12.20	< 0.10
26	0	< 1	4.92	103.50	<.20	8.45	< 0.1	11.50	< 0.10
	1	< 1	5.40	67.50	<.20	9.70	< 0.1	11.10	< 0.10
	2	< 1	4.82	74.00	<.20	11.40	< 0.1	11.10	< 0.10
27	0	< 1	3.62	124.50	<.20	20.00	< 0.1	32.00	< 0.10
	1	< 1	5.68	101.00	<.20	14.10	< 0.1	15.10	< 0.10
	2	< 1	5.20	97.00	<.20	12.10	< 0.1	13.40	< 0.10
28	0	< 1	< 1	91.50	0.90	14.70	< 0.1	83.00	< 0.10
	1	< 1	< 1	103.00	0.40	12.00	< 0.1	69.80	0.14
	2	< 1	5.86	76.50	0.20	8.60	0.10	10.13	0.10

I = Analysis Incomplete
N = Not Analyzed
R = Instrumentation problem - will have to be resampled and reanalyzed.

TABLE A-2
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

Sample Location	Depth	E. P. TOXICITY E.P. Tox. Ag (mg/l)	E.P. Tox. As (mg/l)	E.P. Tox. Ba (mg/l)	E.P. Tox. Cd (mg/l)	E.P. Tox. Cr (mg/l)	E.P. Tox. Hg (mg/l)	E.P. Tox. Pb (mg/l)	E.P. Tox. Se (mg/l)
1	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
2	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
3	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
6	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
11	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
12	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
13	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
14	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
15	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
16	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
17	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
18	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
19	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
20	0	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	1	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1
	2	<1	<1	<25	<0.2	<1	<0.1	<1	<0.1

TABLE A-3
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

ORGANICS

SAMPLE Loctn	Depth	Acetone (ug/Kg)	Qual	Methylene Chloride (ug/Kg)	Qual	Xylene (ug/Kg)	Qual	Carbon Disulfide (ug/Kg)	Qual	UNKNOWNS
1	0 --	A		A		A		A		
	1 --	A		A		A		A		
	2 --	A		A		A		A		
4	0 --	13	U	7	U	7	U	7	U	
	1 --	4	J	38		6	U	6	U	
	2 --	12	U	20		6	U	6	U	
5	0 --	8	J	26		7	U	7	U	
	1 --	36	B	5	U	1	J	5	U	2 ? 7J,9J
	2 --	54	B	5	U	2	J	5	U	4 ? 15J,8J,8J,7J
6	0 --	57	B	5	U	4	J	5	U	
	1 --	24	B	5	U	0.9	J	5	U	2 ? 10J,13J
	2 --	29	B	5	U	1	J	5	U	
7	0 --	28	B	5	U	2	J	2	J	2 ? 12J,15J
	1 --	95	B	5	U	2	J	5	U	2 ? 8J,38J
	2 --	27	B	5	U	2	J	5	U	
8	0 --	57	B	5	U	1	J	5	U	
	1 --	12	B	2	JB	5	U	5	U	
	2 --	14	B	5	U	5	U	5	U	
9	0 --	21	B	3	JB	5	U	5	U	
	1 --	16	B	3	JB	5	U	5	U	
	2 --	18	B	3	JB	5	U	5	U	3 ? 5J,14J,23J
10	0 --	32	B	4	JB	5	U	12		
	1 --	31	B	7	B	5	U	5	U	
	2 --	20	B	7	B	5	U	5	U	
11	0 --	41	B	3	JB	1	JB	5	U	
	1 --	160	B	3	JB	12	B	5	U	
	2 --	52	B	3	JB	20	B	5	U	
12	0 --	5	JB	3	JB	55	B	5	U	
	1 --	140	B	3	JB	7	B	5	U	
	2 --	950	BE	4	JB	27	B	5	U	
13	0 --	22	B	4	JB	7	B	5	U	ETHANOL 15J
	1 --	150	B	3	JB	5	U	5	U	
	2 --	49	B	2	JB	3	JB	5	U	
14	0 --	62	B	1	JB	7	B	5	U	
	1 --	12	B	2	JB	5	U	5	U	
	2 --	8	JB	3	JB	8		5	U	
15	0 --	40	B	3	JB	15		5	U	
	1 --	19	B	5	U	18		5	U	
	2 --	22	B	3	JB	10		5	U	
16	0 --	120	B	3	JB	6		5	U	
	1 --	7	JB	3	JB	3	J	5	U	
	2 --	18	B	26		4	JB	5	U	
17	0 --	57	B	4	JB	2	JB	5	U	4 ? 12J,4J,10J,10J
	1 --	24	B	9		3	JB	5	U	
	2 --	22	B	40		5	JB	5	U	
18	0 --	26	B	15		3	JB	5	U	1? 17J
	1 --	22	B	9		3	JB	11		2 ? 120J,18J
	2 --	7	JB	7		3	JB	5	J	1 ? 10J
19	0 --	8	JB	2	JB	5	U	5	U	
	1 --	18	B	2	JB	5	U	5	U	
	2 --	14	B	5	U	5	U	5	U	

TABLE A-3
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

ORGANICS

SAMPLE Loctn	Depth	Acetone (ug/Kg)	Qual	Methylene Chloride (ug/Kg)	Qual	Xylene (ug/Kg)	Qual	Carbon Disulfide (ug/Kg)	Qual	UNKNOWNS
20	0 --	13	B	2	B	18		5	U	
	1 --	28	B	2	JB	5	U	5	U	
	2 --	14	B	2	JB	10		5	U	
21	0 --	R		R		R		R		
	1 --	R		R		R		R		
	2 --	R		R		R		R		
22	0 --	R		R		R		R		
	1 --	R		R		R		R		
	2 --	R		R		R		R		
23	0 --	R		R		R		R		
	1 --	R		R		R		R		
	2 --	R		R		R		R		
24	0 --									
	1 --									
	2 --									
25	0 --									
	1 --									
	2 --									
26	0 --									
	1 --									
	2 --									
27	0 --									
	1 --									
	2 --									
28	0 --									
	1 --									
	2 --									

U = Not detected. Quantitation limit is listed.

J = Estimated value below quantitation limit.

B = Compound was detected in both the sample and it's associated blank

E = Concentration of the compound exceeded the calibration range of of the instrument.

R = Has been resampled. Original samples analyzed by Enwright Labs reported low limits 125x

A = Has been resampled. Initial samples analyzed by Oak Ridge National Labs reported low

TABLE A-4
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

Sample Location	Depth	RADIONUCLIDES Pu-238 (pCi/g)	Pu-239 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Total Th (ppm)	Calc. Th (pCi/g)	Th-228 (pCi/g)	Total U (ppm)	Calc. U (pCi/g)	U-235 (wt. %)
1	0	N	N	N	N	I	I	I	I	I	I
	1	N	N	N	N	I	I	I	I	I	I
	2	N	N	N	N	I	I	I	I	I	I
2	0	N	N	N	N	<18	9.9	3.8	138	83	0.53
	1	N	N	N	N	<18	13.0	6.9	66	38	0.47
	2	N	N	N	N	<18	6.0	3.3	36	21	0.50
3	0	N	N	N	N	<18	23.0	7.0	1220	920	0.92
	1	N	N	N	N	<18	18.0	5.3	338	220	0.64
	2	N	N	N	N	<18	12.0	6.2	61	37	0.56
4	0	<.3	<.2	3.7	<.92	<18	17.0	3.3	364	200	0.39
	1	I	I	N	N	<18	25.0	6.5	157	87	0.41
	2	I	I	N	N	<18	9.4	5.4	28	15	0.38
5	0	N	N	N	N	21	49.0	6.6	435	250	0.47
	1	N	N	N	N	<23	7.3	2.3	25	15	0.56
	2	N	N	N	N	<23	3.4	1.3	<11	<7.0	0.62
6	0	N	N	N	N	44	100.0	7.3	606	410	0.71
	1	N	N	N	N	<23	<9.5	<2.4	39	16	0.70
	2	N	N	N	N	<23	<9.0	<2.3	15	10	0.69
7	0	N	N	N	N	26	<9.4	<2.3	164	110	0.70
	1	N	N	N	N	<23	11.0	2.2	118	79	0.70
	2	N	N	N	N	<23	<9.4	<2.4	11	7.1	0.65
8	0	0.66	<0.20	3.3	1.9	<23	7.9	2.8	70	45	0.63
	1	0.61	<0.20	N	N	<23	7.9	4.1	26	16	0.57
	2	<0.30	<0.20	N	N	<23	9.5	5.1	<11	<7.0	0.61
9	0	N	N	N	N	<23	16.0	6.4	40	26	0.64
	1	N	N	N	N	<23	9.9	5.3	34	23	0.73
	2	N	N	N	N	<23	8.4	3.5	13	8.8	0.73
10	0	N	N	N	N	29	17.0	4.8	184	120	0.68
	1	N	N	N	N	<23	12.0	7.2	24	17	0.75
	2	N	N	N	N	<23	9.4	6.2	<11	<7.4	0.72
11	0	N	N	N	N	<23	18.0	7.4	274	180	0.64
	1	N	N	N	N	<18	12.0	6.4	23	15	0.68
	2	N	N	N	N	<18	5.0	2.3	<11	7.3	0.69
12	0	<0.30	0.35	3.0	2.4	<18	15.0	4.1	133	88	0.68
	1	<.0.30	<0.20	N	N	<18	5.2	2.5	58	40	0.74
	2	<0.30	<0.20	N	N	<18	5.4	2.8	37	25	0.71
13	0	N	N	N	N	<18	20.0	5.5	323	190	0.51
	1	N	N	N	N	<18	10.0	3.7	132	83	0.60
	2	N	N	N	N	<18	5.9	2.8	44	27	0.57
14	0	N	N	N	N	27	20.0	6.5	419	270	0.63
	1	N	N	N	N	<18	14.0	3.3	110	74	0.71
	2	N	N	N	N	<18	9.3	4.6	26	17	0.67
15	0	N	N	N	N	94	18.0	5.4	345	210	0.54
	1	N	N	N	N	25	19.0	7.4	122	81	0.69
	2	N	N	N	N	<18	10.0	4.6	24	16	0.71
16	0	0.48	0.23	1.1	1.7	<18	9.3	3.8	34	34	0.74
	1	0.76	0.33	N	N	<18	14.0	6.0	70	49	0.78
	2	<.3	<.2	N	N	<18	9.5	5.1	25	18	0.79
17	0	N	N	N	N	37	240.0	9.7	375	270	0.85
	1	N	N	N	N	<18	17.0	7.4	86	59	0.74
	2	N	N	N	N	<18	7.6	3.5	12	8.2	0.75
18	0	N	N	N	N	31	75.0	6.0	414	310	0.90
	1	N	N	N	N	<18	14.0	4.0	123	91	0.88
	2	N	N	N	N	<18	11.0	4.1	32	24	0.88
19	0	N	N	N	N	18	48.0	4.8	294	230	0.96
	1	N	N	N	N	<18	21.0	4.2	122	89	0.87
	2	N	N	N	N	<18	8.6	4.2	16	12	0.85
20	0	<.3	<.2	16	2.2	<18	40.0	4.4	152	120	0.99
	1	<.3	<.2	N	N	<18	28.0	4.5	115	88	0.95
	2	<.3	<.2	N	N	<18	12.0	5.6	19	14	0.85
21	0	N	N	N	N	<18	23.0	3.2	553	380	0.73
	1	N	N	N	N	<18	8.1	3.8	68	46	0.72
	2	N	N	N	N	<18	8.0	4.6	11	7.4	0.72

TABLE A-4
SUMMARY OF ANALYSES
PLANT 1 PAD PHASE A/B CONSTRUCTION AREA

Sample Location	Depth	RADIONUCLIDES Pu-238 (pCi/g)	Pu-239 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Total Th (ppm)	Calc. Th (pCi/g)	Th-228 (pCi/g)	Total U (ppm)	Calc. U (pCi/g)	U-235 (wt. %)
22	0	N	N	N	N	18	8.2	4.4	187	130	0.83
	1	N	N	N	N	<18	11.0	5.0	18	11	0.58
	2	N	N	N	N	<18	5.6	3.2	<11	<7.5	0.73
23	0	N	N	N	N	<18	8.3	4.0	91	57	0.58
	1	N	N	N	N	<18	9.7	5.0	20	14	0.72
	2	N	N	N	N	<18	10.0	5.2	<11	<7.6	0.76
24	0	<.3	<.2	0.39	3.1	<18	6.5	1.6	318	210	0.67
	1	<0.14	0.11	N	N	<18	6.2	2.3	<11	<7.6	0.76
	2	<0.14	<0.10	N	N	<18	5.1	1.9	<11	<7.3	0.70
25	0	N	N	N	N	<18	9.2	5.2	209	140	0.66
	1	N	N	N	N	<18	7.8	3.9	29	19	0.66
	2	N	N	N	N	<18	9.9	5.3	11	7.3	0.69
26	0	N	N	N	N	18	16.0	6.2	152	100	0.67
	1	N	N	N	N	<18	8.8	4.0	15	10	0.72
	2	N	N	N	N	<18	12.0	5.8	<11	<7.4	0.71
27	0	N	N	N	N	<18	9.9	5.1	959	630	0.66
	1	N	N	N	N	<18	12.0	6.7	25	17	0.69
	2	N	N	N	N	<18	7.4	2.6	<11	<8.4	0.94
28	0	1.5	0.49	75	11	113	160.0	15.0	813	560	0.76
	1	0.28	<0.14	N	N	27	37.0	6.3	210	140	0.69
	2	<0.23	<0.14	N	N	<18	6.6	3.4	11	7.3	0.73

FIGURE 3

ADDITIONAL SOIL SAMPLING

● SURFACE SAMPLE + 1ft DEPTH SAMPLE

XXX / YYY = SURFACE SAMPLE NO / 1ft DEPTH SAMPLE NO.

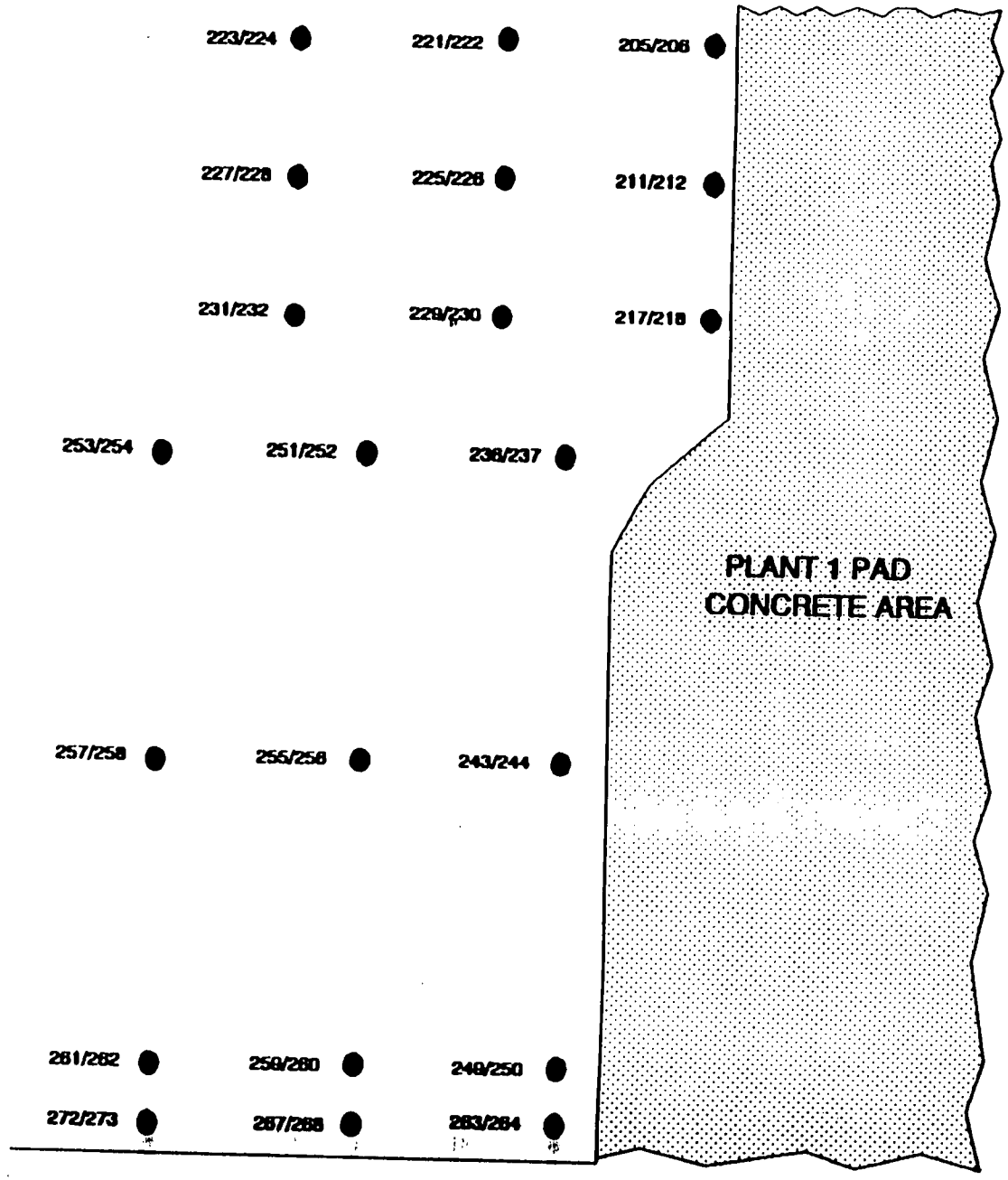


TABLE A-5

CONTROLLED STORAGE PAD, PLANT 1
ANALYTICAL RESULTS

SAMPLE NUMBER	TOTAL U(ppm)	TOTAL Th(ppm)	U pCi/g	Th pCi/g	Th-228 pCi/g	WEIGHT % (U) U-234	U-235	U-236	U-238
205	46	<23	28.0	<3.5	1.0	0.004	0.52	0.005	99.47
206	30	<23							
207	51	<23	31.0	<4.5	2.0	0.002	0.55	0.001	99.45
208	115	<23	69.0	<6.4	3.9	0.001	0.52	0.005	99.47
209	278	29	160.0	4.9	1.8	0.002	0.45	0.005	99.54
210	751	32	530.0	5.7	2.3	0.005	0.80	0.014	99.18
211	751	26	380.0	6.3	3.5	0.005	0.29	0.005	99.70
212	305	<45							
213	2460	25	1400.0	<7.9	3.1	0.007	0.45	0.005	99.54
214	238	28	140.0	6.5	3.8	0.004	0.48	0.008	99.51
215	245	28	160.0	7.2	4.2	0.001	0.60	0.001	99.40
216	216	45	140.0	5.7	2.7	0.007	0.68	0.006	99.31
217	649	<23	440.0	8.2	3.4	0.002	0.72	0.004	99.27
218	83	29							
219	326	32	220.0	6.1	3.0	0.005	0.70	0.004	99.29
220	471	40	300.0	5.9	2.5	0.004	0.62	0.004	99.37
221	596	<23	430.0	7.2	2.9	0.005	0.82	0.005	99.17
222	39	<23							
223	49	<23	33.0	<3.8	1.3	0.008	0.70	0.013	99.28
224	45	<23							
225	57	<23	35.0	<4.1	1.6	0.004	0.55	0.007	99.44
226	20	<23							
227	60	<23	41.0	<4.3	1.8	0.008	0.59	0.010	99.39
228	31	<23							
229	86	<23	50.0	<3.9	1.4	0.002	0.47	0.005	99.52
230	19	<23							
231	40	<23	26.0	<3.4	0.9	0.008	0.65	0.009	99.33
232	15	<23							
233	71	<23	44.0	<3.7	1.2	0.001	0.59	0.005	99.40
234	133	23	87.0	4.4	1.9	0.004	0.66	0.005	99.33
235	101	<23	66.0	<4.1	1.6	0.004	0.65	0.008	99.34
236	150	39	98.0	8.6	4.4	0.008	0.66	0.011	99.32
237	35	<23							
238									
239	3840	<45	2500.0	<7.9	3.1	0.005	0.65	0.007	99.34
240	72	<23	48.0	3.9	0.9	0.010	0.71	0.010	99.27
241	39	<23	25.0	4.4	0.9	0.002	0.63	0.005	99.36
242	204	24	150.0	7.0	2.1	0.005	0.87	0.007	99.12
243	130	24	86.0	10.2	1.4	0.003	0.69	0.003	99.30
244	106	<23							
245	83	<23	58.0	7.3	1.5	0.001	0.68	0.003	99.32
246	250	35	150.0	11.7	3.4	0.002	0.49	0.007	99.50
247	404	325	240.0	90.3	30.4	0.002	0.52	0.006	99.47
248	278	184	170.0	36.3	14.2	0.007	0.60	0.011	99.38
249	316	42	230.0	14.6	2.8	0.006	0.86	0.007	99.13
250	63	24							
251	88	24	53.0	9.8	1.1	0.005	0.54	0.005	99.45
252	16	<23							
253	87	<23	55.0	8.0	1.1	0.005	0.61	0.005	99.38
254	41	<23							
255	43	<23	28.0	5.1	1.1	0.005	0.68	0.007	99.31
256	16	<23							
257	65	<23	43.0	<2.1	<.7	2.000	0.70	0.007	97.29
258	29	<23							
259	182	26	130.0	16.1	1.4	0.007	0.85	0.008	99.14
260	48	<23							
261	133	<23	100.0	15.5	1.7	0.005	0.92	0.007	99.07
262	24	<23							
263	358	41	260.0	33.1	3.2	0.005	0.82	0.006	99.17
264	107	24							
265	347	35	260.0	30.3	2.8	0.008	0.91	0.004	99.08
266	467	39	350.0	49.1	2.9	0.007	0.91	0.007	99.08
267									
268	365	30	270.0	26.5	1.9	0.005	0.92	0.005	99.07
269	102	<23							
270	266	<23	210.0	29.9	1.4	0.009	0.99	0.006	99.00
271	89	<23	67.0	<4.0	1.5	0.002	0.93	0.003	99.06
272	219	25	170.0	5.1	2.4	0.008	0.93	0.006	99.06
273	53	<23							

PLANT 1 STORAGE PAD

FIGURE 4

UNDER-PAD SAMPLING LOCATIONS

PT.	FT - IN EAST	FT - IN NORTH
1	234	25 - 6
2	245 - 9	25 - 6
3	257 - 4	25 - 6
4	270	25 - 6
5	281 - 9	25 - 6
6	306 - 3	25 - 6
7	331 - 3	25 - 6
8	200	54 - 7
9	200	31 - 6
10	200	23 - 6
11	331 - 3	5 - 6
PT.	**FT - IN EAST**	**FT - IN SOUTH**
12	175	7
13	151	12 - 5
14	140	30 - 5
15	116	33
16	116	16 - 6
17	90	24
18	77	22
19	60	13 - 6
20	60	19 - 4
21	50	38 - 7
22	35	34 - 6
23	36	54 - 6

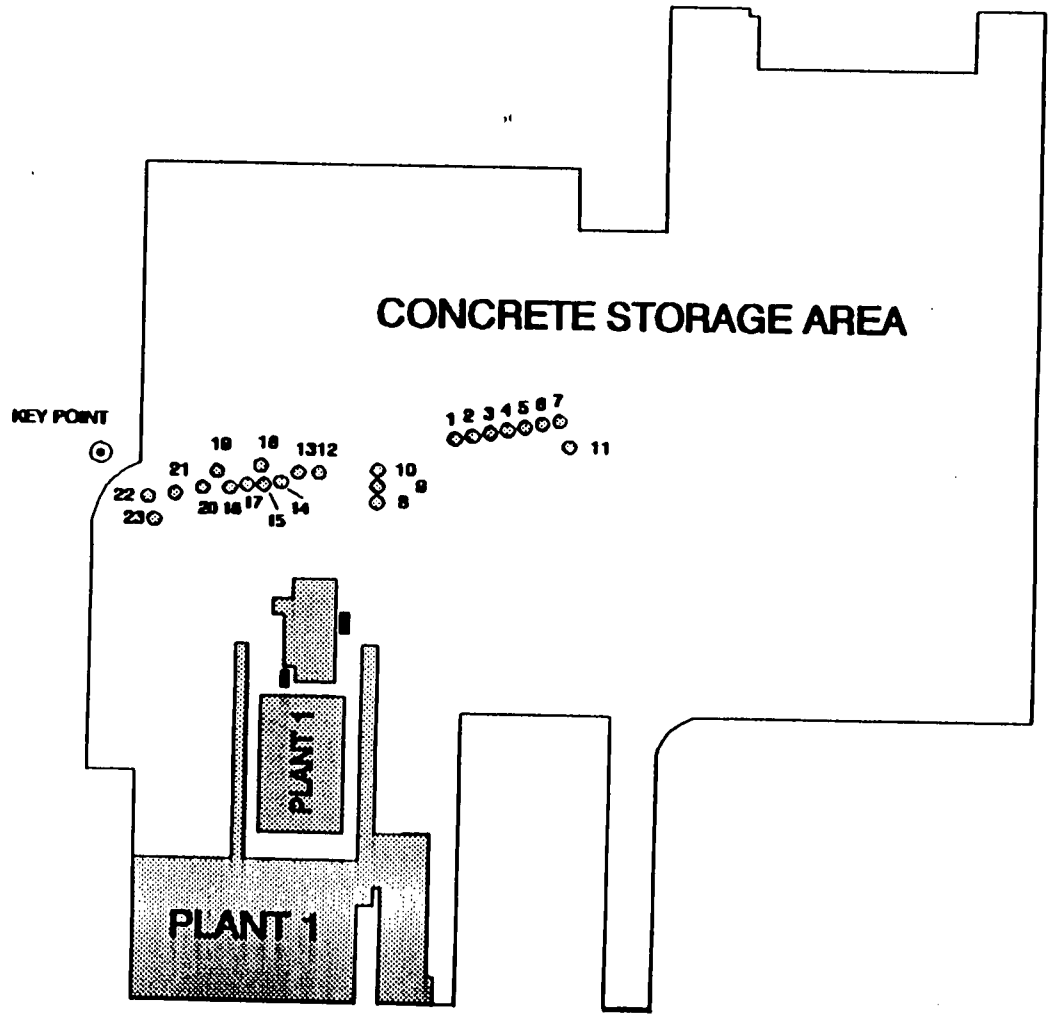


Table A-6

Thorium and Uranium Measurements
at 23 Additional Sampling Locations
Directly Under Plant 1 Pad

Fig. 4 Sample Location	Beneath Pad Surface Soil		Soil at 1 ft. Depth Beneath Surface	
	Th (ppm)	U (ppm)	Th (ppm)	U (ppm)
1			< 18	16
2			< 18	13
3			< 18	15
4			< 18	13
5			< 18	11
6			< 18	25
7			< 18	< 11
8			< 18	18
9			< 18	< 11
10				
11			< 18	97
12			< 18	< 11
13			< 18	18
14			< 18	11
15			< 18	14
16				
17				
18			< 18	30
19			< 18	17
20			< 18	19
21			< 18	31
22			< 18	47
23			< 18	11

FIGURE 5
BORINGS AT PLANT 1 PAD

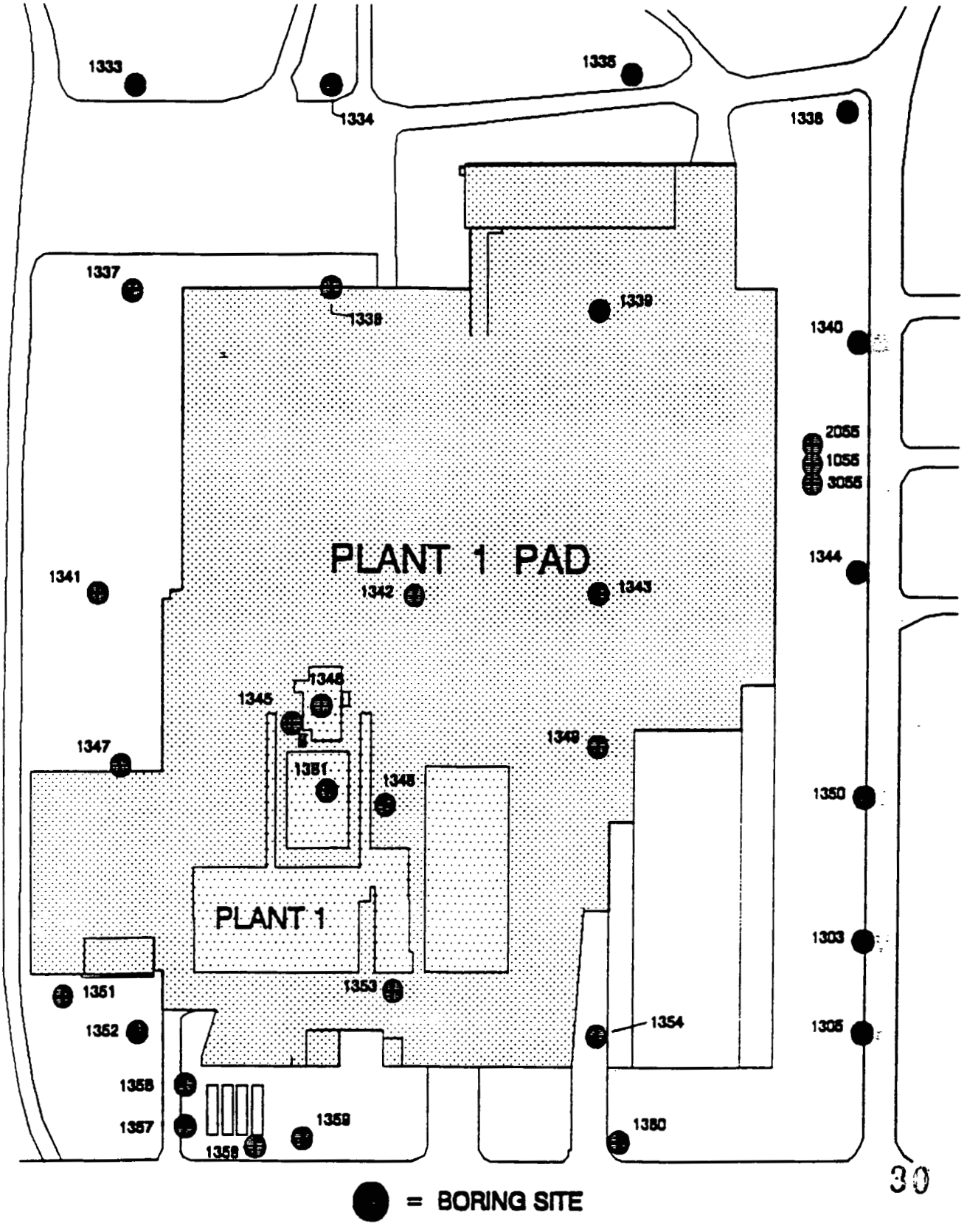


TABLE A-7

PLANT 1 PAD BORING DATA

BORINGS THROUGH PLANT 1 PAD

BORING NUMBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)
39	1.0 TO 1.5	26.2	5.0
--	2.0 TO 2.5	< 3.1	8.6
	4.5 TO 5.0	6.6	< 4.4
	10.5 TO 11.0	2.4	< 4.0
	GROUNDWATER	441.0 ug/l @ 5 ft	
	NITRATES	0.1 & 0.12 mg/l	
2	1.0 TO 1.5	15.0	7.8
-	4.0 TO 4.5	4.0	< 4.0
	5.0 TO 5.5	3.0	12.0
	10.5 TO 11.0	4.0	7.4
	16.5 TO 17.0	4.0	< 4.1
	GROUNDWATER	26.0 ug/l @ 13.5 ft	
	NITRATES	< 0.1 mg/l	
3	1.0 TO 1.5	75.1	< 4.6
-	3.0 TO 3.5	2.6	< 5.4
	6.0 TO 6.5	2.8	< 3.0
	10.0 TO 10.5	2.3	3.7
	GROUNDWATER	40.6 ug/l @ 8.0 ft	
	NITRATES	< 0.1 mg/l	
5	1.0 TO 1.5	27.5	10.3
-	2.0 TO 2.5	3.7	--
	3.5 TO 4.0	2.9	< 3.5
	5.0 TO 5.5	4.5	10.8
	10.5 TO 11.0	13.7	8.3
	GROUNDWATER	2.0 ug/l @ 13.5 ft	
6	0.0 TO 0.5	28.9	7.0
-	3.0 TO 3.5	10.2	6.7
	5.0 TO 5.5	4.5	8.7
	10.0 TO 10.5	5.2	4.2
	15.0 TO 15.5	6.1	6.6
	GROUNDWATER	ug/l @ 15.0 ft	

BORINGS OFF THE PAD'S EDGE

BORING NUMBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)
1338	0.0 TO 0.5	211.0	25.0
----	3.0 TO 3.5	49.0	23.0
	5.0 TO 5.5	73.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	GROUNDWATER	40.0 ug/l @ 6.5 ft	
	NITRATES	0.1 mg/l	
1347	RESULTS NOT RECEIVED		

1349	0.0 TO 0.5	7.0	7.0
----	2.0 TO 2.5	5.0	14.0
	5.0 TO 5.5	4.0	14.0
	10.0 TO 10.5	3.0	4.0
	15.0 TO 15.5	5.0	< 8.0
	GROUNDWATER	NONE	

BORINGS IN THE VICINITY OF THE PAD

BORING NUMBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)
1333	0.0 TO 0.5	82.0	<23.0
----	2.0 TO 2.5	< 11.0	<23.0
	5.0 TO 5.5	11.0	<23.0
	10.0 TO 10.5	20.0	<23.0
	15.0 TO 15.5	< 11.0	<23.0
1334	0.0 TO 0.5	< 11.0	<23.0
----	1.5 TO 2.0	< 11.0	<23.0
	5.0 TO 5.5	11.0	<23.0
1335	0.0 TO 0.5	27.0	<23.0
----	2.0 TO 2.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	15.0 TO 15.5	< 11.0	<23.0
1336	0.0 TO 0.5	< 11.0	<23.0
----	3.0 TO 3.5	< 11.0	<23.0
	6.0 TO 6.5	< 11.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	15.0 TO 15.5	< 11.0	<23.0
	GROUNDWATER	127.0 ug/l	
1337	0.0 TO 0.5	33.0	<23.0
----	3.0 TO 3.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	10.0 TO 10.5	16.0	<23.0
	GROUNDWATER	689.0 ug/l	
1340	0.0 TO 0.5	98.0	24.0
----	3.0 TO 3.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	GROUNDWATER	32.0 ug/l	
1341	0.0 TO 0.5	30.8	7.6
----	3.0 TO 3.5	6.9	8.0
	5.0 TO 5.5	5.0	9.9
	10.0 TO 10.5	3.7	11.8
	GROUNDWATER	28.0 ug/l	
1344	0.0 TO 0.5	28.0	<23.0
----	3.0 TO 3.5	17.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	5.0 TO 5.5	5.0	9.9
	10.0 TO 10.5	3.7	11.8
	GROUNDWATER	28.0 ug/l	
1350	0.0 TO 0.5	15.0	<23.0
----	3.0 TO 3.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	GROUNDWATER	40.9 ug/l	
1351	0.0 TO 0.5	25.0	<23.0
----	2.0 TO 2.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	10.5 TO 11.0	< 11.0	<23.0
	15.0 TO 15.5	< 11.0	<23.0
	GROUNDWATER	11.0 ug/l	
1352	0.0 TO 0.5	29.0	<23.0
----	3.0 TO 3.5	13.0	<23.0
	6.0 TO 6.5	< 11.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	15.0 TO 15.5	12.0	<23.0
	GROUNDWATER	226.0 ug/l	
1353	1.0 TO 1.5	< 11.0	--
----	2.0 TO 2.5	< 11.0	--
	5.0 TO 5.5	< 11.0	--
	10.5 TO 11.0	< 11.0	--
	15.0 TO 15.5	< 11.0	--
	GROUNDWATER	24.0 ug/l	
1354	1.0 TO 1.5	< 11.0	--
----	3.0 TO 3.5	21.0	--
	5.0 TO 5.5	< 11.0	--
	10.0 TO 10.5	12.0	--
	15.0 TO 15.5	< 11.0	--
	GROUNDWATER	93.0 ug/l	

TABLE A-7 (cont'd)

PLANT 1 PAD BORING DATA

BORINGS THROUGH PLANT 1 PAD

RING MBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)
8	0.0 TO 0.5	28.0	4.0
--	1.5 TO 2.0	11.0	6.0
	4.5 TO 5.0	3.0	12.0
	10.0 TO 10.5	6.0	9.0
	14.5 TO 15.0	3.0	7.0
	GROUNDWATER	20.5 ug/l @ 16.0 ft	
	NITRATES	< 0.1 mg/l	
1	1.0 TO 1.5	22.7	2.9
-	2.0 TO 2.5	49.4	1.9
	3.0 TO 3.5	6.8	7.6
	6.0 TO 6.5	3.1	8.8
	7.0 TO 7.5	3.1	4.9
	GROUNDWATER	38.6 ug/l @ 13.5 ft	
	NITRATES	< 0.1 mg/l	

BORINGS OFF THE PAD'S EDGE

BORING NUMBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)

BORINGS IN THE VICINITY OF THE PAD

BORING NUMBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)
1356	0.0 TO 0.5	46.0	<23.0
----	2.0 TO 2.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	10.5 TO 11.0	119.0	30.0
	15.0 TO 15.5	14.0	<23.0
	GROUNDWATER	240.0 ug/l	
1357	0.0 TO 0.5	41.0	<23.0
----	3.0 TO 3.5	20.0	<23.0
	5.0 TO 5.5	22.0	<23.0
	10.5 TO 11.0	29.0	<23.0
	15.0 TO 15.5	17.0	<23.0
	GROUNDWATER	748.0 ug/l	

BORING NUMBER	DEPTH (ft)	TOTAL u (ppm)	TOTAL Th (ppm)
1358	0.0 TO 0.5	78.0	<23.0
----	2.0 TO 2.5	< 11.0	<23.0
	5.0 TO 5.5	13.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	GROUNDWATER	205.0 ug/l	
1359	0.0 TO 0.5	57.0	<23.0
----	2.0 TO 2.5	< 11.0	<23.0
	5.0 TO 5.5	< 11.0	<23.0
	10.0 TO 10.5	< 11.0	<23.0
	14.5 TO 15.0	< 11.0	<23.0
	GROUNDWATER	405.0 ug/l	

FIGURE 6

CROSSECTIONAL OF BORING NUMBER 1339 ON PLANT 1 PAD

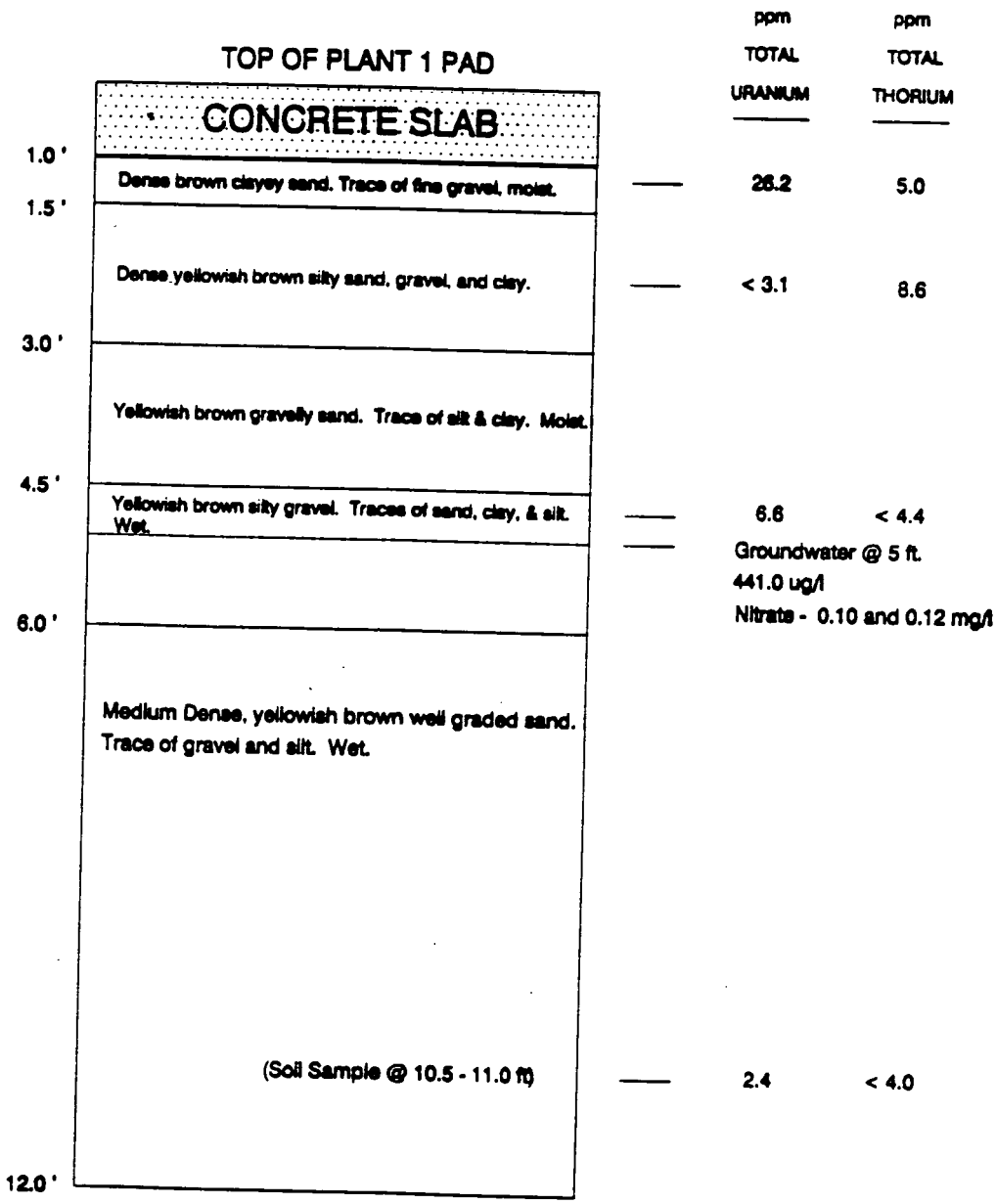


FIGURE 7

CROSSECTIONAL OF BORING NUMBER 1342 ON PLANT 1 PAD

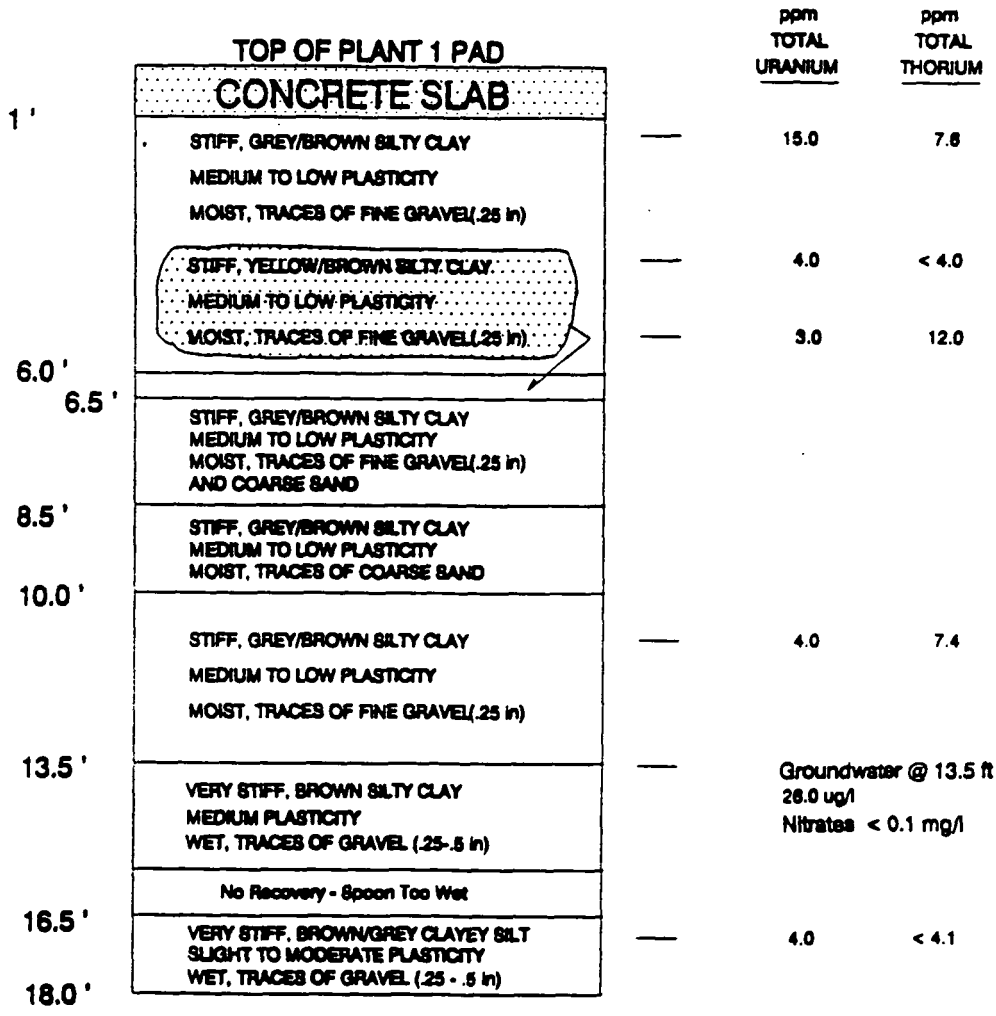


FIGURE 8

CROSSECTIONAL OF BORING NUMBER 1343 ON PLANT 1 PAD

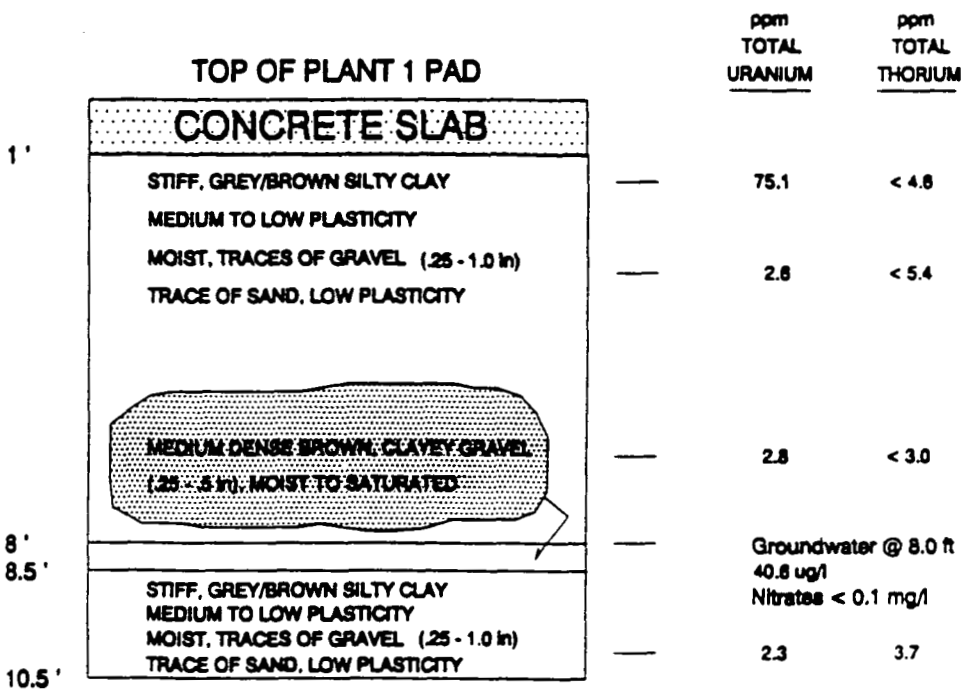


FIGURE 9

CROSSECTIONAL OF BORING NUMBER 1345 ON PLANT 1 PAD

TOP OF PLANT 1 PAD

CONCRETE SLAB

		ppm TOTAL URANIUM	ppm TOTAL THORIUM
1.0 ' – 1.5 '	Stiff, yellow/brown silty clay, with sand and trace of fine gravel. Plastic & moist.	27.5	10.3
1.5 ' – 3.0 '	Stiff dark gray clay. Some silt, low plasticity, moist.	3.7	–
3.0 ' – 4.5 '	Soft olive gray silty clay. Medium plasticity, moist.	2.9	< 3.5
4.5 ' – 6.0 '	Dark olive to black clay. Some silt and sand. Fine to medium gravel, medium plasticity, moist.	4.5	10.8
6.0 ' – 6.5 '	Very soft yellowish brown silty clay. Medium plasticity, moist.		
6.5 ' – 7.5 '	Stiff black clay, some silt. Medium plasticity, moist.		
7.5 ' – 9.0 '	Very soft, olive brown sandy clay. Traces of fine gravel Low plasticity, very moist.		
9.0 ' – 10.5 '	Very soft dark grayish brown sandy clay. Trace of fine gravel, medium plasticity, very moist.		
10.5 ' – 11.0 '	Very soft yellowish brown sandy clay, very moist.	13.7	8.3
11.0 ' – 12.0 '	Dark gray clay, trace of silt, medium plasticity, moist.		
12.0 ' – 13.5 '	Stiff light gray clay, trace of silt and sand. Medium plasticity, moist.		
13.5 ' – 14.0 '	Light olive brown clayey silt with sand and gravel. Moist	Groundwater @ 13.5 ft. 2.0 ug/l	
14.0 ' – 16.0 '	Light gray silty clay. Trace of fine gravel. Medium plasticity, moist.		

** Average of two samples plus one duplicate

FIGURE 10

CROSSECTIONAL OF BORING NUMBER 1346 ON PLANT 1 PAD

TOP OF PLANT 1 PAD

		ppm TOTAL URANIUM	ppm TOTAL THORIUM
	CONCRETE SLAB		
1.0' – 1.5'	Stiff olive brown clay, with trace of sand & fine gravel. Low Plasticity, moist.	28.9	7.0
	NO RECOVERY		
3.0' – 4.0'	Stiff olive gray silty clay with a trace of sand Low plasticity, moist.	10.2	6.7
	Soft to stiff olive brown silty clay with trace of sand. Medium plasticity, moist.		
5.0' – 5.5'	Med. stiff olive silty clay/trace sand. Med Plas. moist.	4.5	8.7
	NO RECOVERY		
6.0' – 6.5'	Med. stiff olive silty clay/trace sand. Med Plas. moist.		
	NO RECOVERY		
7.5' – 8.5'	Stiff light olive brown silth clay, trace sand/fine gravel. Medium Plasticity, moist.		
	NO RECOVERY		
9.0' – 10.0'	Med stiff yellow brown silty clay, trace sand/fine gravel. Medium plasticity, moist.		
10.5'	Stiff dark gray silty clay, trace sand. Low plasticity, moist.	5.2	4.2
12.5'	Stiff dark gray silty clay, trace sand. Low plasticity, moist.		
14.5'	Med stiff yellow brown silty clay, trace sand/fine gravel. Medium plasticity, moist.		
15.0'	Very soft olive gray clay, trace silt, med. plast., moist.	Groundwater @ 15.00 ft.	
	Dense light brown silt and sand. Very wet.	6.1	6.6
19.5' – 20.0'	Medium dense olive gray sandy silt. Moist.		

FIGURE 11

CROSSECTIONAL OF BORING NUMBER 1348 OFF PLANT 1 PAD

TOP OF PLANT 1 PAD

CONCRETE SLAB

		ppm TOTAL URANIUM	ppm TOTAL THORIUM
1.0 '	Stiff gray gravelly clay. Low Plasticity. Moist	28.0	4.0
1.5 '	Stiff dark gray clay. Low plasticity. Moist	11.0	6.0
3.0 '	Medium stiff brown gray silty clay. Trace of sand. Moist.		
4.5 '	Stiff dark brown silty clay. Low plasticity. Moist.	3.0	12.0
6.0 '	Stiff grayish brown silty clay. Low plasticity. Moist.		
7.5 '	Medium stiff gray silty clay. Low plasticity. Moist.		
9.5 '	Stiff dark gray clay. Trace of sand. Low plasticity. Moist.	6.0	9.0
12.0 '	Stiff gray clay. Trace of gravel. Medium plasticity. Moist.		
14.5 '	Grayish brown clay. Trace of gravel. Medium plasticity. Moist.	3.0	7.0
16.0 '	Gray clayey silt. Trace of gravel. Wet	Groundwater @ 16 ft. 20.5 ug/l Nitrate < 0.1 mg/l	
	Gray brown clayey sand. Non Cohesive. Wet		
19.0 '	Gray clay. Medium Plasticity. Moist.		
20.0 '			

FIGURE 12

CROSSECTIONAL OF BORING NUMBER 1361 ON PLANT 1 PAD

TOP OF PLANT 1 PAD

CONCRETE SLAB

		ppm TOTAL URANIUM	ppm TOTAL THORIUM
1.0'	Medium dense, live brown clayey sand. Trace of fine to medium gravel.	22.7	2.9
	(2 ft)	49.4	1.9
	(3 ft)	6.8	7.6
4.5'	Brown gravelled sand. Wet.		
5.0'	Brown silty clay. Trace of sand and fine gravel. Medium plasticity. Moist.		
6.0'	Loose olive brown clayey sand. Trace of fine to medium gravel. Wet.	3.1	8.8
6.5'	Olive silty clay. Trace of sand and fine gravel. Wet.	3.1	4.9
7.5'	Grayish brown to dark silty clay. Low plasticity. Moist.		
9.0'	Dark gray silty clay. Medium Plasticity. Moist.		
10.0'	Dark gray clay, trace of silt, medium plasticity, moist.		
10.5'	Olive silty clay. Low plasticity. Moist.		
11.0'	Stiff olive silty clay. Low plasticity. Moist.		
12.0'	Olive brown clayey silt. Very moist.		
13.0'	Olive brown silty sand and clayey gravel. Wet.		
13.5'	Olive brown silty clay. Trace of sand & gravel. Medium Plasticity. Moist		
14.0'	Olive brtown gravelly clay. Wet.		
15.0'			

Groundwater @ 13.5 ft.
38.6 ug/l
Nitrates - <0.1 mg/l

Table A-8

Metals Concentrations

Constituent	1345 mg/kg	1346 mg/kg
Aluminum	13300	9730
Arsenic	5.6	3.9 (single value)
Barium	115	96
Beryllium	1.1	1.4
Cadmium	4.0	4.4
Calcium	35115	67170
Chromium	20.0	23.2
Cobalt	15.9	17.4
Copper	18.3	20.6
Iron	25375	26940
Lead	16.3	16.2
Magnesium	8860	18060
Manganese	683	984
Mercury	<0.062	1.5
Nickel	37.3	48.1
Potassium	1390	870
Silver	2.8	<2.4
Sodium	108	340
Vanadium	22.1	23.5
Zinc	61.9	58.9

FIGURE 13

CROSSECTIONAL OF BORING NUMBER 1338 AT THE EDGE OF PLANT 1 PAD (OFF-PAD)

TOP OF PLANT 1 PAD

		ppm TOTAL URANIUM	ppm TOTAL THORIUM
	CONCRETE SLAB		
1.0 '	Dark brown silt. Some clay. Trace of gravel. Moist to dry.	211.0	25.0
1.5 '	Brown silt. Trace of clay Moist. (3.0 - 3.5 ')	49.0	23.0
3.0 '	Soft yellowish brown, silty clay. Some fine sand. Low plasticity Moist to saturated. (5.0 - 5.5 ')	73.0	<23.0
5.0 '	Very loose dark brown clayey sand. Moist to saturated.		
7.0 '	Medium dense, brown, poorly graded sand. Trace of fine gravel. Saturated.	Groundwater @ 6.5 ft 40.0 ug/l Nitrates - 0.10 mg/l	
9.5 '	Very stiff gray clay, Medium p;asticity. Moist.		
10.5 '		<11.0	<23.0

FIGURE 14

CROSSECTIONAL OF BORING NUMBER 1347 OFF PLANT 1 PAD

		ppm TOTAL URANIUM	ppm TOTAL THORIUM
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel & some rootlets. Damp.		
1.0 '			
	NO RECOVERY		
1.5 '			
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel. Damp.		
2.5 '			
	NO RECOVERY		
3.0'			
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel. Damp.		
4.0'			
	NO RECOVERY		
4.5'			
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel. Damp.		
5.5'			
	NO RECOVERY		
7.5'			
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel. Damp.		
8.0'			
	NO RECOVERY		
9.0'			
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel. Damp.		
10.0'			
	NO RECOVERY		
10.5'			
	Very stiff, brown silty clay, with trace of .25 - .50 in gravel. Damp.		
12.0'			
	Very stiff, gray silty clay, with trace of .25 - .50 in gravel. Damp.		
13.0'			
	NO RECOVERY		
13.5'			
	Very stiff, gray silty clay, with trace of .25 - .50 in gravel. Damp.		
14.5'			
	NO RECOVERY		
15.0'			
	Very stiff, gray silty clay, with trace of .25 - .50 in gravel. Damp.		
16.0'			
	NO RECOVERY		
16.5'			Groundwater @ 16.25 ft.
	Very stiff, gray sand-clay mixture, with trace of .25 - .50 in grave. WET.		
20.0'			Piezometer installed @ 20 ft.

FIGURE 15

CROSSECTIONAL OF BORING NUMBER 1349
AT THE EDGE OF PLANT 1 PAD
(OFF-PAD)

TOP OF PLANT 1 PAD

			ppm TOTAL URANIUM	ppm TOTAL THORIUM
	CONCRETE SLAB			
	Stiff olive silty clay. Trace of gravel. Low plasticity. Moist.		7.0	7.0
2.5 '		(2.0 - 2.5 ')	5.0	14.0
	Olive silty clay. Some sand. Low plasticity. Moist.			
		(5.0 - 5.5 ')	4.0	14.0
6.0 '	Gray brown silty clay. Medium plasticity. Moist.			
7.5 '	Stiff, grayish brown clay. Low plasticity. Moist			
		(10.0 - 10.5 ')	3.0	4.0
12.0 '	Soft brown silty clay. Low plasticity. Moist to Wet.			
14.5 '	Grayish brown clayey sand. Trace of fine gravel. Moist.	(15.0 - 15.5 ')	5.0	< 8.0
16.5 '	Clay. Trace of fine gravel and coarse sand. Medium plasticity. Moist		NO GROUNDWATER AVAILABLE	
20.0 '				

Table A-9

NON-ORGANICS & METALS in Groundwater from Monitor Wells 1055,2055, and 3055

Concentrations (mg/l)

Analyte	1055 (5/18/88)	1055 (2/26/89)	2055 (6/1/89)	2055 (6/28/89)	3055 (5/18/88)	3055 (8/3/88)	3055 (11/2/88)	3055 (3/1/89)
Aluminum			0.227	0.132				
Ammonia	0.01	0.01	1.48	0.48	<0.05	4.80	5.06	4.70
Arsenic	<0.002	<0.003	<0.002	<0.002	<0.002	<0.010	<0.002	<0.003
Barium	0.043	0.040	0.969	0.098	0.067	0.200	0.076	0.087
Cadmium	<0.002	<0.005	0.045	0.004	<0.002	<0.005	<0.002	<0.005
Calcium	118.000	130.000	110.000	123.000	104.000	160.000	197.000	200.000
Chloride	9.60	5.10	32.00	26.70	51.50	58.00	54.80	56.00
Chromium	<0.020	0.030	0.038	0.040	<0.020	<0.010	<0.020	0.030
Copper	<0.010	<0.010	<0.010	<0.010	<0.010	<0.030	<0.010	<0.010
Fluoride	0.65	0.30	0.20	0.17	0.53	<0.10	0.11	0.10
Iron	0.083	0.050	2.590	2.630	1.870	5.500	7.730	7.300
Kjeldahl N		0.70	7.18	0.58			5.71	3.90
Lead	0.002	<0.002	0.002	<.002	0.002	<0.005	<0.002	<0.002
Magnesium	36.200	38.000	27.500	29.400	29.600	28.000	34.400	34.000
Manganese	0.079	0.012	0.208	0.259	0.078	0.230	0.325	0.330
Mercury	<0.0002	0.000	0.000	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	0.033	0.010	<0.01	0.010	0.033	<0.050	<0.020	<0.010
Nickle	<0.02	<0.03	<0.02	<0.020	<0.020	<0.040	<0.020	<0.030
Nitrate	0.10	0.42	<0.10	<0.1	0.10	<2.50	<0.10	0.05
Organic Carbon			<1.00	0.45				
Organic Halides			0.02	<0.01			<0.05	
Organic N		0.60	5.70	0.10	5.95	1.80	0.65	
Phenol	0.01	0.01	0.02	<0.01	0.02	<0.01	<0.01	0.17
Phosphorous	7.40	0.13	18.90	0.09	0.13	0.03	<0.02	0.08
Potassium	1.360	1.700	4.270	3.300	53.200	3.500	17.800	24.000
Selenium	0.019	<0.005	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005
Silicon			4.853	4.950				
Silver	<0.01	<0.001	0.013	0.011	<0.010	<0.010	<0.001	<0.010
Sodium	15.100	30.000	13.600	13.400	56.800	53.000	38.700	43.000
SulfateS	259.00	250.00	123.00	133.00	159.00	340.00	217.00	360.00
SulfideS			30.20	<0.5				
Vanadium			0.019	0.018				

Table A-10

Radionuclides in Water & Core Samples
at Well Monitoring Station 55

Analyte	1055 Water (pCi/L)	2055 Water (pCi/L)	2055 Core (pCi/g)	3055 Water (pCi/L)
Strontium-90	<5.00	<5.00	<0.50	<5.00
Technetium-99	<30.00	<30.00	<0.90	<30.00
Radium-228	<3.00	<3.00	<0.80	<3.00
Thorium-228	3.70	<1.00	0.70	<1.00
	1.20			
	1.90			
Thorium-232	1.80	<1.00	<0.60	1.00
	1.00			
	1.50			
Radium-226	1.50	<1.00	0.60	1.30
Thorium-230	3.10	<1.00	1.30	1.10
			0.70	1.60
Uranium-234	9.20	1.10	0.70	<1.00
	5.90	1.50		
	4.70	0.79		
	4.80	0.71		
	4.70			
Uranium-235	<1.00	<1.00	<0.60	<1.00
	0.32			
Uranium-235	4.90	1.20	0.90	<1.00
	3.70	1.40		
	3.50	0.46		
	8.60			
	4.60			
	ug/l	ug/l	ug/l	ug/l
Total Uranium	13.00	5.00		<1.00
	22.00	2.00		
	9.00	4.00		
	9.00	3.00		
	13.80	3.00		
		2.60		
Total Thorium	7.00	<5.00		<5.00
	1.40			
	9.00			

ATTACHMENT 2
APPENDIX A
Analytical Sensitivities for Analyses Performed on Boring Samples

1,1,1 - Trichloroethane	<0.006 mg/kg
1,1,2,2 - Tetrachloroethane	<0.006 mg/kg
1,1,2 - Trichloroethane	<0.006 mg/kg
1,1 - Dichloroethane	<0.006 mg/kg
	<0.005 mg/L
1,2,4 - Trichlorobenzene	<0.42 mg/kg
1,2 - Dichlorbenzene	<0.42 mg/kg
1,2 - Dichloroethylene	<0.006 mg/kg
1,2 - Dichloroethane	<0.006 mg/kg
1,2 - Dichloroethylene	<0.006 mg/kg
1,2 - Dichloropropane	<0.006 mg/kg
1,3 - Dichlorobenzene	<0.41 mg/kg
1,4 - Dichlorobenzene	<0.42 mg/kg
2,4,6 - Trichlorophenol	<2.0 mg/kg
2,4 - Dichlorophenol	<0.42 mg/kg
2,4 - Dimethylphenol	<0.37 mg/kg
2,4 - Dinitrophenyl	<2.0 mg/kg
2,4 - Dinitrotoluene	<0.41 mg/kg
2,6 - Dinitrotoluene	<0.42 mg/kg
2 - Butanone	<0.01 mg/kg
2 - Chloronapththalene	<0.42 mg/kg
2 - Chlorophenol	<0.42 mg/kg
2 - Hexanone	<0.013 mg/kg
2 - Methylnapthalene	<0.42 mg/kg
2 - Nitroanaline	<2.0 mg/kg
2 - Nitrophenol	<2.0 mg/kg
2 - Propanone	<0.017 mg/kg
	<0.035 mg/L
3,3′ - Dichlorobenzidine	<0.84 mg/kg
3 - Nitroanaline	<2.0 mg/kg
4,4′ - DDD	<0.09 mg/kg
4,4′ - DDE	<0.09 mg/kg
4,4′ - DDT	<0.09 mg/kg

4 - Bromophenyl phenyl ether	<0.42 mg/kg
4 - Chloro-3-methylphenol	<0.42 mg/kg
4 - Chlorophenyl phenyl ether	<0.42 mg/kg
4 - Methyl-2-pentanone	0.013 mg/kg
4 - Nitrophenol	<2.0 mg/kg
Acenaphthalene	<0.42 mg/kg
Aldrin	<0.045 mg/kg
Anthracene	<0.42 mg/kg
Antimony	<7.3 mg/kg
Benzamine, 4-chloro-	<0.42 mg/kg
Benzene	<0.006 mg/kg
Benzo(a)anthracene	<0.42 mg/kg
Benzo(a)pyrene	<0.42 mg/kg
Benzo(b)fluoranthene	<0.42 mg/kg
Benzo(ghi)perylene	<0.42 mg/kg
Benzo(k)fluorantheen	<0.42 mg/kg
Benzoic Acid	<2.0 mg/kg
Benzyl Alcohol	<0.42 mg/kg
Bromodichloromethane	<0.006 mg/kg
Bromomethane	<0.013 mg/kg
Butyl benzyl phthalate	<0.42 mg/kg
Carbon Disulfide	<0.006 mg/kg
Chlorobenzene	<0.006 mg/kg
Chloroethane	<0.013 mg/kg
Chloroform	<0.006 mg/kg
Chloromethane	<0.013 mg/kg
Chrysene	<0.042 mg/kg
Cyanides	<0.32 mg/kg
Di-n-butyl phthalate/dibutyl	<0.042 mg/kg
Di-n-octyl phthalate	<0.042 mg/kg
Di-n-propylnitrosamine	<0.42 mg/kg
Dibenzo (a,h) anthracene	<0.42 mg/kg
Dibenzofuran	<0.42 mg/kg
Dibromochloromethane	<0.006 mg/kg
Dieldrin	<0.04 mg/kg

ATTACHMENT 2
APPENDIX A (cont.)

Diethylphthalate	<0.42 mg/kg
Dimethyl phthalate	<0.42 mg/kg
Endosulfan sulfate	<0.09 mg/kg
Endosulfan-I	<0.05 mg/kg
Eudosulfan-II	<0.09 mg/kg
Endrin	<0.09 mg/kg
Endrin ketone	<0.09 mg/kg
Ethylbenzene	<0.006 mg/kg
Fluoranthene	<0.42 mg/kg
Fluorene	<0.42 mg/kg
Heptachlor	<0.05 mg/kg
Heptachlor epoxide	<0.05 mg/kg
Hexachlorobutadiene	<0.42 mg/kg
Hexachlorocyclopentadiene/HC	<0.42 mg/kg
Hexachloroethane	<0.42 mg/kg
Indeno (1,2,3-cd) pyrene	<0.42 mg/kg
Isophorne	<0.42 mg/kg
Lindane\gamma-BttC\Hexachlo	<0.045 mg/kg
Methoxychlor	<0.45 mg/kg
Methylene Chloride	<0.05 mg/kg
	<0.01 mg/L
N-nitrosodiphenylamine	<0.42 mg/kg
Naphthalane	<0.42 mg/kg
Nitrobenzene	<0.42 mg/kg
PCB-1016	<0.45 mg/kg
PCB-1221	<0.45 mg/kg
PCB-1232	<0.45 mg/kg
PCB-1242	<0.45 mg/kg
PCB-1248	<0.45 mg/kg
PCB-1254	<0.90 mg/kg
PCB-1260	<0.90 mg/kg
Pentachlorophenol	<2.0 mg/kg
Phenanthrene	<0.42 mg/kg
Phenol	<0.42 mg/kg
Phenol, 2-methyl-4,6 dinitro	<2.0 mg/kg

ATTACHMENT 2
APPENDIX A (cont.)

Pyrene	<0.42 mg/kg
Styrene	<0.006 mg/kg
Tetrachloroethane	<0.006 mg/kg
	<0.005 mg/L
Tetrachloromethane	<0.006 mg/kg
Thallium	<0.84 mg/kg
Toluene	<0.007 mg/kg
	<0.005 mg/L
Total Xylenes	<0.006 mg/kg
Toxaphene	<0.9 mg/kg
Tribomomethane	<0.006 mg/kg
Vinyl Acetate	<0.013 mg/kg
Vinyl Chloride	<0.013 mg/kg
Alpha - BHC	<0.045 mg/kg
Alpha - Chlordane	<0.45 mg/kg
Beta - BHC	<0.02 mg/kg
bis (2-Chloroethyl) ether	<0.42 mg/kg
bis (2-Chloroethoxy) methane	<0.42 mg/kg
bis (2-Chloroisopropyl) ether	<0.42 mg/kg
bis (2-ethylhexyl) phthalate	<0.42 mg/kg
cis - 1,3 - dichloropropene	<0.006 mg/kg
delta - BHC	<0.018 mg/kg
gamma chlordane	<0.45 mg/kg
o-cresol	<0.42 mg/kg
p-cresol	<0.42 mg/kg
p-nitroanaline	<2.0 mg/kg
trans-1,3-dichloropropene	<0.006 mg/kg