

**G-000-711.56**

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**CONSOLIDATED CONSENT AGREEMENT/  
FEDERAL FACILITY COMPLIANCE  
AGREEMENT/FEDERAL FACILITY AGREEMENT  
MONTHLY PROGRESS REPORT PERIOD ENDING  
JUNE 30, 1992**

**06/01/92**

**DOE-FN/EPA  
175  
ENCLOSURE**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
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**Introduction**

The Consent Agreement (CA) As Amended under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 120 and 106(a), the Federal Facility Compliance Agreement (FFCA), and the Federal Facility Agreement (FFA) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA) signed September 20, 1991, July 18, 1986, and November 19, 1991, respectively, require that monthly reports be submitted to the U.S. EPA regarding progress made to meet the provisions of those agreements. This report fulfills those requirements by describing actions undertaken at the Fernald Environmental Management Project (FEMP) during the period June 1 through June 30, 1992 and planned actions for the period July 1 through July 31, 1992.

Highlights of activities in June include the following:

- All trenching, and the installation of underground pipes and water devices associated with Removal Action No. 2, Waste Pit Area Runoff Control, are complete.
- All work (on Removal Action No. 3, South Groundwater Contamination Plume, Part 1) has been completed on the three contiguous properties where access has been obtained, including all work on the CSX property.
- The Notice to Proceed on hydropunching (for Removal Action No. 3, Part 5) was approved and issued to the contractor on June 26, 1992.
- The FEMP made its first shipment of low level thorium waste during June. The shipment was made without incident (Removal Action No. 9, Removal of Waste Inventories).
- The Removal Action No. 9 compendium was updated and transmitted to both the U.S. EPA and the Ohio EPA.
- During June, the FEMP dispositioned 12,340 drum equivalents of low-level waste (against a goal of 10,340 drum equivalents for the month). This reduced the site's shipping deficit from 2,800 drum equivalents to 900 drum equivalents (Removal Action No. 9).
- Interim controls (Phase I), to provide wind and surface water run-off control at the Active Flyash Pile, and the remainder of the removal action (Phase II), were completed on June 29, 1992 (Removal Action No. 10, Active Flyash Controls).

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**Introduction (continued)**

- The Annual Procedures Update for Removal Action No. 12, Safe Shutdown, was delivered to the U.S. EPA and Ohio EPA on June 30, 1992.
- The subcontract for the ferrous metal disposition activity in Removal Action No. 15, Scrap Metal Piles, was awarded on June 19, 1992.
- The Ohio EPA conditionally approved the Uncontrolled Production Area Stormwater Runoff Work Plan on June 23, 1992 (Removal Action No. 16).
- A field investigation was conducted to determine if select locations within the Inactive Flyash Pile (Removal Action No. 23) and South Field Disposal area boundary (Removal Action No. 8) would require material to be removed. On June 24, contaminated debris from three of the regulated areas identified in the survey report were collected and placed in interim controlled storage. The contaminated items collected were a plastic bag (approximately 1 gallon) containing soil, a 1 foot x 2 feet section of transite and two small pieces of yellow material. Results of the survey were submitted to the EPAs on June 29, 1992. By removal of the debris, DOE-FN determined that no additional action is required until remediation.

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**WORK ASSIGNMENTS AND PROGRESS**

Descriptions of work progress are presented in the following sections and/or enclosures to this report:

- o CA Section IX - Removal Actions.
- o CA Section X - Remedial Investigation/Feasibility Study.
- o Enclosure A - Wastewater Flows and Radionuclide Concentrations under CA Section XXIII.B.
- o Enclosure B - FFCA: Initial Remedial Measures and Other Open Actions.
- o Enclosure C - FFA: Control and Abatement of Radon-222 Emissions.

**CA Section IX. Removal Actions**

This section provides an update of activities associated with the implementation of Removal Actions (RAs) at the FEMP during June 1992. Information is presented for each of the Removal Actions identified in the Consent Agreement As Amended.

Phase I Removal Actions

- o RA No. 1, Contaminated Water Under FEMP Buildings.
- o RA No. 2, Waste Pit Area Run-off Control.
- o RA No. 3, South Groundwater Contamination Plume.
- o RA No. 4, Silos 1 and 2.
- o RA No. 5, Decant Sump Tank.
- o RA No. 6, Waste Pit 6 Residues.
- o RA No. 7, Plant 1 Pad Continuing Release.

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**CA Section IX. Removal Actions (continued)**

Phase II Removal Actions

- o RA No. 8, Inactive Flyash Pile Control.
- o RA No. 9, Removal of Waste Inventories.
- o RA No. 10, Active Flyash Pile Controls.
- o RA No. 11, Pit 5 Experimental Treatment Facility.
- o RA No. 12, Safe Shutdown.
- o RA No. 13, Plant 1 Ore Silos.
- o RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator.
- o RA No. 15, Scrap Metal Piles.
- o RA No. 16, Collect Uncontrolled Production Area Runoff--Northeast.
- o RA No. 17, Improved Storage of Soil and Debris.
- o RA No. 18, Control Exposed Material in Pit 5.

Phase III Removal Actions

- o RA No. 19, Plant 7 Dismantling.
- o RA No. 20, Stabilization of UNH Inventories.
- o RA No. 21, Expedited Silo 3.
- o RA No. 22, Waste Pit Area Containment Improvement.
- o RA No. 23, Inactive Flyash Pile.
- o RA No. 24, Pilot Plant Sump.

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**CA Section IX. Removal Actions (continued)**

- o RA No. 25, Nitric Acid Tank Car and Area.
- o RA No. 26, Asbestos Removals (Asbestos Program).
- o RA No. 27, Management of Contaminated Structures at the FEMP.

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**RA No. 1, Contaminated Water Under FEMP Buildings**

Plant 6 - Pumping and collection of the perched water from underneath Plant 6 began on May 31, 1991. Through June 1992, approximately 21,560 gallons of perched groundwater have been extracted and transported for treatment to the Plant 8 VOC treatment system.

Plants 2/3 and Plant 8 - The Plants 2/3 and Plant 8 extraction systems became operational on October 23, 1991. Through June 1992, approximately 87,650 gallons of perched water have been collected for treatment from Plant 2/3 and approximately 61,420 gallons of perched water have been collected for treatment from Plant 8. Direct piping to the Plant 8 treatment system from the Plant 2/3 wells was completed in May 1992.

Plant 9 - Pumping from Plant 9 began on August 20, 1991. Approximately 18,355 gallons of Plant 9 perched water have been extracted and transported to Plant 8 through June 1992.

Plant 8 - The startup date for the Plant 8 treatment system was July 24, 1991. Through June 1992, approximately 183,775 gallons of groundwater have been transported and treated utilizing the Plant 8 treatment system.

All activities to support the deliverables identified in the three U.S. EPA approved Removal Action Work Plans have been completed. Pumping of perched water beneath the four plants will continue in accordance with the Work Plan provisions. Meetings were held in June to transfer this removal action to Operable Unit 5. The official transfer date is July 1, 1992.

**RA No. 2, Waste Pit Area Runoff Control**

The Work Plan for the Waste Pit Area Runoff Control Removal Action was approved with modifications by the U.S. EPA on January 10, 1991. Conditional approval was received from the Ohio EPA on April 2, 1991.

Construction activities have been ongoing since June 6, 1991. All construction sequences for the Waste Pit Area Runoff Control Removal Action are completed.

Activities in June included construction acceptance testing and approval of the sump and pump station. All trenching, and installation of underground pipes and water devices were completed.

Planned activities for July include the completion of punch list items, completion of site maintenance procedures (if required), and completion of the project's administrative requirements.

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**RA No. 2, Waste Pit Area Runoff Control (continued)**

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Completion of construction	Open, on schedule	July 31, 1992

**RA No. 3, South Groundwater Contamination Plume**

**Part 1**

The Work Plan for Part 1, Alternate Water Supply for two industrial users (Albright & Wilson and Delta Steel) was approved by the U.S. EPA on January 3, 1991. Subsequently, Delta Steel was deleted from the current scope of the project with approval of the U.S. EPA and Ohio EPA. A revised Work Plan (Revision 1) was prepared and issued to the EPAs to reflect this and other changes which have occurred. A summary of the most recent and ongoing activities for Part 1 are listed below:

- A draft letter was received from the U.S. EPA on June 18, 1992, approving the response to comments on the Part 1 Work Plan, Revision 1, and Revision 2 of the Work Plan Attachment "Pre-Excavation Field Screening and Soil Sampling and Analysis Plan." Responses will be incorporated into a revised Work Plan.
- Supplemental information in support of the previously submitted request for schedule extension was submitted to U.S. EPA on June 4, 1992. This letter provided further explanation as outlined in U.S. EPA's letter of May 27, 1992. U.S. EPA approved the extension of the completion date for Part 1 from July 14, 1992, to December 7, 1992 by letter on June 25, 1992.
- All work has been completed on the three contiguous properties where access has been obtained, including all work on the CSX property. The contractor has stopped work until August 28, 1992, pending acquisition of the remaining needed properties via condemnation.

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**RA No. 3, South Groundwater Contamination Plume (continued)**

**Part 2**

To expedite the Part 2 construction, this project was divided into four construction bid packages. These include: 2A - Groundwater discharge pipeline (pressure flow) and outfall pipeline (gravity flow) from south of Willey Road to and including Manhole 183B, 2B - Manhole 183B to Great Miami River (2B1) and aeration facility (2B2), 2C - Recovery well field, and 2D - Test well installation and pump test. Part 2 follow-on activities include:

- A draft letter was received from the U.S. EPA on June 18, 1992, that approved the response to comments on the Part 2/3 Work Plan pending incorporation of two attached comments. Responses will be incorporated into a revised Work Plan.
- A construction kickoff meeting was held June 22, 1992 for Package 2A - Discharge Pipeline. Work will begin the week of July 6 at Manhole 183B and will proceed upstream from east to west.
- Construction contract bids on Package 2B.1 - Outfall Cofferdam are due July 14.
- The 100% design package for Package 2B.2 - Dissolved Oxygen was issued June 17, 1992, for review. Comments are due July 8.
- The 100% design review package for Package 2C - Wellfield and 2D - Test Well is out for review. Comments are due July 10.

**Part 3**

The Work Plan for Part 3 (the installation and operation of an IAWWT System to reduce uranium contaminant loading discharged to the Great Miami River to a level less than 1,700 pounds per year) was prepared as one work plan with Part 2. Due to the relocation of the Part 2 well field to an area having a higher concentration of uranium, the IAWWT system capacity was expanded in order to maintain the 1,700 pound per year maximum level. The IAWWT system will include two treatment units. The IAWWT unit located at the Storm Water Retention Basin (IAWWT[SWRB]) will consist of two trailer-mounted assemblies, each with a nominal 150 gpm capacity or a total nominal 300 gpm capacity and the unit located at the Bionitrification Treatment/Effluent Treatment System (IAWWT[BDN-ETS]) will have a nominal capacity of 100 gpm.

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**RA No. 3, South Groundwater Contamination Plume (continued)**

**Part 3 (continued)**

Current activities in this area are as follows:

- The first IAWWT(SWRB) process equipment trailer was delivered to the site June 10, 1992. The second equipment trailer was delivered on June 23, 1992. These have been put into place. Installation of piping and electrical interfaces are in process.
- Construction work is on schedule for the IAWWT(BDN-ETS) portion of Part 3. The construction acceptance walkthrough was conducted on June 25, 1992.

**Part 4**

Part 4 of the South Groundwater Contamination Plume Removal Action Work Plan involves groundwater monitoring and institutional controls.

Installation of the Culligan ion exchange water treatment system occurred on June 18, 1992, at two private residences where a common well has been affected by the South Groundwater Contamination Plume. In follow-up contacts, the residents noted that they are concerned about the reduced water pressure in their homes resulting from the smaller water supply pipe size used in plumbing the system. Culligan is being contacted to see if this problem can be corrected.

**Part 5**

Part 5 was added to the South Plume in order to address the relocation of the Part 2 well field. Part 5 includes groundwater modeling and geochemical investigation of the area south of the well field to determine if 20 ppb uranium concentration in groundwater is present downgradient of the Part 2 well field.

Notice to Proceed on hydropunching was approved and issued to the contractor on June 26, 1992. Hydropunching will be initiated for this effort by July 9, 1992 and all locations should be completed (except CSX) by July 31, 1992. Upon gaining access to CSX, the additional hydropunching for this project will be completed.

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**No. 3, South Groundwater Contamination Plume (continued)**

Work in July for RA No. 3, Parts 1 - 5 will focus on beginning field construction on Part 2A; completing Certified-for-Construction (CFC) packages on Parts 2B and 2C; completing field work on Part 3, training unit operators, obtaining startup approvals, and starting up operations of both units; addressing property owners' concerns regarding water pressure (Part 4); beginning field installation of the north and south rows of Part 5 hydropunching; and revising Part 5 Work Plan to reflect recent changes and reissuing it to regulators for approval.

**RA No. 4, Silos 1 and 2**

Installation of the bentonite in Silos 1 and 2 was completed on November 28, 1991. This was ahead of the scheduled commitment date of December 1, 1991.

A Silos 1 and 2 Removal Action, Bentonite Effectiveness Environmental Monitoring Plan, that describes the methodology and computer model that will be used to determine the effectiveness of the bentonite in attaining the .015 pCi/l goal was submitted to the U.S. EPA on January 27, 1992. On February 19, 1992, the plan was disapproved by the U.S. EPA. The remaining issues on calculating the conversion from measured headspace radon concentration to flux from the dome were addressed in the revised document submitted on March 13, 1992. Draft comments concerning specific parameters used in the calculations were received from the U.S. EPA on March 31, 1992. U.S. EPA and Ohio EPA approval of the Bentonite Effectiveness Environmental Monitoring Plan was received on April 24, 1992. On May 22, 1992, the Bentonite Effectiveness Environmental Monitoring Report was transmitted to U.S. EPA.

Calibration and checkout of the data logging system continued in June. The data logging system will automatically record data for Silos 1 and 2 headspace radon monitoring, Silos 1 and 2 headspace humidity monitoring, Silos 1 and 2 temperature and pressure monitoring, and four K-65 area exclusion radon gas monitors.

Work in July will include continuation of the calibration and checkout of the data logging system and the preparation of the Bentonite Effectiveness Environmental Monitoring Report for data collected in June.

As defined in the Removal Action Work Plan and the Federal Facility Agreement, data associated with monitoring the effectiveness of the bentonite installation is included in Enclosure C.

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**RA No. 4, Silos 1 and 2 (continued)**

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Complete installation of bentonite slurry into Silos 1 and 2	Completed November 28, 1991	December 1, 1991
Submit Bentonite Monitoring Plan	Completed January 27, 1992	January 27, 1992
Report monitoring results for bentonite effectiveness to EPA - 1st run 4/92	Completed May 22, 1992	May 22, 1992

**RA No. 5, K-65 Decant Sump Tank**

Removal of the liquid from the K-65 decant sump tank was completed on April 16, 1991 when the liquid was transferred to the holding tanks in Plant 2/3.

The analytical results for the general water quality parameters, Hazardous Substances List (HSL) volatile organics, HSL semi-volatile organics, and HSL pesticide organics and inorganics were received for the decant liquid taken during the implementation of the Removal Action. A Materials Evaluation Form (MEF), with the available analysis, was completed to determine the required treatment of the decant liquid. The liquid pumped from the K-65 decant sump tank was treated by the FEMP Wastewater Treatment Facility. Treatment of the decant liquid based on the MEF and available analytical results was completed on May 12, 1992.

Work in July 1992 will include preparing Removal Action final report.

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Complete the removal of the liquid from the K-65 decant sump tank	Completed April 16, 1991	April 26, 1991

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**RA No. 6, Waste Pit 6 Residues**

This removal action was completed on December 19, 1990. The only remaining issue related to the Waste Pit 6 Exposed Material Removal Action involved the placement of air monitors to augment the site requirements for estimating the off-site releases of potentially harmful contaminants. The installation of the air monitors is substantially complete. Of the four air monitors, three are completed and ready to operate. The fourth is completed and is ready for energizing its electric power.

**RA No. 7, Plant 1 Pad Continuing Release**

This removal action consists of three phases. Phase I, which implements the run-on/off control measures, is complete. Phase II addresses the installation of 80,000 square feet of a newly covered and controlled concrete storage pad. Phase III involves activities to upgrade the remaining 375,000 square feet of the existing Plant 1 storage pad. The Phase III upgrading activities include installation of a polymeric vapor barrier over the existing concrete and the installation of concrete above the barrier with an epoxy sealant. In addition, 22,000 square feet of the Phase III work area will be enclosed beneath a tension structure.

Activities in June included the continued installation of the Phase II pad by the construction contractor. Installation of the Phase II pad is 55% complete. Implementation for the post-excavation sampling of the Phase II area was complete in June.

Activities in July will include the delivery of at least one, possibly two, tensor support structures, and the continuation of installation of the Phase II pad.

KEY MILESTONES	STATUS	DUE DATE
Complete Phase I	Completed January 17, 1992	March 13, 1992
Complete Phase II	Open, on schedule	December 21, 1992
Complete Phase III	Open, on schedule	February 21, 1995

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**RA No. 8, Inactive Flyash Pile Control**

The Inactive Flyash Pile Isolation Activity, which involved the installation of a plastic chain link barrier and the posting of warning signs, was completed ahead of schedule on December 23, 1991.

**RA No. 9, Removal of Waste Inventories**

During June 1992, 12,340 drum equivalents (DE) of low-level waste (LLW) were dispositioned. The June goal for shipments was 10,340 DEs. This reduced the FEMP LLW shipping deficit from 2,800 DEs to about 900 DEs. The FY1992 cumulative total LLW shipped is 74,704 DEs.

KEY MILESTONES	STATUS	DUE DATE
Update existing internal procedures to ensure that appropriate shipping documentation is entered into the administrative record file	Completed on June 30, 1992 (To be updated annually)	June 30, 1992

The FEMP made its first shipment of low level thorium waste during June. The shipment was made without incident.

The RA No. 9 compendium was updated and transmitted to both the U.S. EPA and the Ohio EPA on schedule on June 30, 1992.

The Nevada Test Site (NTS) Waste Application to ship waste has been revised to incorporate DOE-NV comments and distributed for internal approval.

Activities for July include continuing Low Level Thorium Waste shipments, shipping 9,356 DEs of LLW, and transmitting the NTS Waste Application to DOE/NV for final approval.

**RA No. 10, Active Flyash Pile Controls**

The Work Plan for the Active Flyash Pile Controls Removal Action was completed and submitted ahead of schedule to the U.S. and Ohio EPAs on February 18, 1992. Comments from the Ohio EPA were received on March 18. U.S. EPA approval of the Plan was received on March 30. Resolution of these comments and a revised version of the Work Plan were transmitted to the EPAs on April 29.

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**RA No. 10, Active Flyash Pile Controls (continued)**

The design of this removal action was completed in April. A construction contractor was selected on May 29, 1992. Interim controls (Phase I), to provide wind and surface water run-off control at the Active Flyash Pile, and the remainder of the removal action (Phase II), were completed on June 29, 1992. Any required maintenance will be conducted on an ongoing basis.

KEY MILESTONES	STATUS	DUE DATE
Submit Active Flyash Pile Work Plan to the U.S. EPA for approval	Completed February 18, 1992	March 2, 1992
Phase I - Complete interim surface stabilization	Completed June 29, 1992	June 30, 1992
Phase II - Complete Active Fly Ash Pile Controls.	Completed June 29, 1992	October 28, 1993

**RA No. 11, Pit 5 Experimental Treatment Facility**

RA No. 11 was completed. The removal of the contents, structure, and filter material for the Experimental Treatment Facility (ETF) was completed 22 days ahead of schedule. Demobilization of the ETF Project has been completed. It was backfilled and capped, using a clay cover.

Activities for June included the receipt of sample results for the vegetation and the waste material.

Planned activities for July include the completion of results from the soils surrounding the ETF and the issuance Removal Action Final Report for internal review.

KEY MILESTONES	STATUS	DUE DATE
Complete removal action within 120 days of Work Plan approval	Completed March 20, 1992	April 11, 1992

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**RA No. 12, Safe Shutdown**

The Safe Shutdown Removal Action documents the ongoing shutdown activities that will remove uranium and other process/raw materials from equipment and pipe lines in areas of formerly used processing equipment and will properly disposition the removed materials off site.

KEY MILESTONES	STATUS	DUE DATE
Update existing internal procedures to ensure that appropriate documentation is entered into the administrative record file	Completed June 30, 1992 (To be updated annually)	June 30, 1992

The Annual Compendium of Procedures Update was delivered on schedule on June 30, 1992 to the U.S. and Ohio EPA.

The preliminary assessments for each major process area are continuing. Plants 1, 2/3, 4, 8, and 9 have been completed. Plants 5, 6, and the Pilot Plant are in rough draft form.

Inventorying of expense equipment items continued; 2,303 expense items are currently in the data base; 669 have been field verified, 578 are on a "shopping list" to ascertain on-site use, 27 have been transferred to Maintenance, and 55 have been placed on AC-563 forms to be excessed.

The capital equipment inventory continued. Of an estimated 1,396 total number of items, 1011 have been put on AC-563 forms to be excessed, and 385 have been identified as "In Use/Future Use" items. The capital equipment disposition task is 88% completed.

Relocation of Building 51 capital equipment and expense items, which began in March, is continuing. This equipment is being relocated to allow the Advanced Waste Water Treatment (AWWT) project to proceed. The task to isolate and remove the equipment is approximately 85% completed.

The effort to prepare the task specific Health and Safety Plan for Safe Shutdown is ongoing. The first draft has been issued for internal review.

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**RA No. 12, Safe Shutdown (continued)**

The project to transfer the remaining 4A metal inventory from the Fernald Environmental Management Project (FEMP) to the Defense Consolidation Facility in Snelling, South Carolina, was delayed this month due to a drum incident on June 17, 1992. Due to hydrogen build-up, the lids popped on a drum of 219 Material (spill metal) that was being transported from the 4A Warehouse for loading on the rail cars. This resulted in a moratorium on the shipment of drummed 4A material. A task team was formed and is working on a resolution to the hydrogen issue. Since the three rail cars that had been loaded contained all drummed material, they are being held pending resolution of the hydrogen build-up problem. However, permission was received to handle very specific categories of drummed materials and noncontainerized, palletized materials. One car has been loaded with palletized material, another is in progress, and it is expected these will leave the week of July 6. This total project will result in the removal of approximately 2,838 MTU of metal from the FEMP (approximately 6,300,000 net pounds).

The project to transfer selected pieces of the derby breakout and slag milling systems to the Department of the Army for relocation at Aerojet Ordnance Tennessee is on hold. Aerojet is conducting a six-week study to determine their technology needs and will be in contact with the Army to get a better picture of future defense requirements in light of the changing global situation.

Twenty-two shipments have been made against Materials Disposition Order D-777 (transfer of  $UF_4$  to the Department of the Army). The schedule slipped a week on this order due to the moratorium on drum handling. Total shipped as of June 30, 1992, is 272 metric tons uranium (MTU). The balance remaining to be shipped is 68 MTU. Concurrence has been received from the Department of the Army and Aerojet to run over approximately 6 MTU to avoid a partially loaded truck at the end of the project. This project should be complete July 17, 1992.

Concurrence was received from Facilities and Materials Evaluation that all of the lots of thorium pending sale to Atomegic are non-RCRA, and a letter was written to the Office of Counsel confirming that status. This confirmation is important in support of the sale.

Preparation of the Safety Analysis Report (SAR) by Parsons is at 60% draft review.

Documentation in support of the Risk Assessment Report for the Safe Shutdown Program has been assembled for task team evaluation.

Planned activities for July include distributing Risk Assessment documentation to the task team, continuing the capital equipment disposition effort, continuing  $UF_4$  shipments to the Department of the Army, and continuing the transfer of 4A metal from the site.

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**RA No. 13, Plant 1 Ore Silos**

The Plant 1 Ore Silos Removal Action will include the dismantling of the Plant 1 Ore Silos and their support structure. This dismantling will eliminate the potential threat of additional material releases and the safety hazard due to structural deterioration of the silos and their support structure. The activities in this removal action will include characterization, removal, containerization, and disposal of the materials making up the above ground portion of the facility.

Comments on the Removal Action Work Plan were received from the U.S. EPA on February 27, 1992. The revised Removal Action Work Plan was submitted to the U.S. EPA on March 27, 1992. Conditional approval of the Work Plan was received from the Ohio EPA on April 13, 1992 and U.S. EPA on May 18, 1992. June activities included comment resolutions and revisions to the Work Plan. July activities will include resubmittal of the revised Work Plan. A pre-bid meeting is scheduled for early July, with the receipt of bids due in late July. The contract is forecast to be awarded in August.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U. S. EPA	Completed January 9, 1992	January 10, 1992
Submit Revised Work Plan to the U.S. EPA	Completed March 27, 1992	March 30, 1992
Complete design.	Completed May 6, 1992.	June 18, 1992
Initiate field activities.	Open, on schedule.	October 18, 1992
Complete Removal Action	Open, on schedule.	December 20, 1994

**RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator**

This removal action will include the isolation or removal and disposition of contaminated soils in the vicinity of the Sewage Treatment Plant (STP). This will eliminate the potential threat of additional material releases to the environmental media through migration. The activities in this removal action will include characterization, removal, containerization, and storage/disposal of the materials.

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**RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Inclinerator (continued)**

Comments on the Work Plan were received from the U.S. EPA on February 28, 1992. The revised Work Plan was resubmitted to the U.S. EPA on March 30, 1992. Conditional approval of the Work Plan was received from the U.S. EPA on May 18, 1992. June activities included comment resolutions and revisions to the Work Plan. July activities will include resubmittal of the revised Work Plan. July activities will include the initiation of field activities.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Completed January 23, 1992	January 23, 1992
Submit Revised Work Plan to the U.S. EPA	Completed March 30, 1992	March 30, 1992
Resubmit Revised Work Plan to the U. S. EPA	Open, on schedule	July 15, 1992
Phase I - Completion of walkover survey and excavation of hot spots.	Open, on schedule.	August 18, 1992
Phase II - Complete post excavation and submit interim reports.	Open, on schedule.	April 18, 1993
Phase III - Revise RSE and submit final report.	Open, on schedule.	July 18, 1993

**RA No. 15, Scrap Metal Piles**

The Scrap Metal Piles Removal Action will detail the stabilization and disposition of LLW scrap metal currently stockpiled onsite. This Removal Action will eliminate the potential threat of additional material releases to the environment. Approximately 1,300 tons of scrap copper along with approximately 3,000 tons of recoverable scrap metals are the focus of this Removal Action.

Comments on the Work Plan were received from the U.S. EPA on March 4, 1992. The revised Work Plan was resubmitted to the U.S. EPA on April 3, 1992. Conditional approval of the Work Plan was received from the U.S. EPA on May 18, 1992. June activities included comment resolutions and revisions to the Work Plan. The subcontract for the ferrous metal disposition activity was awarded on June 19, 1992. July activity will include the preparation of the subcontractor Removal Action Project Plan.

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**RA No. 15, Scrap Metal Piles (continued)**

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Submit Work Plan to the U.S. EPA	Completed January 31, 1992	January 31, 1992
Submit Revised Work Plan to the U.S. EPA	Completed April 3, 1992	April 3, 1992
Phase I - Award of contract	Completed June 19, 1992	June 30, 1992
Phase I - Submit Subcontractor's Removal Action Project Plan	Open, on schedule.	September 30, 1992
Phase I - Complete	Open, on schedule.	March 30, 1994
Phase IIA - Initiate Containerization	Open, on schedule.	March 30, 1994

**RA No. 16, Collect Uncontrolled Production Area Runoff – Northeast**

The scope of this removal action is to collect the remaining stormwater from the perimeter of the 136 acre production area that currently discharges to Paddy's Run and divert it through the existing storm sewer system to the Storm Water Retention Basin.

The Ohio EPA conditionally approved the Uncontrolled Production Area Stormwater Runoff Work Plan on June 23, 1992. Conditions for approval are that DOE must satisfactorily address the comments as defined in the June 23 letter, regarding the definition of mixed waste.

Work in July will concentrate on issuing the CFC package for bid, and addressing Ohio EPA and U.S. EPA comments on the Work Plan for Removal Action No. 16.

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**RA No. 16, Collect Uncontrolled Production Area Runoff – Northeast (continued)**

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Submit Work Plan to the U.S. EPA	Completed March 2, 1992	March 2, 1992
Complete Removal Action	Open, on schedule	August 30, 1993

**RA No. 17, Improved Storage of Soil and Debris**

This removal action will include the management and appropriate storage for contaminated soil and debris onsite. This will eliminate the potential threat of additional material releases to the environment due to wind, rain, or vehicular traffic. The activities in this Removal Action will include characterization, interim storage, and management of the contaminated soil and debris materials until the final remediation under Operable Unit 3.

June activities included continued preparation for the initiation of Phase I activity and initiation of containment structure design. July activities will include comment resolutions and revisions to the Work Plan pending receipt of EPA comments.

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Submit Work Plan to the U.S. EPA	Completed March 25, 1992	March 25, 1992
Receive U.S. EPA comments on the Work Plan	Open	April 24, 1992
Submit Revised Work Plan to the U.S. EPA	Open	Pending receipt of U.S. EPA comments

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**RA No. 18, Control Exposed Material in Pit 5**

The Control Exposed Material in Pit 5 Removal Action is being developed and implemented using a phased approach. This phased approach considers and utilizes information obtained from the liner repair activities, the pit berm investigation, which addresses the overall pit structural integrity, and the significance and magnitude of potential and actual emissions from the waste pit. The schedule for this Removal Action is currently being revised to reflect the current philosophy for accomplishing the scope. An Alternatives Evaluation identified the dredge method as the most viable means to transfer material within Pit 5.

Activities in June included the preparation of the Supplemental Alternatives Evaluation, and development of response to the Ohio EPA and U.S. EPA comments on the Removal Action Work Plan.

Planned activities for July include resolving Ohio EPA and U.S. EPA comments and issuance of the Revised Removal Action Work Plan and continuing design work.

KEY MILESTONES	STATUS	DUE DATE
Submit a Removal Action Work Plan to the U.S. EPA and the Ohio EPA	Completed March 26, 1992	March 30, 1992

**RA No. 19, Plant 7 Dismantling**

The Plant 7 Dismantling Removal Action will include decontamination and dismantling of the Plant 7 structure. This dismantling will eliminate the potential threat of additional material releases and the safety hazard due to histoplasmosis. The activities in this removal action will include characterization, decontamination, removal, containerization, and disposal of the materials making up the above ground portion of the facility.

June activities included continued work for preparation of the Characterization Plan and initiation of project functional requirements. July activities will include design kickoff and scope and review of the Characterization Plan.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	April 20, 1993

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**RA No. 20, Stabilization of UNH Inventories**

The Stabilization of UNH Inventories Removal Action will remove and prepare for safe storage approximately 230,000 gallons of acidic UNH that is currently stored in 21 tanks in and around Plant 2/3. Existing processing equipment will be used to neutralize the solutions, filter the precipitate, and package the resulting filter cake in double containment for safe storage. This activity was previously part of RA No. 12, Safe Shutdown, but is being accelerated as a separate expedited response.

Activities in June included completion of additional classroom training and operator on-the-job training, approval of the PTA and Health and Safety Plan, and completion of the Operational Readiness Review.

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
System Integrity Testing	Completed February 13, 1992	February 13, 1992
Submit Flow Charts to the U.S. EPA	Completed April 8, 1992	March 31, 1992
Commence Processing Material	Completed July 6, 1992	July 6, 1992
Finish Processing Material	Open	Schedule being developed

**RA No. 21, Expedited Silo 3**

On December 13, 1991, an Action Memorandum was issued to initiate an expedited removal action. The Silo 3 Removal Action mitigated the potential release of material to the environment and included the following actions:

- All obvious openings in the dust collector hopper were covered and sealed.
- The dust collector was removed.
- All obvious pathways for release were capped or covered.

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**RA No. 21, Expedited Silo 3 (continued)**

Implementation of the Removal Action was initiated on December 20, 1991. The material within the dust collector hopper exposed to the environment was stabilized on December 21, 1991. Loose equipment on the silo dome was removed.

KEY MILESTONES	STATUS	DUE DATE
Complete removal of the dust collector on Silo 3 dome	Completed January 8, 1992	January 15, 1992

Work in July will center on completion and submittal of the Material Evaluation Form and disposition of the equipment removed from Silo 3. Determining the applicability of the metal oxide material as hazardous waste by definition of the Resource Conservation and Recovery Act will also be completed in July.

**RA No. 22, Waste Pit Area Containment Improvement**

A Removal Site Evaluation (RSE) was prepared in 1991 and submitted to DOE. This RSE is presently being updated to include information on the Berm for Pit 4 and the Burn Pit cap. The Action Plan to address the Waste Pit Area Roads and Exposed Surfaces was transmitted to DOE on February 24, 1992. This Action Plan is now being used as the basis for developing a Work Plan.

The schedule for the Waste Pit Area Containment Improvements is being revised to reflect the current project scope.

Activities for June included the development of the complete scope, review of the Alternatives Evaluation, and the preparation of the Work Plan for the Removal Action.

Planned activities for July include final issuance of the Alternatives Evaluation and issuance of the draft Removal Action Work Plan to DOE on July 22, 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	August 31, 1992

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**RA No. 23, Inactive Flyash Pile**

A field investigation was conducted to determine if select locations within the Inactive Flyash Pile and South Field Disposal area boundary (RA No. 8) would require material to be removed. On June 24, contaminated debris from three of the regulated areas identified in the survey report were collected and placed in interim controlled storage. The contaminated items collected were a plastic bag (approximately 1 gallon) containing soil, a 1 foot x 2 feet section of transite and two small pieces of yellow material. Results of the survey were submitted on June 29, 1992. By removal of the debris, DOE-FN determined that no additional action is required until remediation.

**RA No. 24, Pilot Plant Sump**

This sump is located on the southwest side of the Pilot Plant. The sump consists of a stainless steel cylinder approximately two feet in diameter and ten feet deep. This sump was built to remove liquids from the floor drains of the Pilot Plant and was actively used only during the renovation of the Pilot Plant in 1969.

The sump is filled with a thick liquid and sludge. Analytical results of the sump contents show high concentrations of metals: lead, copper, chromium, nickel, as well as thorium and volatile organic compounds. June activities included the submittal of the Removal Site Evaluation and the Work Plan to DOE. July activities will include comment resolution and submittal of the revised Work Plan to the EPAs. Additionally, the "pump out" of accumulated water from the sump will be initiated in July.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	July 31, 1992

**RA No. 25, Nitric Acid Tank Car and Area**

The Nitric Acid Rail Car is located on the northern perimeter of the production area and east of Building 63. The FEMP RCRA Part A and Part B application identify this tank car and area surrounding it as a Hazardous Waste Management Unit.

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**RA No. 25, Nitric Acid Tank Car and Area (continued)**

This high-grade, stainless steel tank car has a capacity of approximately 100,000 pounds and measures approximately 10 feet wide x 40 feet long x 15 feet high. This unit operated from 1952 until about 1989. The tank car stored nitric acid used at the FEMP. Based on recent analysis, the tank car now contains 50-100 gallons of nitric acid.

This Removal Action includes removal of residual contents from the tank car followed by the tank car's decontamination and dispositioning, as well as characterizing and subsequent excavation and disposition of the nearby soils for contaminants related to the tank car.

July activity will include initiation of Removal Site Evaluation and Work Plan preparation.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	October 30, 1992

**RA No. 26, Asbestos Removals (Asbestos Program)**

This removal action documents ongoing asbestos abatement activity at the FEMP to mitigate the potential for contaminant release and migration. Abatements within the Asbestos Program include in-situ repairs, encasement, and encapsulation as well as removals.

Work Procedures for this Removal Action were submitted in May. Activities in July will involve continuing field activities in asbestos material identification and abatement.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Procedures to the U.S. EPA	Completed May 19, 1992	May 19, 1992
Update existing internal procedures to ensure that appropriate documentation is entered into the administrative record file	To be updated annually	June 30, 1993

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**RA No. 27, Management of Contaminated Structures at the FEMP**

Submit EE/CA study to identify alternatives for managing contaminated structures; document the selection of a response(s) that will mitigate the potential threat to workers, the general public, and the environment associated with these structures; and, address health and environmental impacts associated with the proposed action. June activities included 30% progress review of EE/CA. Activities in July will include continued document preparation, the preparation of a scope and methodology briefing to be presented at the July Program Manager's meeting, 60% progress review meeting, and 90% document preparation.

<b>KEY MILESTONES</b>	<b>STATUS</b>	<b>DUE DATE</b>
Submit Engineering Evaluation/Cost Analysis (EE/CA) to the U.S. EPA to support Proposed Removal Actions for Managing Contaminated Structures	Open, on schedule	December 15, 1992

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**1.0 Operable Unit 1**

Operable Unit 1, as defined in the Amended Consent Agreement, includes Waste Pits 1 - 6, Clearwell, Burn Pit, berms, liners and soil within the operable unit boundary.

**1.1 Field Investigation**

**1.1.1 13-Well Program**

**Scope:**

The 13 wells were installed into Waste Pits 1 - 4 and the Burn Pit. Waste samples were collected at various locations during boring operations and analyzed for Hazardous Substance List (HSL) parameters and characteristic radionuclides. Wells were developed and sampled to determine constituents of concern in the waste pit leachate.

**Status:**

All waste pit wells have been sampled per the approved work plan. Laboratory analysis was completed on all Operable Unit 1 samples in February. Data validation and entry into the RI/FS database are ongoing.

**Issues/Corrective Actions:**

None to report.

**1.1.2 Radon Sampling Program**

**Scope:**

The Radon Sampling Program was initiated in an effort to develop a representative measurement of radon releases from the waste pit area. The data will be used to support National Emission Standards for Hazardous Air Pollutants (NESHAP) compliance and Remedial Investigation/Feasibility Study (RI/FS) characterization requirements. The program consists of a one-time measurement of radon release using large area activated charcoal collectors (LAACC). Approximately 100 LAACCs were placed on Waste Pits 1, 2, and 3. The LAACCs were left on the pits for 24 hours and then removed and analyzed. Continuous ambient air radon monitoring was also conducted during the period.

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**1.1.2 Radon Sampling Program (continued)**

**Status:**

The radon sampling is complete for Waste Pits 1, 2 and 3. The data has been evaluated and a draft report has been issued.

As a result of a discussion with U.S. EPA on May 27, 1992, concerning the issue of sampling Pits 4, 5 and the Clearwell, it was determined that Pit 4 will need to be sampled in addition to Pits 1, 2 and 3. Pit 5 and the Clearwell will not be sampled at this time.

**Issues:**

On May 27, 1992 a conference call was held with the U.S. EPA to determine if radon flux measurements should be taken for Pits 4, 5 and the Clearwell. At the request of U.S. EPA, radon sampling of the Pit 4 vents will be performed along with a few representative samples from the Pit 4 cap. Radon sampling for Pit 5 will not have to be conducted if the removal action to control emissions is completed as scheduled.

**Corrective Actions:**

Install Pit 4 radon flux measurement devices.

**1.1.3 Pits 5 and 6 and the Clearwell Sampling Program**

**Scope:**

The objectives of the Pits 5, 6, and Clearwell Sampling Program are to obtain sufficient quantities of samples for treatability studies and to provide additional Resource Conservation and Recovery Act (RCRA) characterization information on the waste pits. The pits were sampled using a clamshell and crane.

**Status:**

The sampling of Pits 5, 6, and the Clearwell is complete. These samples have been shipped to the treatability laboratory where stabilization testing is ongoing.

**Issues/Corrective Actions:**

None to report.

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**1.2 Treatability Studies**

**Scope:**

The Operable Unit 1 treatability studies will evaluate the two treatment process options identified in the Operable Unit 1 Initial Screening of Alternatives document, cement stabilization and vitrification. The technical feasibility of these technologies will be evaluated by conducting a series of experiments on both composite waste samples and individual strata samples. Ranges of formulations will be investigated as will other performance criteria such as compressive strength, leachability, bulking factor and permeability. For cement stabilization, binding agents that will be evaluated include portland cement, flyash, and sodium silicate. Clay (attapulgite and clinoptilolite) will be added to reduce the leachability of metals in the waste. Glass formers and modifiers being considered for vitrification are flyash, soil, and sodium hydroxide.

The stabilization testing will consist of two phases, the preliminary phase being reagent range-finding experiments using composite samples, and the advanced phase consisting of testing on strata samples. Within each phase are two stages permitting additional reagent testing as necessary. An optional phase to evaluate waste form durability, radon emanation, and radon leaching is also being considered.

**Status:**

Preliminary phase Stage I is complete. Preliminary phase Stage II molds for Pits 1, 2, 3, 4, and 5 have been made and are curing. Stage II will not be performed on Pit 6 since the Stage I testing provided adequate results. Molds are being prepared for the Clearwell and Burn Pit.

All preliminary phase Stage I vitrification melts have been completed using additives to the waste. Additives tested include waste pit area soil, site flyash and sodium silicate. The Nuclear Waste Glass Product Consistency Tests (PCT) on leachate were completed on May 29, 1992, and the results are being incorporated into report format at this time. The MTCLP tests began on May 28, 1992.

**Issues:**

The delay in collecting samples from Pits 5, 6, and the Clearwell will impact the treatability study schedule unless additional actions are taken as proposed.

Mixtures of site flyash and waste produced a corrosive material during vitrification tests. The mixture corroded several of the platinum/gold crucibles being used.

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**1.2 Treatability Studies (continued)**

**Corrective Actions:**

A schedule recovery plan has been implemented to maintain schedule milestones supporting preparation of the Treatability Study Report.

The advanced stages of treatability testing will proceed on Pits 1, 2, 3, 4, and the Burn Pit material without waiting for completion of preliminary testing on Pits 5, 6, and the Clearwell. As preliminary stage testing on Pits 5, 6, and the Clearwell material are completed, they will proceed to the advanced stages of treatability testing.

**1.3 Remedial Investigation**

**Scope:**

A RI Report will be prepared in accordance with the U.S. EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA Directive 93553-01) and the approved Risk Assessment Work Plan Addendum.

The first activities scheduled for the RI are field data collection and analysis. The objective of the field data analysis activity is to evaluate the preliminary data available from field measurements while awaiting results of lab analysis.

**Status:**

The revision of the waste pit cross sections was completed in March. The actual depths of the waste pit bottoms are within three to six feet of the earlier projections. The exception to this finding is the Burn Pit, where the actual bottom depth is approximately 10 feet deeper than originally projected. The analysis of waste and area contamination has been initiated but is being delayed by data acquisition problems.

**Issues:**

Delays in completion of data validation and entry into the database are slowing evaluation of the RI data and delaying the submission of the draft RI Report.

As a result of a recent inspection of seven Operable Unit 1 monitoring wells, it was observed that staining and minor water leakage are occurring. The wells were installed in 1985 by a previous contractor. As a result of the potential leakage the wells will be evaluated further to determine if they should be removed from service.

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**1.3 Remedial Investigation (continued)**

**Corrective Actions:**

Additional staff have been assigned to assist in completion of data validation and entry into the database. Work is proceeding on non-data-related tasks such as field program descriptions and text editing. A recovery plan is in progress for RI production.

A CCB package is being constructed requesting funding for the removal of all defective wells from service.

**OU 1 REMEDIAL INVESTIGATION REPORT**

**PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants within the Operable Unit 1 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	10/12/93 C 04/20/93 F	12/11/93 C 06/13/93 F	01/10/94 C 07/16/93 F

C = Consent Agreement Date

F = Forecast Complete

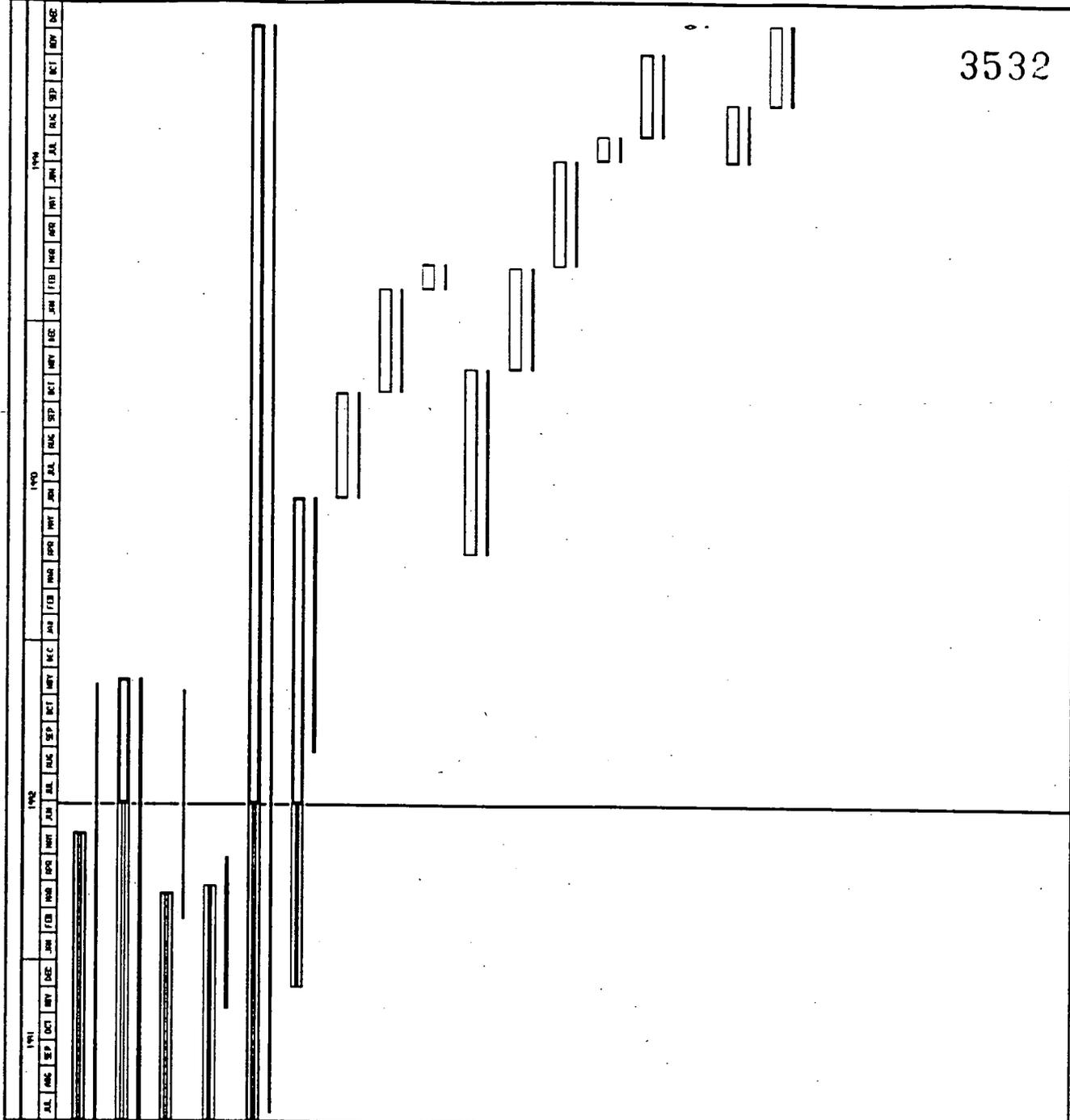
A = Actual

**1.4 Planned Activities for July 1992**

Complete data validation and 90% verification of database entries for the 13-well program.

Continue the preliminary phase of cementation and vitrification treatability testing.

Continue preparation of the draft RI Report and recovery schedule.



OPERABLE UNIT 1 RELATED FIELD ACTIVITIES	AS 1MAR91 AF 25MAY92
UNIT 13 WELL PROGRAM	AS 1MAR91 LF 19NOV92
UNIT RADON FLUX PROGRAM	AS 23MAY91 AF 18MAR92
PHI 5, 6, AND CLEARWELL SAMPLING PROGRAM	AS 1JUL91 AF 27MAR92
UNIT TREATABILITY STUDIES	AS 30APR91 LF 5DEC94
UNIT REMEDIAL INVESTIGATION REPORT PREPARATION	AS 2DEC91 LF 14JUN93
DOE UNIT 1 REVIEW/REVISE/APPROVE	LS 15JUN93 LF 11OCT93
EPA UNIT 1 REVIEW & APPROVE	LS 13OCT93 LF 7FEB94
PRINT AND DISTRIBUTE FINAL UNIT 1 RI REPORT	LS 8FEB94 LF 7MAR94
UNIT FEASIBILITY STUDY/PROPOSED PLAN PREP	LS 12APR93 LF 8NOV93
DOE UNIT FS/PP REVIEW/REVISE/APPROVE	LS 9NOV93 LF 4MAR94
EPA UNIT FS/PP REVIEW/REVISE/APPROVE	LS 7MAR94 LF 4JUL94
PRINT AND DISTRIBUTE FINAL UNIT 1 FS RPT/PP	LS 5JUL94 LF 1AUG94
UNIT PUBLIC COMMENT	LS 2AUG94 LF 3NOV94
SUBMIT UNIT DRAFT ROD TO EPA	LF 6DEC94
UNIT DRAFT ROD PREPARATION	LS 4JUL94 LF 7SEP94
DOE UNIT DRAFT ROD REVIEW/REVISE/APPROVE	LS 7SEP94 LF 6DEC94

3532

Date	Revision	Checked	Approved

Sheet 1 of 1  
 Date: 28JUN92  
 Print name: cjh/m

RI/FS PROGRAM CURRENT  
 FERNALD ENVIRONMENTAL MGMT. PROJECT  
 FEMP RI/FS UNIT 1 CONSENT AGMT (LATE)

Activity Bar/Late Date  
 Critical Activity  
 Program Bar  
 Legend Bar as of 18F90

Project Start: 10C190  
 Project Finish: 31AUG98

Prattware Systems, Inc. 1989-1991

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
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**2.0 Operable Unit 2**

Operable Unit 2, as defined in the Amended Consent Agreement, includes the Flyash Piles, other South Field disposal areas, lime sludge ponds, solid waste landfill, berms, liners, and soil within the operable unit boundary.

**2.1 Field Investigation**

**2.1.1 19-Boring/Well Program**

**Scope:**

This program provides additional characterization of the individual waste units within Operable Unit 2. Borings are located in both Flyash Piles, the Solid Waste Landfill and the South Field. If leachate is encountered during boring operations, wells will be installed and sampled. Sampling and characterization of standing water in the north Lime Sludge Pond is also included in the program.

**Status:**

All field characterization activities associated with the original work plan have been completed. The analytical results from the original program have been received, validated, and evaluated as per the work plan and data user requirements.

Additional sampling was required which was caused in part by incomplete testing of certain parameters for samples taken in the Active and Inactive Flyash Piles, the Solid Waste Landfill, and the South Field, or due to suspected matrix effects on several parameters.

Various parameters required analysis from these locations during the additional sampling, including TCLP volatile and semivolatile organic compounds, HSL, Appendix IX, full radiological, total organic carbon, and simulated rainwater leaching procedure (SRLP).

A Work Plan Addendum was written for extracting the additional samples; the additional borings were advanced in the areas indicated and the samples were taken and sent to the contract laboratory where analysis on the chemical and radiological parameters was completed during April 1991.

**Issues/Corrective Actions:**

None to report.

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**2.1.2 Additional HSL Parameters Sampling Program**

**Scope:**

This program provides for collection of samples from four shallow borings in the South Field. These samples are to be analyzed for HSL parameters to supplement the limited data available for this area.

**Status:**

All sample collection activities have been completed in prior months. Laboratory analyses for the additional sampling and subsequent HSL laboratory analysis have been completed.

Four additional samples were taken during June 1991 to augment the data set as part of the recent resampling effort described in Section 2.1.1.

**Issues/Corrective Actions:**

None to report.

**2.2 Treatability Studies**

**Scope:**

The purpose of this study is to provide additional information to support the FS and subsequent remedy selection for Operable Unit 2. Specifically, the study will demonstrate whether stabilization can achieve the desired level of material strength (an unconfined compressive strength [UCS] of approximately 500 psi), as well as obtain quantitative leaching data for geochemical modeling and subsequent computer modeling of groundwater contaminant transport. The study is composed of two parts: two preliminary phases (to support remedy screening) and an advanced phase (to support remedy selection). The preliminary phase involves evaluating a range of stabilization mix formulations in order to determine a representative formulation which meets the desired strength criteria. The advanced phase involves performing tests on stabilized waste using representative formulations determined in the preliminary phases.

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**2.2 Treatability Studies (Continued)**

**Status:**

All TCLP results were received and validated during March 1992. Permeability testing was completed during April. Preparation of the Treatability Study Report was initiated in March, completed in early May, and submitted for WEMCO/DOE-FN review on May 11, 1992. Comments were received on June 10, 1992. Incorporation and resolution of these comments continued throughout the month of June. A comment resolution meeting with WEMCO/DOE-FN is scheduled for July 1, and the report is scheduled for submittal to the U.S. EPA and the Ohio EPA on July 14, 1992.

**Issues/Corrective Actions:**

None to report.

**2.3 Remedial Investigation**

The purpose of the RI is to provide a summary of the field investigations and to support the FS by defining the nature and extent of the contaminants in the Operable Unit 2 study area; estimating the volume of contaminated media and materials; and providing a baseline risk assessment which establishes remedial action objectives (RAOs).

**Status:**

The draft RI Report was completed and submitted for site and DOE-HQ review on May 18, 1992. Official comments were received by ASI/IT on June 18, 1992. Review and resolution of the comments continued throughout the month of June. A comment resolution meeting with WEMCO/DOE-FN is scheduled for July 1, 1992. This will support the next expected submittal of the RI Report to DOE-HQ on August 14, 1992.

**Issues:**

A schedule recovery plan has been implemented to minimize the impact from data validation delays. Consent Agreement delivery dates are not impacted. The final validated Operable Unit 2 data set was available on June 15, 1992 and will be used in all subsequent versions of the RI Report.

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**2.3 Remedial Investigation (Continued)**

**Corrective Action:**

The schedule recovery plan calls for the following major points:

- Incorporation of WEMCO/DOE-FN/DOE-HQ review comments from June 18 to August 7 (including baseline risk assessment recalculations using the final Operable Unit 2 validated data package).
- Internal ASI/IT review begins on August 7.
- Submittal for formal DOE-HQ review on August 14.
- Incorporation of comments from September 14 to October 13.
- Submittal to the U.S. EPA and the Ohio EPA on October 14.

**OU 2 REMEDIAL INVESTIGATION REPORT**

**PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants within the Operable Unit 2 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	10/19/92 C 10/14/92 F	12/17/92 C 12/17/92 F	01/14/93 C 01/11/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**2.4 Feasibility Study**

The purpose of the FS is to evaluate alternatives in detail with respect to the nine evaluation criteria developed by the U.S. EPA. The alternatives are analyzed individually against each criterion and then compared against one another to determine their respective strengths and weaknesses and to identify the key tradeoffs that must be balanced for the site.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**2.4 Feasibility Study (Continued)**

**Status:**

The characterization review and alternative assessment were initiated in February 1992. The process of reviewing and updating applicable or relevant and appropriate requirements (ARARs) was initiated in March. Fate and transport model development and data analysis in support of the FS risk assessment (RA) were initiated in May.

**Issues:**

Delays in completing the Operable Unit 2 baseline RA have impeded FS-RA activities, with a potential impact to subsequent FS activities.

**Corrective Actions:**

A complete FS recovery plan will be completed in July.

**OU 2 FEASIBILITY STUDY REPORT**

**PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Describes and analyzes potential remedial alternatives. A comparative analysis is performed for all alternatives.	03/15/93 C	05/13/93 C	06/13/93 C
	03/12/93 F	05/13/93 F	06/09/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

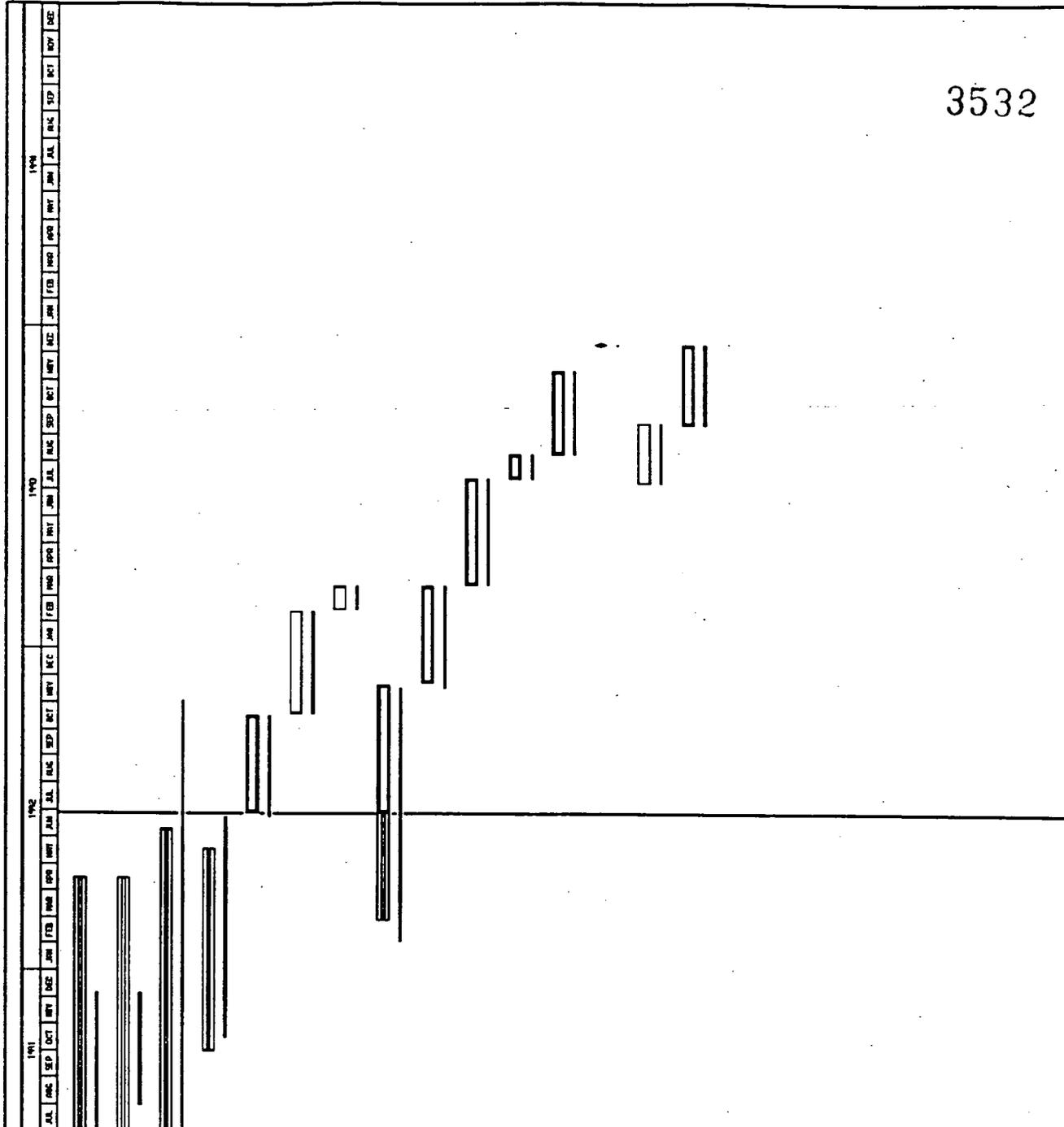
**2.5 Planned Activities for July 1992**

Complete incorporation of WEMCO/DOE-FN comments into the Treatability Study Report and submit to DOE on July 13, 1992 for transmittal to the U.S. EPA and the Ohio EPA on July 14, 1992.

Continue incorporation of WEMCO/DOE-FN/DOE-HQ comments into the RI Report.

Begin FS RA activities, evaluation of alternatives for effectiveness and implementability, and continue alternative cost estimates for the FS Report.

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OU2 19 WELL PROGRAM AS 1MAR91 AF 15APR92
OU2 ADDITIONAL HSL SAMPLING PROGRAM AS 1JUL91 AF 15APR92
OU2 TREATABILITY STUDIES AS 1APR91 AF 10JUN92
OU2 REMEDIAL INVESTIGATION REPORT PREPARATION AS 1OCT91 AF 18MAY92
DOE OU2 RI REV. EW/REVISE/APPROVE LS 29JUN92 LF 16OCT92
EPA OU2 RI REV. EW & APPROVE LS 20OCT92 LF 12FEB93
PRINT AND DISTRIBUTE FINAL OU2 RI REPORT LS 15FEB93 LF 12MAR93
OU2 FEASIBILITY STUDY/PROP PLAN PREP AS 28FEB92 LF 20NOV92
DOE OU2 FS/PP REVIEW/REVISE/APPROVE LS 23NOV92 LF 12MAR93
EPA OU2 FS/PP REVIEW/REVISE/APPROVE LS 15MAR93 LF 12JUL93
PRINT AND DISTRIBUTE FINAL OU2 FS/PP LS 13JUL93 LF 9AUG93
OU2 PUBLIC COMMENT LS 10AUG93 LF 10NOV93
SUBMIT OU2 DRAFT ROD TO EPA LF 10DEC93
OU2 DRAFT ROD PREPARATION LS 8JUL93 LF 13SEP93
DOE OU2 DRAFT ROD REVIEW/REVISE/APPROVE LS 13SEP93 LF 10DEC93

Prepared by RB/IT Corp.

Sheet 1 of 1

RI/FS PROGRAM CURRENT  
FERNALD ENVIRONMENTAL MGMT. PROJECT  
FEMP RI/FS OU2 CONSENT AGMT (LATE)

Activity Bar: [ ]  
Critical Activity: [ ]  
Program Bar: [ ]  
Target Dates as of 18CT90: [ ]

Project Start: 10CT90  
Project Finish: 31AUG98

Date: 28JUN92  
Plot Date: 6JUL92

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**3.0 Operable Unit 3**

Operable Unit 3 as defined in the Amended Consent Agreement includes the Production Area and production associated facilities and equipment (includes all above - and below-grade improvements) including, but not limited to, all structures, equipment, utilities, drums, tanks, solid waste, waste product, thorium, effluent lines, K-65 transfer lines, wastewater treatment facilities, fire training facilities, scrap metal piles, feed stocks, and coal pile.

**3.1 Initial Scoping/Work Plan Revisions**

Operable Unit 3 initial scoping/work plan revision activities in June included identification of potentially applicable decontamination and dismantlement technologies, development of required field instrument survey, sample collection and laboratory analytical procedures, and development of Operable Unit 3 component-specific field implementation procedures (FIPs). U.S. EPA and Ohio EPA comments on the Operable Unit 3 RI/FS Work Plan Addendum are due on August 1, 1992.

**OU3 WORK PLAN ADDENDUM**

**WORK PLAN**

SCOPE	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
The work plan/appendices will include an initial evaluation of Operable Unit 3 (e.g., conceptual models, waste/contaminant quantities), a work plan rationale (e.g., data requirements, SAP approach) and specific Operable Unit 3 RI/FS tasks.	08/01/92 C 07/24/92 F	08/24/92 C 08/24/92 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**3.2 Issues/Corrective Actions**

None to report.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**3.3 Planned Activities for July 1992**

Continue preparation for development of FIPs.

Continue development of required Operable Unit 3 field instrument survey, sample collection, and laboratory analytical procedures.

Continue research on potentially applicable decontamination and dismantlement technology types/process options.

Receive and begin incorporation of U.S. EPA and Ohio EPA comments on Operable Unit 3 RI/FS Work Plan Addendum.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**4.0 Operable Unit 4**

Operable Unit 4, as defined in the Amended Consent Agreement, consists of Silos 1, 2, 3, and 4, the silo berms, the Decant Tank System, and soil within the operable unit boundary.

**4.1 Field Investigation**

**4.1.1 Slant Borings**

**Scope:**

Five slant or angled borings were advanced beneath Silos 1 and 2 and the decant sump tank.

**Status:**

All sampling activities and laboratory analysis of the samples have been completed. All analytical results have been validated and entered into the RI/FS database.

**Issues/Corrective Actions:**

None to report.

**4.1.2 Vertical Borings:**

**Scope:**

Four vertical borings were advanced into the earthen berms of Silos 1 and 2 to identify contaminants transported from the silos in the area of the slurry transfer decant ports.

**Status:**

All sampling activities and laboratory analysis of the samples have been completed. Data validation and database entry are complete.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**4.1.2 Vertical Borings: (Continued)**

**Issues:**

During examination of the sample validation results, it was determined that three samples from three of the four vertical borings were inadvertently not analyzed during the initial sampling operations. The missed samples were to be collected at the 10-foot interval of the first third of Borings 1620, 1622, and 1623 and analyzed for full radiological parameters.

**Corrective Actions:**

The contract laboratory has completed the analysis of the samples that were retrieved from archive storage and submitted for analysis for the missed parameters at the indicated intervals.

**4.1.3 Silos 1 and 2 Contents:**

**Scope:**

Silos 1 and 2 contents were sampled from three of the four manways at each silo. The contract laboratory completed the analysis for the Silos 1 and 2 samples in January 1992.

**Status:**

All sampling activities and laboratory analyses of the samples have been completed. Data validation is complete. Evaluation of validation results and database entry have been completed.

**Issues/Corrective Actions:**

None to report.

**4.2 Treatability Studies**

**Scope:**

The purpose of a treatability study work plan is to provide additional information to support the FS and subsequent remedy selection for Operable Unit 4. There are two separate treatability work plans/studies to support the Operable Unit 4 FS. One study considers cement stabilization of Silos 1, 2, and 3 material and chemical extraction, leachate stabilization, and leachate purification of Silos 1 and 2 material. The second treatability study considers the vitrification of Silos 1, 2, and 3 material.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**4.2 Treatability Studies (Continued)**

The Treatability Study Work Plan (for cementation and chemical extraction) will demonstrate whether stabilization can achieve a desired level of material strength, provide information to help determine the effectiveness of chemical extraction, and to provide data for use in fate and transport modeling. The study is composed of three preliminary phases and an advanced phase. The preliminary phases will determine the potential reagents and conditions for stabilization and/or extraction on composites of the silo material. The advanced phase will evaluate the material variability by testing formulations and/or extraction on the top, middle, and bottom layers from each silo.

The Treatability Study Work Plan for the Vitrification of Residues from Silos 1, 2, and 3 considers vitrification of silo material, radon emanation rate from the vitrified waste, and the leachability of the vitrified waste.

**Status:**

Stabilization testing supporting the treatability study continued in June.

Silos 1, 2 and 3 - Advanced Phase - Stabilization molds have been cracked and UCS tests were acceptable. TCLP analysis is in progress. There are 12 samples and two quality assurance (QA) samples for Silo 1 and 2 material and two samples and a QA sample for Silo 3 material. These 5-day static leach tests are complete and analysis is in progress.

Chemical Extraction tests - The preliminary phase Stage I of the precipitation experiments were completed. Data evaluation is in progress for determination of Stage 2 experiments.

Vitrification Treatability Tests - Benchscale test equipment has been installed and system checkout is complete. The PNL Vitrification Benchscale Test Plan was approved and glass formulations were developed for the 100 g. benchscale test melts. The first 100 g. test melt for K-65 material was completed. A modified TCLP analysis of the vitrified waste is in progress.

The database for treatability sample tracking is operating properly.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**4.3 Remedial Investigation Report**

**Scope:**

The purpose of the RI is to provide a summary of the field investigations and to support the FS by defining the nature and extent of the contaminants in the Operable Unit 4 study area; estimating the volume of contaminated media and materials; and providing a baseline RA, which establishes remedial action objectives.

**Status:**

Activities continued on the Operable Unit 4 RI during June. Analyses continued on the field data collected during the characterization program. New figures are being generated depicting the Silos 1 and 2 subsoil slant borings and vertical berm borings. Tables summarizing the slant and vertical boring data and the Silos 1, 2 and 3 content data are proceeding. Technical evaluations of the data are ongoing. The baseline RA modeling for Silo 3 contents is continuing.

**Issues:**

Delays in completion of data validation and entry into the database has delayed evaluation of the RI data, as reported in the May monthly report. No impact to the Consent Agreement delivery date for the RI is anticipated.

**Corrective Action:**

A recovery plan has been initiated to ensure the RI will be completed and delivered per Consent Agreement dates.

**OU4 REMEDIAL INVESTIGATION REPORT**

**PRIMARY**

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE/HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants in the OU4 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	12/21/92 C 10/15/92 F	02/17/93 C 12/14/92 F	04/19/93 C 02/11/93 F	06/18/93 C 04/13/93 F	07/18/93 C 05/11/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**4.3 Remedial Investigation Report (continued)**

Continuing activities include evaluation of the field and analytical data, revising previous drafts of the RI, creating new figures and tables, and initiation of the RA model for Silo 3.

**4.4 Feasibility Study**

**Scope:**

The purpose of the FS is to evaluate alternatives in detail with respect to the nine evaluation criteria developed by the U.S. EPA. The alternatives are analyzed individually against each criterion and then compared against one another to determine their respective strengths and weaknesses and to identify the key tradeoffs that must be balanced for the site.

**Status:**

The revision of alternatives as they were described in the U.S. EPA-approved Initial Screening of Alternatives proceeded during June at the direction of DOE-FN and is designed to provide separate alternatives for the different waste media. For example, alternatives to disposition Silos 1 and 2 contents are being created; alternatives for Silo 3 contents only are being revised; silo structures, berms and subsoils are being grouped in another set of alternatives; and Silo 4 is being dispositioned in separate alternatives. Disposal options and locations, both on-property and off-site, were discussed with WEMCO and DOE-FN during June and are being included as appropriate to the alternatives. Alternative revisions are ongoing.

**Issues/Corrective Actions:**

None to report.

**OU4 FEASIBILITY STUDY**

**PRIMARY**

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE/HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Describes and analyzes potential remedial alternatives. A comparative analysis is performed for all alternatives.	05/14/93 C 04/28/93 F	07/13/93 C 06/25/93 F	09/09/93 C 08/24/93 F	11/10/93 C 10/25/93 F	12/09/93 C 11/19/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**4.5 Planned Activities for July, 1992**

Continue revisions to the RI Report. Initiated baseline RA modeling for Silos 1 and 2 contents.

Continue revision of FS alternatives.

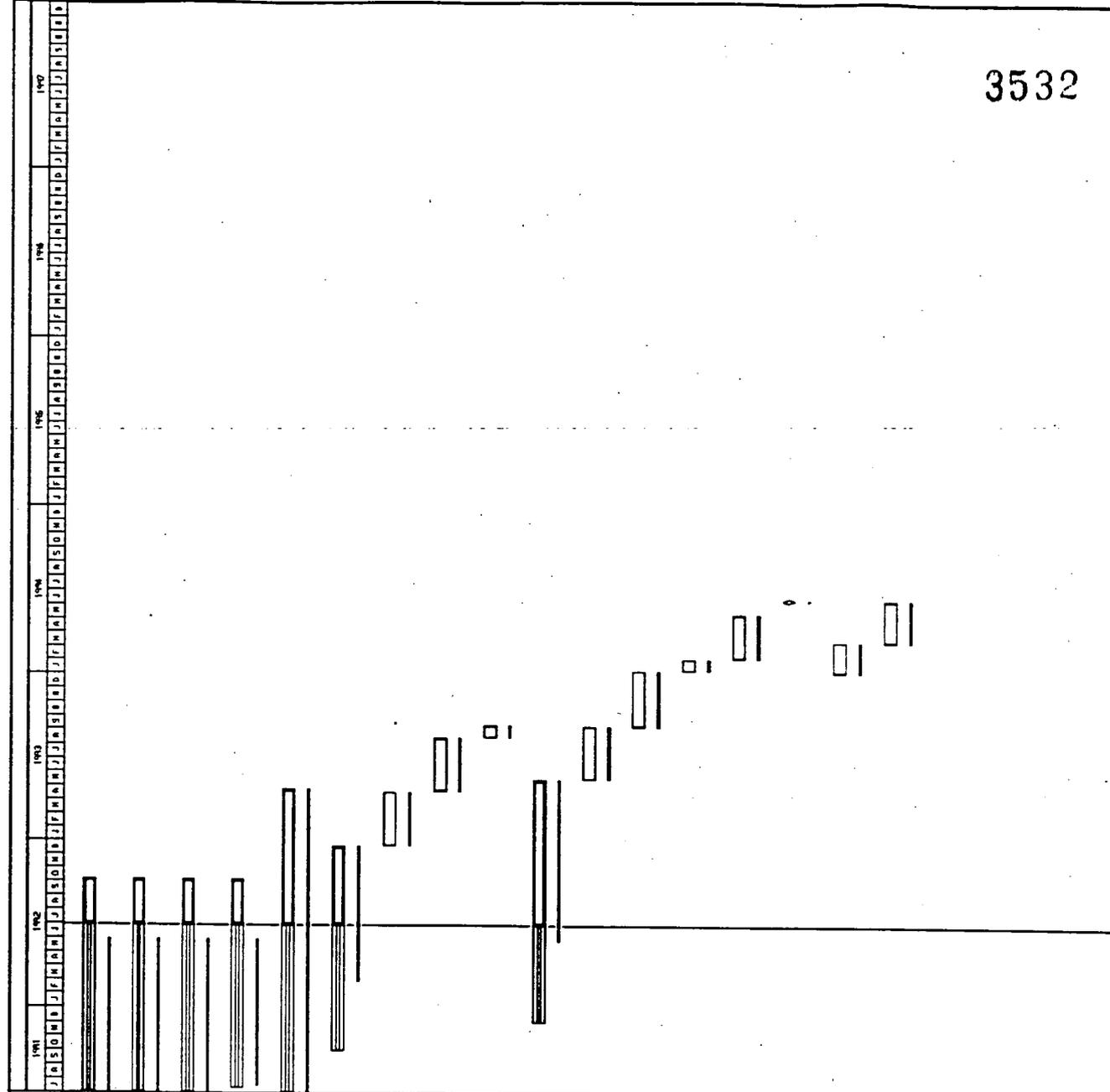
Cement stabilization treatability testing will continue with the advanced phase molds.

Chemical extraction treatability testing will continue. Stabilization and vitrification will begin for wash solutions.

Vitrification on extractant solutions from chemical extraction testing will be initiated.

Vitrification benchscale testing of the silo content material will continue for Silos 1, 2, and 3.

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OPERABLE UNIT 4 RELATED FIELD ACTIVITIES AS 15JAN91 LF 50CT92
OU4 FIELD ACTIVITY - SLANT BORINGS AS 25JAN91 LF 50CT92
OU4 FIELD WORK - VERTICAL BORINGS AS 15JAN91 LF 50CT92
OU4 FIELD WORK - CONTENT SAMPLING AS 12JUL91 LF 50CT92
OU4 TREATABILITY STUDIES AS 18JAN91 LF 23APR93
OU4 REMEDIAL INVESTIGATION REPORT PREPARATION AS 10CT91 LF 18DEC92
DOE OU4 RI REVIEW/REVISE/APPROVE LS 21DEC92 LF 16APR93
EPA RI REVIEW & APPROVE LS 20APR93 LF 13AUG93
PRINT AND DISTRIBUTE FINAL RI REPORT LS 16AUG93 LF 10SEP93
OU4 FEASIBILITY STUDY/PROPOSED PLAN PREP AS 20DEC91 LF 14MAY93
DOE OU4 FS/PP REVIEW/REVISE/APPROVE LS 17MAY93 LF 9SEP93
EPA OU4 FS/PP REVIEW/REVISE/APPROVE LS 10SEP93 LF 7JAN94
PRINT AND DISTRIBUTE FINAL OU4 FS/PP REPORT LS 10JAN94 LF 4FEB94
OU4 PUBLIC COMMENT LS 2FEB94 LF 11MAY94
SUBMIT OU4 DRAFT ROD TO EPA LF 10JUN94
OU4 DRAFT ROD PREPARATION LS 6JAN94 LF 14MAR94
DOE OU4 DRAFT ROD REVIEW/REVISE/APPROVE LS 14MAR94 LF 10JUN94

Prepared by: RL/DJ Corp.

Date	Revision	Checked	Approved

Sheet 1 of 1

RI/FS PROGRAM CURRENT  
FERNALD ENVIRONMENTAL MGMT. PROJECT  
FEMP RI/FS OU4 CONSENT AGMT (LATE)

Activity Schedule Data:  
 Critical Activity: [ ]  
 Prepare For: [ ]  
 Target Dates as of: 10/1/90

Project Start: 10CT90  
Project Finish: 31AUG98

Data Date: 28JUN92  
Plot Date: 6JUL92

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**5.0 Operable Unit 5**

Operable Unit 5, as defined in the Amended Consent Agreement, includes groundwater, surface water, soil not included in the definitions of Operable Units 1 - 4, sediments, flora, and fauna.

**5.1 Field Investigation**

**5.1.1 Paddy's Run South (Seepage Investigation)**

**Scope:**

This investigation consists of the installation of twelve 2000-series wells along Paddy's Run, south of the FEMP, with the contingency to install twelve 3000-series wells, sample the wells monthly for one year, perform stream gauge and stream infiltration measurements, and perform surface-water sampling.

**Status:**

All activities have been completed (still awaiting analytical results from one well).

**Issues/Corrective Actions:**

None to report.

**5.1.2 Facilities Testing**

**Scope:**

This investigation consists of systematic and focused borings within the FEMP production area and additional suspect areas. Piezometers are installed in those borings in which water is encountered.

**Status:**

Complete.

**Issues/Corrective Actions:**

None to report.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**5.1.3 31-Well Program**

**Scope:**

This investigation consists of defining the limits of uranium plumes in the southern area of the FEMP.

**Status:**

All sampling activities associated with this task have been completed. Laboratory analysis for the collected samples was completed.

**Issues/Corrective Actions:**

None to report.

**5.1.4 8-RCRA Well Program**

**Scope:**

Eight wells were installed to meet RCRA and RI/FS requirements in and around the FEMP waste storage area.

**Status:**

All sampling activities associated with this task have been completed. Laboratory analysis for the collected samples was completed.

**Issues/Corrective Actions:**

None to report.

**5.1.5 Miscellaneous Additional Wells Program**

**Scope:**

Sixteen additional wells are being installed to fill data gaps defined through recent sampling activities.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**5.1.5 Miscellaneous Additional Wells Program (continued)**

**Status:**

Installation of all planned wells under this program is complete. All groundwater sampling activities associated with this task are now complete. Laboratory results for total dissolved uranium concentrations from the first round of groundwater sampling were completed. No further contingency wells are required under this program.

**Issues/Corrective Actions:**

None to report.

**5.1.6 OU5 Work Plan Addenda (Formally Auger and Cable Tool Sampling Program)**

**Scope:**

Soil and perched groundwater sampling will be conducted in the following areas under this program: the Plant 1 Pad, the Southeast Quadrant of the Production Area, the Fire Training Area, the KC-2 Warehouse Area, Scrap Metal Area and Electrical Substation, and the K-65 Slurry Line and Clearwell Line.

**Status:**

The addendum was transmitted to the U.S. EPA and the Ohio EPA in April 1992 for review and approval. Comments have been received from the Ohio EPA and U.S. EPA and are being reviewed.

Field characterization of the K-65 Slurry and Clearwell Line portion of the Work Plan continued. The first round of groundwater sampling for HSL volatiles, general water quality, and full radiological parameters has been completed for ten existing wells (1150, 1154, 1167, 1206, 1207, 1208, 1213, 1215, 1226, 1237)

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**5.1.6 OU5 Work Plan Addenda (Formally Auger and Cable Tool Sampling Program)  
(continued)**

Nine new wells are scheduled to be installed according to the current Work Plan for this task as follows:

- 1836 Installation started.
- 1837 Installation completed.
- 1838
- 1839
- 1840
- 1841 Installation completed.
- 1842 Installation completed.
- 1843 Installation completed.
- 1844 Installation completed.

**Issues/Corrective Actions:**

None to report.

**5.2 Treatability Study**

**Scope:**

The purpose of this study is to provide information to support the FS and subsequent remedy selection for Operable Unit 5. Specifically, the study will demonstrate the feasibility of soil washing as a remedial technology for cleaning soils in Operable Unit 5. The study incorporates a physical/chemical treatment process that initially involves the separation of a soil into different particle-size fractions. Reagent formulations in the washing solutions are used in the extraction of radionuclides and organic and inorganic compounds from these different-size fractions. The contaminants may be separated from the wash stream into a concentrated residue for further treatment. The study consists of two stages: remedy screening involving laboratory and bench-scale tests and remedy selection using pilot-scale equipment.

**Status:**

DOE-FN received a letter from U.S. EPA dated June 22, 1992, agreeing with the revised comment responses to the work plan. These comment responses are being incorporated into the final revised Treatability Study Work Plan. The anticipated completion date for the revised work plan is July 1992.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**5.2 Treatability Study (continued)**

**Issues:**

There were no significant levels of detectable semivolatile analytes in ID-A and ID-B soil samples. A variance is, therefore, being issued requesting that these semivolatile analytes not be targeted in Stage 1 of this study. Remedy screening testing for Stage 1 ID-B soil (Plant 1 Pad) is nearing completion. Remedy screening testing for Stage 1 ID-A soil (incinerator area soils) is currently underway. Treatability study gas chromatographs for remedy screening have been ordered. However, delays in procurement of these instruments may affected holding time constraints for targeted semivolatile analytes in upcoming Operable Unit 5-A and Operable Unit 5-B soil samples.

**Corrective Actions:**

Expedite procurement of instruments to minimize delays.

**OU5 TREATABILITY STUDY WORK PLAN**

**WORK PLAN**

SCOPE	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides scope of treatability studies for Operable Unit 5 soil treatment technologies including lab procedures and test evaluation criteria.	05/18/92 C 01/14/92 A	06/05/92 C 03/04/92 A

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**5.3 Initial Screening of Alternatives**

**Scope:**

The Initial Screening of Alternatives Report will document the initial activities of the FS. These activities include: developing remedial action objectives; developing general response actions; identifying volumes or areas of media to which response actions might be applied; identifying and screening technologies; identifying and evaluating technology process options; assembling selected representative process options into alternatives; and performing an initial screening of the alternatives.

**Status:**

The comments received from the DOE site office resulted in a decision to restructure the Initial Screening of Alternatives; the Report is currently being revised for submittal to DOE-HQ on July 15, 1992.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**5.3 Initial Screening of Alternatives (Continued)**

**Issues/Corrective Actions:**

None to report.

**OU5 INITIAL SCREENING OF ALTERNATIVES**

**PRIMARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides for initial evaluation against preselected criteria of candidate technologies assembled to remediate Operable Unit 5.	04/16/93 C 11/10/92 F	06/15/93 C 01/03/93 F	07/15/93 C 02/05/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

Document preparation is proceeding ahead of the Consent Agreement schedule.

**5.4 Planned Activities for July 1992**

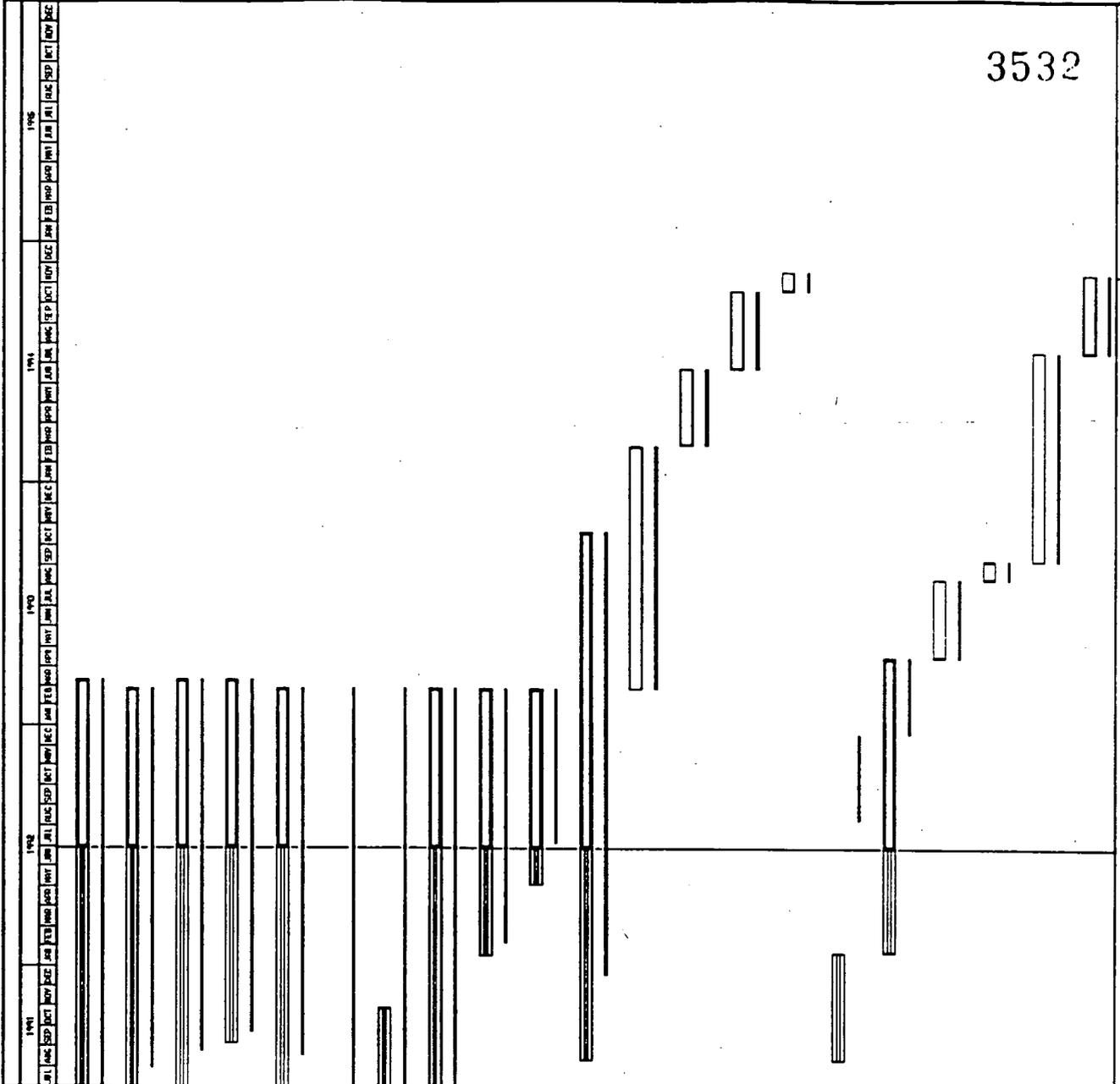
Fire training area soil (OU 5-B soil) is scheduled to be collected at the beginning of July.

OU 5-A soil (soil from maintenance building No. 9) was collected and placed into drums with homogeneity testing and characterization being scheduled for July.

Request for bids for advanced phase soil washing equipment is anticipated in July.

Complete revisions to the Treatability Study Work Plan for submission to U.S. EPA and Ohio EPA.

Incorporate internal review comments and revise the Initial Screening of Alternatives Report for submission to DOE-HQ on July 15, 1992.



OPERABLE UNIT 5 RELATED FIELD ACTIVITIES AS 10CT90 LF 11MAR93
FACILITIES TESTING AS 29MAR91 LF 25FEB93
OU5 FIELD WORK 31 WELL PROGRAM AS 15MAR91 LF 11MAR93
OU5 FIELD WORK - PADDYS RUN SAMPLING AS 6SEP91 LF 11MAR93
OU5 FIELD WORK - 8 RCRA WELLS AS 29MAR91 LF 25FEB93
OU5 FIELD WORK - 6 WELL PROGRAM AS 13JAN91 AF 15MAY91
OU5 FIELD WORK - WATER LEVEL MEASUREMENTS AS 10CT90 AF 28OCT91
OU5 FIELD WORK - MISC. ADDITIONAL WELLS AS 2JAN91 LF 25FEB93
RCRA/CERCLA BACKGROUND SOIL STUDY AS 17JAN92 LF 25FEB93
K-65 SLURRY/C. WELL LINE INVESTIGATION (WP ADD) AS 4MAY92 LF 25FEB93
OU5 TREATABILITY STUDIES AS 12AUG91 LF 20OCT93
OU5 REMEDIAL INVESTIGATION REPORT PREPARATION LS 26FEB93 LF 25FEB94
DOE OU5 RI REVIEW/REVISE/APPROVE LS 28FEB91 LF 23JUN94
EPA OU5 RI REPORT REVIEW/REVISE/APPROVE LS 24JUN91 LF 19OCT94
PRINT AND DIST FINAL OU5 RI REPORT LS 20OCT94 LF 16NOV94
OU5 INITIAL SCREENING OF ALTERNATIVES PREP AS 12AUG91 AF 22JAN92
DOE OU5 ISA REVIEW/REVISE/APPROVE AS 23JAN92 LF 15APR93
EPA OU5 ISA REVIEW/REVISE/APPROVE LS 16APR93 LF 11AUG93
PRINT AND DISTRIBUTE FINAL OU5 ISA REPORT LS 12AUG93 LF 8SEP93
OU5 FEASIBILITY STUDY/PROPOSED PLAN PREP LS 9SEP93 LF 20JUL94
DOE OU5 FS/PP REVIEW/REVISE/APPROVE LS 21JUL94 LF 15NOV94

Prepared by REL/II Corp.

Date: \_\_\_\_\_ Revision: \_\_\_\_\_ Checked: \_\_\_\_\_ Approved: \_\_\_\_\_

Sheet 1 of 2

Date Date: 28JUN92  
Print Date: 6/01/92

RI/FS PROGRAM CURRENT  
FERNALD ENVIRONMENTAL MGMT. PROJECT  
FEMP RI/FS OU5 CONSENT AGMT (LATE)

Project Start: 10CT90  
Project Finish: 31MAY98

Pr: Inverness Systems, Inc. 1994-1991  
Report Form no. of: 18C170

1991												1992												1993												1994												1995												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	

EPA OUS FS/PP REVIEW/REVISE/APPROVE  
 LS 16NOV94 LF 15MAR95

PRINT AND DIST FINAL OUS FS RPT/PP  
 LS 16MAR95 LF 12APR95

OUS PUBLIC COMMENT  
 LS 13APR95 LF 3JUL95

SUBMIT OUS DRAFT ROD TO EPA  
 LF 2AUG95

OUS DRAFT ROD PREPARATION  
 LS 29MAR95 LF 4MAY95

DOE OUS DRAF ROD REVIEW/REVISE/APPROVE  
 LS 4MAY95 LF 2AUG95

Activity Bar/Late Date  
 Critical Activity  
 Program Bar  
 Invert Dates of 18170

Project Start  
 1991 1 1 1991

RI/FS PROGRAM CURRENT  
 FERNALD ENVIRONMENTAL MGMT. PROJECT  
 FEMP RI/FS OUS CONSENT AGMT (LATE)

Sheet 2 of 2

Prepared by: RPL/II Corp.  
 Date: Revision: Checked: Approved:

Date Date: 28JUN92  
 Plot Date: 6JUL92

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**6.0 Engineered Waste Management Facility**

This program will evaluate the ability of the Engineered Waste Management Facility (EWMF) to manage the remedial waste generated by the operable units. The technical approach for the evaluation will be based on a program-specific sampling and analysis plan (SAP) and development of an EWMF Siting Report with comprehensive analysis. The report will perform a detailed analysis of the EWMF as an on-property waste disposal/storage technology option, per OSWER Directive 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA 1988).

**6.1 Sampling and Analysis Plan**

**Scope:**

The U.S. EPA approved the EWMF SAP as an addendum to the RI/FS Work Plan (March 1988), specifying a series of soil sample collection and analytical activities. Geotechnical, geochemical, radiological, and chemical soil samples were collected for analysis from 18 geotechnical borings (each approximately 30 feet deep) and from eight wells (five 1000-series and three 2000-series) installed under this program.

All surface soil samples received full radiological and full HSL analysis while, in general, samples collected at midstratum of the glacial overburden received total uranium and gamma spectral analysis only. The geochemical samples selected for batch sorption tests, x-ray diffraction analysis, and polarized light microscopy will be used to calculate retardation coefficients for an EWMF groundwater fate and transport model. The balance of the collected soil samples received geotechnical testing for preliminary engineering purposes. In addition, an on- and off-property National Environmental Policy Act (NEPA) ecological characterization program was conducted with biota sampling performed on trees at nine on-property locations.

The resultant SAP field and laboratory data will be used to support the evaluation of criteria for a detailed analysis of the EWMF as an on-property waste disposal/storage alternative per the methodology given in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (EPA 1988).

**Status:**

The original field effort has been completed. During implementation, a number of geotechnical borings encountered perched groundwater. In addition, one well set (one 1000-series, one 2000-series) encountered bedrock. Due to these developments, arrangements have been made to install five additional geotechnical borings and to relocate the well pair. The five geotechnical borings were completed in March; the well pair relocation was completed in April.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**6.1 Sampling and Analysis Plan (Continued)**

The off-site ecological walk-over survey, including a preliminary search for running buffalo clover, was conducted April 13 through April 16, 1992.

Chemical and radiological analysis of the EWMF soil samples were completed in May with soil samples for geochemical analysis submitted in early June.

**Issues/Corrective Actions:**

None to report.

**6.2 EWMF General Siting Report**

**Scope:**

The report will establish the feasibility of locating an EWMF at the FEMP by performing a detailed analysis of the EWMF as an on-property waste disposal/storage technology option per OSWER Directive 9355.3-01. The siting report will be divided into specific sections characterizing all pathways and associated risks. The report will be divided into the following sections: Geologic/Hydrogeologic, Geotechnical, Geochemical, Risk Assessment, RI/FS-Environmental Impact Statement, and Applicable or Relevant and Appropriate Requirements (ARARs).

**Status:**

The EWMF ARARs Revision 3 were submitted by the DOE for U.S. EPA and Ohio EPA review on December 3, 1991. Comments were received from the Ohio EPA on January 6, 1992 and the U.S. EPA on January 30, 1992. The ARARs were revised and transmitted to the EPAs on March 18, 1992 as Revision 4. On April 21, 1992, comments were received from Ohio EPA on Revision 4. DOE's responses to the comments will be incorporated into the draft Operable Unit 2 FS/PP/ROD for U.S. EPA submittal.

**Issues/Corrective Actions:**

None to report.

**6.3 Planned Activities for July 1992**

Completion of the geochemical and geotechnical analysis of the EWMF soil samples.

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Prepared by: 681/11 Corp.

Sheet 1 of 1

Date	Revision	Checked	Approved

Date Date: 26 JUN 92  
Plot Date: 6 JUL 92

RI/F S PROGRAM CURRENT  
FERNALD ENVIRONMENTAL MGMT. PROJECT  
FEMP RI/F S EWMF CONSENT AGMT ( LATE )

Project Start: 10/1/90  
Project Finish: 3/14/98

Activity by Milestone Dates  
Critical Activity  
Program Bar  
Target Dates as of 10/1/90

Prismware Systems, Inc. 1988-1991

EWMF SAMPLING AND ANALYSIS PLAN PREP  
AS 18MAR91 LF 18NOV91  
EWMF FIELD INVESTIGATION  
AS 21NOV91 LF 29DEC92  
EWMF MATERIALS SOURCE SURVEY  
AS 17DEC91 LF 6OCT92  
EWMF GENERAL SITING REPORT PREPARATION  
LS 30DEC92 LF 9APR93

1991												1992												1993												1994											
JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JAN	FEB	MAR	APR	MAY	JUN	JAN	FEB	MAR	APR	MAY	JUN	JAN	FEB	MAR	APR	MAY	JUN																		

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**7.0 Site-Wide Characterization Report**

**7.1 Risk Assessment Work Plan Addendum**

**Scope:**

The Risk Assessment Work Plan Addendum provides a detailed scheme for development and completion of a baseline RA for each operable unit, a preliminary site-wide baseline RA, and a remedial action risk evaluation with each operable unit FS.

The Risk Assessment Work Plan Addendum presents the specific RA methods to be followed in the RI/FS RA tasks. It also establishes the scope of RA work and documents the specific approach to be followed for determining whether estimated risks associated with selected remedial alternatives for the entire site are protective of human health and the environment. The addendum provides the methods, models, and parameters for development of the baseline RA for each operable unit, the preliminary baseline RA of the Site-Wide Characterization Report (SWCR), the remedial action risk evaluation, and the comprehensive response action risk evaluation for each operable unit FS.

**Status:**

The (Final) Risk Assessment Work Plan Addendum was delivered to DOE-FN on June 16, 1992 and was transmitted to the U.S. EPA and Ohio EPA on June 19, 1992. The document included responses to comments that were received on May 13, 1992.

The final Addendum fulfills the requirements of the Amended Consent Agreement and presents the detailed methods for performing risk assessment/risk management tasks in the RI/FS to resolve issues raised by U.S. EPA and Ohio EPA.

**Issues/Corrective Actions:**

None to report.

**7.2 SWCR Report Preparation**

**Scope:**

The SWCR is a one-time summary of all FEMP site data available as of December 1, 1991. It contains the preliminary baseline RA, which estimates human health and ecological risk of the FEMP from a site-wide perspective. The SWCR also provides the initial list of the leading remedial alternatives for each operable unit for input into the FS cumulative response action risk evaluation.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**7.2 SWCR Report Preparation (Continued)**

**Status:**

Comments on Part I, Data Summary, and Part III, Feasibility Study Support (Leading Remedial Alternatives) of the SWCR were received from DOE-HQ on June 3. Part II, the Preliminary Baseline Risk Assessment, was submitted for DOE review on June 1, 1992. Review comments were received on June 29.

**SITE-WIDE CHARACTERIZATION REPORT**

**SECONDARY**

SCOPE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides a one-time summary of site characterization data available as of 12/1/91, the Preliminary Baseline Risk Assessment, and a list of the leading remedial alternatives.	08/05/92 C 07/17/92 F	08/18/92 C 11/20/92 F	12/18/92 C 09/15/92 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**Issues/Corrective Actions:**

None to report.

**7.3 Planned Activities for July 1992**

Complete revisions on Parts I, II, III and submit to U.S EPA and Ohio EPA for review on August 5, 1992.

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1991												1992											
JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19					

WORK PLAN REVISIONS

WORK PLAN ADDENDUM PREPARATION  
AS 17JUN91 AF 24JUL91

DOE WORK PLAN REVIEW/REVISE/APPROVE  
AS 30JUL91 AF 24SEP91

EPA WORK PLAN ADD REVIEW/REVISE/APPROVE  
AS 11OCT91 AF 16JUN92

SITETIME CHARACTERIZATION

SITETIME CHARACTERIZATION REPORT PREP  
AS 26JUL91 AF 1JUN92

DOE REVIEW/REVISE/APPROVE SITE CHAR REPORT  
AS 16APR92 EF 17JUL92

EPA REVIEW/REVISE/APPROVE SITE CHAR REPORT  
ES 20JUL92 EF 15SEP92

Prepared by: BSI/PI Corp.	
Date:	Revised:

Sheet 1 of 1  
Data Date: 28JUL92  
Plot Date: 6JUL92

RI/FS PROGRAM CURRENT  
FERNALD ENVIRONMENTAL MGMT. PROJECT  
FEMP RI/FS PSC CONSENT AGMT (LATE)

Activity Bar/Late Dates  
Critical Activity  
Program Bar  
Target Dates as of 18/1/92

Product Start: 10CT90  
Product Finish: 31SEP92

Primesone Systems, Inc. 1991-1992

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**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**8.0 Community Relations**

**8.1 Status**

Work continues on the addenda to the Community Relations Plan (CRP) for the nine removal actions being conducted at the Fernald Environmental Management Project (FEMP). Work Plans for the following removal actions are currently in a 45-day public comment period and are available for review at the Public Environmental Information Center:

- Contaminated Water Beneath FEMP Buildings
- Plant 1 Pad Continuing Release
- Removal of Waste Inventories and Thorium Management
- Active Fly Ash Pile Controls
- Safe Shutdown
- Plant 1 Ore Silos
- Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator
- Collect Uncontrolled Production Area Runoff - Northeast
- Improved Storage of Soil and Debris

After the comment period, a responsiveness summary will be issued which addresses each comment received, and an addendum to the CRP will be prepared for each removal action.

On June 16, DOE-FN received comments from the U.S. EPA on the revised Community Relations Plan -- Remedial Investigation/Feasibility Study and Removal Actions -- Volume III of the Work Plan. The comments were quite extensive in that they not only addressed the updates that were submitted in a redlined format for easier understanding of this revision, but many of the comments were associated with portions from the original CRP (8-10-90). Nevertheless, the Work Plan is being revised and edited to address all comments.

On June 8, 1992 the DOE held a community workshop about the new Public Participation Plan initiative of the FEMP. The objective was to involve the community in reviewing documents necessary to the cleanup of the FEMP. More workshops will be held to review and get public input for the following DOE documents:

- Activity Data Sheets
- Roadmaps
- Priority Scoring
- Five-Year Plan
- Site-Specific Plan

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**8.0 Community Relations (Continued)**

Preparation has begun on the RI/FS exhibit for the upcoming July 21 Community Meeting. A dry run has been scheduled for July 14.

**8.2 Issues/Corrective Actions:**

None to report.

**8.3 Planned Activities for July 1992**

The public comment period for the nine removal actions being conducted at the FEMP will end July 11. A draft addendum to the CRP will be written for each removal action incorporating all comments received from the public.

The CRP will be revised to incorporate U.S. and Ohio EPA comments.

A Community Meeting to inform the public on the status of cleanup at the FEMP will be held at 7:00 p.m. on July 21 at the Plantation in Harrison, Ohio.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

**PERIOD ENDING JUNE 30, 1992**

**ENCLOSURE A**

**WASTEWATER FLOWS AND RADIONUCLIDE  
CONCENTRATIONS UNDER CA SECTION XXIII.B**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**Introduction**

The accompanying Effluent Radiation Reports provide, in accordance with the requirements of Section XXIII.B of the Consent Agreement As Amended under CERCLA Sections 120 and 106 (a), data on the daily wastewater flows, radionuclide concentrations, and loadings released to the Great Miami River and an estimate of runoff and radionuclide concentrations to Paddy's Run during June 1992.

**Summary - June 1992**

The total quantity of uranium discharged from the FEMP to the Great Miami River via Manhole 175 (Outfall 11000004001) was 21.34 kilograms. The average uranium concentration for the previous 12 months was 0.56 mg/l. This is 62.9 percent of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

There was no discharge from the Stormwater Retention Basin (Outfall 11000004002) to Paddy's Run via the Storm Sewer Outfall Ditch in June 1992. Based on 2.83 inches of rainfall in June 1992, the total quantity of uranium discharged to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 12.74 kilograms.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**Wastewater Flows and Radionuclide Concentrations**

Facility: Fernald Environmental Management Project  
U.S. Department of Energy  
7400 Willey Road, P.O. Box 398705  
Cincinnati, Ohio 45239-8705

Location: 11000004001  
001 Total Discharge  
Manhole 175 (Effluent to the Great Miami River)

Month: June 1992

Day	Flow (MGD)	Total Alpha (pCi/l)	Total Beta (pCi/l)	Total U (mg/l)	Total U (kgs)	Calculated Total U-238 (pCi/l) (1)
1	0.370	302	194	0.54	0.76	182
2	0.345	432	185	0.48	0.63	162
3	0.382	306	180	0.52	0.75	176
4	0.532	383	131	0.52	1.05	176
5	0.424	369	126	0.44	0.71	149
6	0.400	311	135	0.48	0.73	162
7	0.531	369	162	0.58	1.17	196
8	0.409	297	563	0.56	0.87	189
9	0.422	315	149	0.50	0.80	169
10	0.705	257	63	0.32	0.85	108
11	0.938	230	104	0.38	1.35	128
12	0.493	248	140	0.48	0.90	162
13	0.315	329	203	0.60	0.71	203
14	0.259	405	315	0.74	0.73	250
15	0.293	212	180	0.44	0.49	149
16	0.336	297	171	0.36	0.46	122
17	0.343	225	162	0.34	0.44	115
18	0.484	257	126	0.38	0.70	128
19	0.411	252	131	0.54	0.84	182
20	0.917	135	86	0.26	0.90	88
21	0.684	167	149	0.30	0.78	101
22	0.331	405	122	0.44	0.55	149
23	0.342	248	149	0.36	0.47	122
24	0.339	216	108	0.28	0.36	95
25	0.279	239	122	0.44	0.46	149
26	0.352	225	131	0.46	0.61	155
27	0.270	297	158	0.64	0.65	216
28	0.356	212	126	0.46	0.62	155
29	0.447	221	167	0.34	0.57	115
30	<u>0.407</u>	149	149	0.30	<u>0.46</u>	101
TOTAL	13.116				21.34	

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**Wastewater Flows and Radionuclide Concentrations**

Facility: Fernald Environmental Management Project

Location: 001 Total Discharge

Month June 1992

	Flow (MGD)	Total Alpha (pCi/l)(2)	Total Beta (pCi/l)(2)	Total U (mg/l)(2)	Total U (kgs)	Calculated Total U-238 (pCi/l)(1)(2)
Avg.	0.437	267	153	0.43	0.71	145
Max.	0.938	432	563	0.74	1.35	250
Min.	0.259	135	63	0.26	0.36	88

The average uranium concentration for the previous twelve months was 0.56 mg/l. This is 62.9 percent of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

Comments: (1) The activity of this discharge has been and will continue to be reported as Uranium-238 (pCi/l) in accordance with the Ohio EPA format for reporting uranium. Since this does not account for the activity of the other uranium isotopes in the effluent, the total uranium data is also presented. The calculated total U-238 is based on a conversion factor of 337.84 pCi U-238/mg Total U applied to measure value of total uranium.

(2) Average values presented are flow-weighted.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**Wastewater Flows and Radionuclide Concentrations**

**Facility:** Fernald Environmental Management Project  
U.S. Department of Energy  
7400 Willey Road, P.O. Box 398705  
Cincinnati, Ohio 45239-8705

**Location:** 11000004002  
002 Discharge (Overflow) to Storm Sewer Outfall Ditch  
Stormwater Retention Basin Spillway (Effluent to Paddy's Run)

**Month:** June 1992

There was no discharge to Paddy's Run from the Stormwater Retention Basin..

Based on 2.83 inches of rainfall for the month, the uranium discharge to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 12.74 kgs.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE  
AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

**PERIOD ENDING JUNE 30, 1992**

**ENCLOSURE B**

**FFCA: INITIAL REMEDIAL MEASURES**

**AND OTHER OPEN ACTIONS**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

INTRODUCTION

Enclosure B describes actions undertaken at the FEMP during the period June 1 through June 30, 1992 that are not covered by the reporting requirements of the Consent Agreement As Amended under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 120 and 106(a).

**WORK ASSIGNMENTS AND PROGRESS**

Descriptions of ongoing work progress are presented in the following sections of this report. The status of ongoing work in support of the Federal Facility Compliance Agreement (FFCA) is summarized in Table 1 of Enclosure B. Completed work previously reported upon has been eliminated for the sake of brevity. In this portion of the report and in Table 1, descriptions of actions are presented in a format consistent with that of the FFCA.

**COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND  
LIABILITY ACT (CERCLA)**

1. Initial Remedial Measures

*Section C*

K-65 Silo Project - Status information on the K-65 Silo project normally reported in this section is being provided under Operable Unit 4: Silos 1-4.

2. Remedial Investigation/Feasibility Study (RI/FS)

Status information on the Remedial Investigation/Feasibility Study (RI/FS) normally reported in this section is being provided separately in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND  
LIABILITY ACT (CERCLA)**

3. Reports and Record Keeping

*Section B*

The RI/FS Monthly Technical Progress Report for May 1992 was transmitted to the U.S. EPA on June 19, 1992 as an integral part of the Consolidated Consent Agreement/Federal Facility Compliance Agreement (CA/FFCA) Monthly Progress Report in accordance with the requirements of Section X of the Consent Agreement As Amended.

**CLEAN AIR ACT (CAA)**

*Section E*

The Quarterly Particulate Emissions Report will now be incorporated into the Annual NESHAP Compliance Report.

**RADIATION DISCHARGE INFORMATION**

*Section A*

The twenty-first Quarterly Liquid Discharge Report for the period October through December 1991 was submitted to the U.S. EPA on February 20, 1992. This information will now be submitted on an annual basis.

**REPORTING REQUIREMENTS**

*Section B*

The Federal Facility Compliance Agreement Monthly Progress Report for May 31, 1992, was transmitted to the U.S. EPA on June 19, 1992 as Enclosure B of the Consolidated Consent Agreement/Federal Facility Compliance Agreement (CA/FFCA) Monthly Progress Report.

TABLE 1

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STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON  
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS

JUNE 30, 1992

<u>ACTION</u>	<u>DESCRIPTION</u>	<u>COMPLETION TIME AFTER FFCA SIGNED</u>	<u>FY1992 STATUS</u>
CERCLA			
1.	INITIAL REMEDIAL MEASURES		
1.C	Implement radon control plan approved by the U.S. EPA.	-----	No longer applicable. Progress on actions to address radon emissions from the K-65 Silos are being reported separately under Section IX-Removal Actions of the Consent Agreement/FFCA Monthly Progress Report.
2.	REMEDIAL INVESTIGATION/FEASIBILITY STUDY		No action required.
2.A	RI/FS work is to be conducted in accordance with the U.S. EPA guidelines.	N/A	
2.B	--No Action Required--	-----	Status information on the RI/FS is being reported in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
2.E	Amend and submit revised RI/FS Work Plan to U.S. EPA if deficiencies are found.		Status information on the RI/FS is being reported in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
2.F	Implement tasks described in the approved RI/FS Work Plan		Status information on the RI/FS is being reported in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA sections 120 and 106(a).
3.	REPORTS AND RECORD KEEPING		
3.B	Submit monthly RI/FS progress reports.	monthly	The RI/FS Monthly Progress Report for May 1992 was transmitted to the U.S. EPA on June 19, 1992 (DOE-1955-92).
CLEAN AIR ACT			
B.4	Prepare annual progress report installation and replacement of emission control devices.	yearly	The Fourth Annual Progress Report on the installation and replacement of emission control devices was transmitted to the U.S. EPA on January 28, 1992 (DOE-982-92).

**STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON  
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS**

**JUNE 30, 1992**

C.	Provide annual reports to the U.S. EPA per 40 CFR 61.94(c).	yearly	The Annual NESHAP Compliance Report for CY1990 was transmitted to the U.S. EPA on June 25, 1992 (DOE-1912-92).
D.1	Provide U.S. EPA with yearly stack-testing schedule.	yearly	The 1989 stack testing schedule was transmitted to the U.S. EPA on June 16, 1989. A letter (DOE-1615-89) was transmitted to the U.S. EPA on September 15, 1989, indicating that, due to the uncertainty concerning resumption of production at the FEMP, the 1989 FFCA Stack Testing Program was being deferred. In August 1991, the DOE confirmed that no further production would take place at the facility, and renamed the facility the FEMP. Some stack operations are expected when waste processing operations are resumed. The U.S. EPA will be provided with notification of future stack testing dates when operating schedules are formulated.
D.2	Provide U.S. EPA with stack-test results for stacks tested that year.	45 days	Because the FEMP has been out of production since mid-1989, there was no opportunity to perform stack testing. The DOE, in August 1991, confirmed that no future production will take place at the FEMP. Some stack operations are expected when waste processing operations are resumed. Stack test results will be provided following the completion of testing on stacks which are returned to operation.
E.1	Maintain records of monthly particulate matter emissions.	-----	Ongoing.
E.2	Provide quarterly reports to U.S. EPA on these emissions.	-----	The Quarterly Particulate Emissions Report will now be incorporated into the Annual NESHAP Compliance Report.
<b>RCRA</b>			
A.1	Conduct a hazardous waste determination on all waste streams.	30 days	Pursuant to the proposed Amended Consent Decree, a RCRA waste evaluation will be conducted on all site materials by 10/92.

**STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON  
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS**

**JUNE 30, 1992**

A.2	Commence a hazardous waste analysis program for materials in the landfill and going to the incinerator.	30 days	Complete. Operation of these units was discontinued and data on the waste which had gone to them was provided in a 30-day FFCA deliverable on August 17, 1986. However, further review of both the waste streams and the potential of the units to be hazardous waste management units are being evaluated as actions required by the proposed Amended Consent Decree. Final results are due October 30, 1992.
A.5	Update the facility closure plan to reflect the year the facility expects to begin closure.	30 days	The Facility closure date is dependent upon closure schedules for individual TSD units as presented most recently in Section I of the RCRA Part B Permit Application transmitted to the Ohio EPA and the U.S. EPA on October 30, 1991 (DOE-211-92). Facility closure will be completed on a date the last TSD unit is closed.

**RADIATION DISCHARGE INFORMATION**

A.3	Report to U.S. EPA, Ohio EPA and Ohio Department of Health the results of the continuous liquid discharge samples.	yearly	The twenty-first Quarterly Discharge Report for the period October through December 1991 was transmitted to the U.S. EPA on February 20, 1992 (DOE-941-92). This information will now be reported on an annual basis.
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**REPORTING REQUIREMENTS**

B.	Issue monthly progress report of actions taken to ensure compliance with FFCA requirements.	monthly	May's FFCA Monthly Progress Report was transmitted to the U.S. EPA on June 19, 1992 (DOE-1955-92).
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**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

**PERIOD ENDING JUNE 30, 1992**

**ENCLOSURE C**

**FEDERAL FACILITY AGREEMENT:  
CONTROL AND ABATEMENT OF RADON-222 EMISSIONS**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**Introduction**

The Federal Facility Agreement (FFA) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA), signed November 19, 1991, requires that a monthly report be submitted to the U.S. EPA regarding all steps undertaken in the preceding month to implement Part V of the agreement and that all data generated as a result of those actions be submitted.

Enclosure C fulfills those requirements by describing steps taken at the FEMP during the period June 1 through June 30, 1992, to implement Part V, Radon-222 Control and Abatement Plan, paragraphs 19-33 of the FFA.

After four months of data collection for the applicable parameters, preparation is now underway to evaluate the data for use in the Transport Release Models.

**Work Assignments and Progress**

In this section of Enclosure C, action descriptions and work progress are presented in a format consistent with that of the FFA. Immediately following this section are the K-65 Silos Report and the Selected Radon Data Report. Reporting this data is also a requirement included in the U.S. EPA approved Silos 1 and 2 Removal Action Work Plan (Removal Action No. 4).

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

<u>FFA Part, Paragraph(s)</u>	<u>Description of Commitment</u>	<u>FFA Due Date</u>	<u>Status of Commitment</u>
Part V, 19 & 21	Implement the K-65 Silos 1 and 2 Removal Action in accordance with the approved Silos 1 and 2 Removal Action Work Plan.	12/1/91	Completed. Installation of the bentonite completed 11/28/91.
Part V, 20	Reduce radon-222 to a level As-Low-As Reasonably Achievable (ALARA) with the goal as specified in the Silos 1 and 2 Removal Action Work Plan.	5/22/92	Completed. The Bentonite Effectiveness Environmental Monitoring Report was transmitted to the U.S. EPA on 5/22/92.
Part V, 22	Submit proposed methodology for estimating radon-222 concentration reductions resulting from completion of the Silos 1 and 2 Removal Action.	Within 60 days of completing removal action; 1/27/92.	Completed. The Bentonite Effectiveness Environmental Monitoring Plan was resubmitted to the U.S. EPA for comment and approval on 3/13/92. EPA approval was received on 4/24/92.
Part V, 23	Evaluate performance of the removal action and determine whether or not additional actions are needed prior to final remediation.	None specified.	Methodology for estimating radon-222 concentration reduction submitted to U.S. EPA per paragraph 20 of Part V. The first Bentonite Effectiveness Environmental Monitoring Report was issued to the U.S. EPA on 5/22/92.
Part V, 24, 25, and 33	Demonstrate compliance with NESHAP Subpart Q at the completion of final remediation using a methodology approved by the U.S. EPA. Applicable to: Silos 1, 2, and 3; Waste Pits 1, 2, 3, 4, and 5 and the Clearwell; and any newly discovered radon-222 emission sources.	None specified.	No information to report for June 1992.

<u>FFA Part, Paragraph(s)</u>	<u>Description of Commitment</u>	<u>FFA Due Date</u>	<u>Status of Commitment</u>
Part V, 26	Directly measure radon-222 flux from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell in the RI/FS under the CERCLA Consent Agreement.	None specified.	No information to report for June 1992.
Part V, 26	Include direct measurement data from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell in the RI/FS under the CERCLA Consent Agreement.	None specified.	No information to report for June 1992.
Part V, 27	Estimate Radon-222 emissions from Silo 3 based upon characterization data; include the estimated radon-222 emission data from Silo 3 in the RI/FS that includes Silo 3 under the CERCLA Consent Agreement.	None specified.	No information to report for June 1992.
Part V, 28	Submit documentation or estimates of current radon-222 emissions from existing but newly discovered sources that contain Radium-226 in sufficient concentrations to emit radon-222 in excess of NESHAP Subpart Q prior to final remediation.	Within 30 days of discovery.	No new sources identified.
Part V, 30	Submit methodology for direct measurement or other appropriate means of characterization of the relevant emissions pursuant to paragraph 29 of the FFA.	Within 45 days of the U.S. EPA response pursuant to paragraph 29.	None required.

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<u>FFA Part, Paragraph(s)</u>	<u>Description of Commitment</u>	<u>FFA Due Date</u>	<u>Status of Commitment</u>
Part V, 31	Submit results of measurements pursuant to paragraph 30.	Within 30 days of U.S. EPA approval of characterization method.	None required.
Part VI, 31	Submit monthly report on steps undertaken to implement Part V of the FFA in the preceding month.	20th day of succeeding month.	The sixth progress report being submitted herewith as an integral part of the CERCLA Consent Agreement Monthly Progress Report.

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**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

Period Ending June 30, 1992

**Data Reporting Requirements: RA No. 4: Silos 1 and 2**

As defined in the Silos 1 and 2 Removal Action Work Plan and the Federal Facility Agreement, data associated with monitoring the effectiveness of the bentonite installation are included in the following tables: the K-65 Silos Report and the Selected Radon Data Report.

The K-65 Silos Report includes or will include data on the following parameters:

- Ambient temperature and pressure near the silos.
- Silos 1 and 2 headspace temperature.
- Silos 1 and 2 differential pressure.
- Silos 1 and 2 radon headspace concentration.
- Silos 1 and 2 headspace humidity

The silo radon headspace data submitted has been collected manually since the completion of the bentonite installation. An automated data logging system is currently being calibrated. After calibration and final system check-out of the data logging system is completed, the data for Silos 1 and 2 and the perimeter pylons will be automatically recorded.

The Selected Radon Data Report includes or will include radon data from the following locations:

- Air monitoring station number 5 (AMS-5)
- Air monitoring station number 6 (AMS-6)
- Pilot Plant
- Background data
- K-65 Monitoring Data (K-65 NW, K-65 SW, K-65 NE, K-65 SE). Figure C-6, immediately following, identifies the sampling locations.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY  
PROGRESS REPORT**

**Period Ending June 30, 1992**

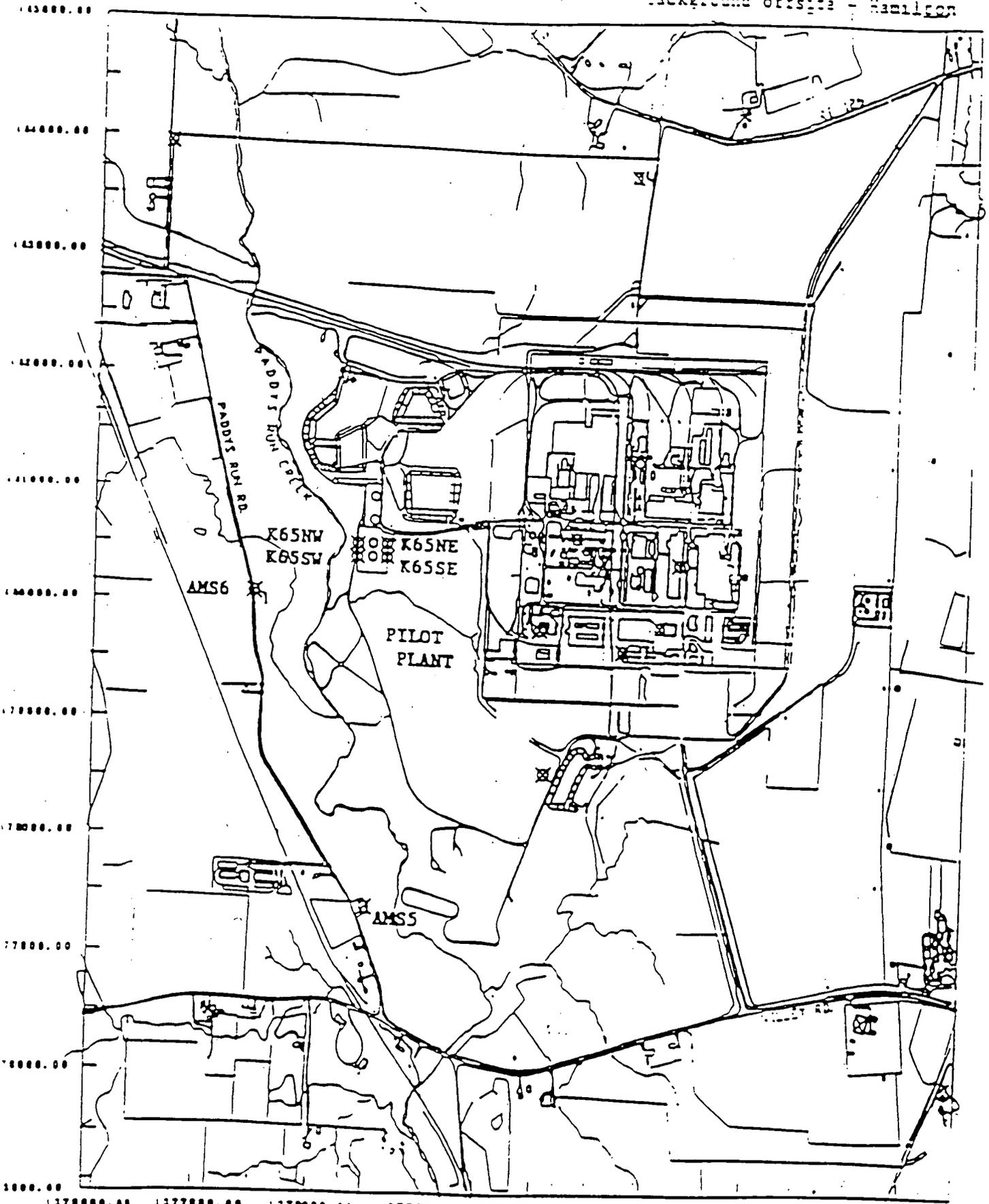
**Issues/Corrective Actions:**

DOE-FN is evaluating the appropriateness of the model and techniques of measuring the radon. A meeting will be scheduled with the U.S. EPA to discuss the outcome of the evaluation and proposed revisions to the method of measuring the effectiveness of the bentonite.

# REAL-TIME RADON MONITORING LOCATIONS

3532

Background office - Hamilton



EAST COORDINATE

CONSOLIDATE CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/  
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

3532

FACILITY: Fernald Environmental Management Project  
U.S. Department of Energy  
7400 Willey Road, P.O. Box 398704  
Cincinnati, Ohio 45239 Hamilton

K-65 SILO REPORT

LOCATION: Silo # 1

DATE: June 1992

Day	Ambient Temp Deg. F	Ambient Pres In. Hg.	Temperature Head Space Deg. F	Inter. Hum. %	Diff. Pres In. HG	Head Space Radon (pCi/l)
1	61.3	29.52	53.8	98	-0.03	122,500
2	64.5	29.45	54.4	100	-0.02	*
3	65.5	29.34	54.9	100	-0.03	53,000
4	64.2	29.13	55.3	100	-0.03	*
5	64.8	29.12	55.5	100	-0.03	*
6	69.9	29.27	55.8	100	-0.01	*
7	67.4	29.34	56.4	100	-0.45	*
8	69.6	29.47	56.7	100	-0.01	206,400
9	69.3	29.42	57.2	99	-0.01	178,700
10	65.8	29.43	57.5	99	-0.02	170,000
11	67.6	29.45	57.6	99	-0.02	193,100
12	70.8	29.44	57.7	99	0.00	155,800
13	69.8	29.37	58.2	99	-0.01	*
14	70.7	29.34	58.5	99	0.00	*
15	69.9	29.41	58.6	99	-0.02	*
16	75.7	29.49	58.8	99	0.01	198,700
17	78.4	29.40	59.6	99	0.01	*
18	72.6	29.30	60.1	99	-0.22	*
19	68.9	29.27	60.1	99	-0.02	*
20	57.1	29.32	59.7	100	-0.06	*
21	55.3	29.45	58.8	100	-0.06	*
22	56.9	29.49	58.4	99	-0.05	213,100
23	62.3	29.26	58.6	100	-0.04	30,000
24	68.3	29.14	58.8	99	-0.02	*
25	70.0	29.21	59.2	99	-0.01	184,500
26	70.4	29.26	59.8	99	-0.02	159,500
27	64.2	29.38	59.9	99	-0.03	*
28	66.9	29.40	60.0	99	-0.01	*
29	69.5	29.35	60.4	98	-0.01	267,800
30	74.3	29.32	60.7	98	0.00	*
ARITHMETIC						
MEAN	67.4	29.35	58.0	99.2	-0.04	164,085
MAX. AVG.	78.4	29.52	60.7	100.0	0.01	267,800
MIN. AVG.	55.3	29.12	53.8	98.0	-0.45	30,000
MEDIAN	68.9	29.35	58.6	99.0	-0.02	181,600

Note: \* - Data collected periodically.

Maximum and minimum averages are based on daily averages.

CONSOLIDATE CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT  
 FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

FACILITY: Fernald Environmental Management Project  
 U.S. Department of Energy  
 7400 Willey Road, P.O. Box 398704  
 Cincinnati, Ohio 45239 Hamilton

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K-65 SILO REPORT

LOCATION: Silo # 2

DATE: June 1992

Day	Ambient Temp Deg. F	Ambient Pres In. Hg.	Temperature Head Space Deg. F	Inter. Hum. %	Diff. Head Space Pres In. HG	Radon (pCi/l)
1	61.3	29.52	53.6	100	-0.10	12,300
2	64.5	29.45	54.2	100	-0.11	*
3	65.5	29.34	54.7	100	-0.11	296,900
4	64.2	29.13	55.1	100	-0.11	*
5	64.8	29.12	55.2	100	-0.11	*
6	69.9	29.27	55.6	99	-0.11	*
7	67.4	29.34	56.2	99	-0.52	*
8	69.6	29.47	56.5	99	-0.11	267,300
9	69.3	29.42	56.9	99	-0.12	316,900
10	65.8	29.43	57.2	99	-0.11	93,000
11	67.6	29.45	57.3	100	-0.11	175,800
12	70.8	29.44	57.4	99	-0.11	238,200
13	69.8	29.37	57.9	99	-0.11	*
14	70.7	29.34	58.1	99	-0.11	*
15	69.9	29.41	58.3	99	-0.11	*
16	75.7	29.49	58.5	99	-0.12	418,800
17	78.4	29.40	59.2	98	-0.14	*
18	72.6	29.30	59.8	98	-0.25	*
19	68.9	29.27	59.7	99	-0.13	*
20	57.1	29.32	59.3	100	-0.12	*
21	55.3	29.45	58.4	100	-0.12	*
22	56.9	29.49	58.0	100	-0.11	173,700
23	62.3	29.26	58.2	100	-0.12	111,400
24	68.3	29.14	58.3	99	-0.12	*
25	70.0	29.21	58.8	99	-0.12	107,800
26	70.4	29.26	59.4	99	-0.12	197,500
27	64.2	29.38	59.5	99	-0.12	*
28	66.9	29.40	59.5	99	-0.12	*
29	69.5	29.35	59.8	99	-0.12	264,500
30	74.3	29.32	60.2	98	-0.13	*

ARITHMETIC

MEAN	67.4	29.35	57.7	99.2	-0.13	205,700
MAX. AVG.	78.4	29.52	60.2	100.0	-0.10	418,800
MIN. AVG.	55.3	29.12	53.6	98.0	-0.52	12,300
MEDIAN	68.9	29.35	58.2	99.0	-0.12	197,500

Note: \* - Data collected periodically

Maximum and minimum averages are based on daily averages.

## SELECTED RADON DATA REPORT

FACILITY: Fernald Environmental Management Report  
 U.S. Department of Energy  
 7400 Willey Road, P.O. Box 398704  
 Cincinnati, Ohio 45239 Hamilton

LOCATION: Selected Sampling Locations

DATE: June 1992

Day	AMS 5 (pCi/L) =====	AMS 6 (pCi/L) =====	PLANT (pCi/L) =====	BKGRD (pCi/L) =====
1	0.7	0.7	*	0.7
2	1.0	1.0	0.6	0.7
3	1.0	1.0	1.1	0.8
4	0.6	0.5	0.6	0.5
5	0.7	0.8	0.8	0.7
6	0.7	0.7	0.8	0.6
7	0.8	0.8	0.9	0.6
8	0.4	0.5	0.6	0.4
9	0.4	0.5	0.5	0.4
10	0.7	0.6	0.6	0.4
11	0.9	0.7	0.7	0.5
12	1.1	1.0	1.0	0.7
13	1.1	1.1	1.1	0.8
14	1.0	0.9	0.8	0.6
15	0.7	1.1	0.9	0.8
16	0.8	0.7	0.8	0.7
17	1.1	1.0	1.0	0.6
18	0.4	0.5	0.6	0.4
19	0.5	0.6	0.7	0.4
20	0.5	0.6	0.6	0.4
21	0.5	0.5	0.7	0.4
22	0.9	0.8	0.9	0.7
23	0.7	0.8	0.8	0.6
24	0.6	0.6	0.7	0.5
25	1.1	1.0	1.1	0.8
26	1.1	1.0	1.1	0.8
27	0.8	0.8	0.8	0.6
28	1.2	1.1	1.0	0.8
29	1.3	1.3	1.1	0.9
30	1.3	1.3	1.1	0.9
AVERAGE	0.8	0.8	0.8	0.6
MAXIMUM	3.3	3.3	2.3	1.8
MINIMUM	0.1	0.2	0.2	0.1
MEDIAN	0.8	0.8	0.8	0.6

\* Data not available due to instru. failure

Maximum and minimum values are based on hourly readings  
 Daily values are based on twenty-four hourly readings

## SELECTED RADON DATA REPORT

FACILITY: Fernald Environmental Management Report  
 U.S. Department of Energy  
 7400 Willey Road, P.O. Box 398704  
 Cincinnati, Ohio 45239 Hamilton

LOCATION: Selected Sampling Locations

DATE: June, 1992

Day	NW (pCi/L)	SW (pCi/L)	NE (pCi/L)	SE (pCi/L)
1	(0.4)	1.3	1.0	1.0
2	(0.6)	1.5	0.4	0.6
3	(0.7)	1.2	0.8	1.6
4	(0.3)	1.1	0.3	0.5
5	(0.4)	1.2	1.2	0.9
6	(0.3)	1.2	2.2	0.9
7	(0.4)	0.7	2.1	0.8
8	(0.1)	0.7	1.6	0.3
9	(0.1)	0.8	1.6	0.3
10	(0.3)	1.0	1.0	0.6
11	(0.4)	1.2	1.3	0.7
12	(0.6)	1.4	1.1	1.1
13	(0.7)	1.5	1.1	1.1
14	(0.6)	1.3	0.5	0.8
15	(0.7)	1.6	0.4	1.0
16	(0.5)	1.2	0.6	0.7
17	(0.6)	1.5	2.1	1.1
18	(0.1)	0.7	0.7	0.4
19	(0.2)	1.1	0.3	0.8
20	(0.3)	1.3	0.5	0.5
21	(0.4)	0.9	0.4	0.6
22	1.1	1.2	0.9	0.9
23	1.2	1.4	1.6	1.1
24	1.1	1.3	1.3	0.8
25	1.4	1.5	1.3	1.4
26	2.3	1.4	1.6	1.3
27	1.1	1.2	1.1	0.9
28	1.4	1.5	1.1	1.4
29	1.5	1.7	1.6	1.6
30	1.6	1.8	1.0	1.7
AVERAGE	0.7	1.2	1.1	0.9
MAXIMUM	2.7	6.0	5.2	6.0
MINIMUM	0.1	0.4	0.1	0.1
MEDIAN	0.6	1.3	1.1	0.9

( ) – alternate instrument (RGM) was used instead of Pylon AB-5  
 due to instrument failure

maximum and minimum values are based on hourly readings  
 daily values are based on twenty-four hourly readings

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>1602 04.19</u>	PROJECT NAME: <u>4- RCRA Well Program</u>	
BORING NUMBER: <u>3720 / 155</u>	COORDINATES:	DATE: <u>11/1/92</u>
ELEVATION: <u>530 ft</u>	GWL: Depth <u>60.94 ft</u> Date/Time <u>04/12/92 - 1530</u>	DATE STARTED: <u>11/1/92</u>
ENGINEER/GEOLOGIST: <u>D. O'Brien</u>	Depth	Date/Time
DRILLING METHODS: <u>Cable Tool</u>	PAGE <u>1</u> OF <u>17</u>	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 10 IN	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
1502	155	4	100	V. Stiff. 2.54 (1 1/4) Light olive brown, silty clay low plasticity, slightly moist.	CI	2.5	HNU = 0 ppm BS = 40 cpm
	NA	12	0	No Recovery	NA	NA	
	NA	16	0	No Recovery	NA	NA	
1525	155	6	100	V. Stiff. 2.54 (1 1/4) Light olive brown, silty clay low plasticity, slightly moist.	CI	2.75	HNU = 0 ppm BS = 60 cpm
	NA	7	0	No Recovery	NA	NA	
	NA	12	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone

Driller: John Bartle John Kordine Craig Coulter 11/1/92

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

Background Readings  
 HNU = 0 ppm  
 BS = 60-80 cpm

Samples collected per ASTM Standard Penetration Test  
 Colors identified by using Munsell Color Chart

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 04.19	PROJECT NAME: 4- RCRA Well Program		
BORING NUMBER: 37221	COORDINATES:	DATE: 6/1/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D.O'Brien	Depth	Date/Time	DATE COMPLETED: 6/22/92
DRILLING METHODS: Cable Tool	PAGE 2		OF 17:

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 10 IN	RECOVERY (%)	DESCRIPTION	UCS SYMBOL	MEASURED CONSISTENCY (%F)	REMARKS
4	1530 6034 61192	4 7 25	0	Hard. 2.5y (5/4) Light olive brown, silty clay low plasticity, slightly moist	CI	4.5	HNu = 0 ppm BS = 40 cpm
	NA	14	0	No Recovery	NA	NA	
	NA	25	0	No Recovery	NA	NA	
5	1543 6035 61192	25 10 10	0	Hard. 2.5y (6/3) Light yellowish brown, silty clay low plasticity, dry	CI	4.5	HNu = 0 ppm BS = 40 cpm
	1546 6036 61192	10 10 10	0	SAA	CI	4.5	
	NA	NA	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone

Driller: JOE BARTLE John Vardina 6/1/92  
CRAIG COULTER

SAA - SAME AS ABOVE  
NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 1602 04. 19	PROJECT NAME: 4- RCRA Wall Program		
BORING NUMBER: 3221	COORDINATES:	DATE: 11/1/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 11/1/92
ENGINEER/GEOLOGIST: D.O'Brien	Depth	Date/Time	DATE COMPLETED: 11/22/92
DRILLING METHODS: Cable Tool	PAGE 3		OF 17

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (PSF)	REMARKS
6.05	16057	17	6	V. Stiff. 2.5 (5/16) Light olive brown mottled w/ gray silty clay, low plasticity, slightly moist.	cl	3.5	HNu = 0 ppm Bs = 80cpm
7.15	16058	35	6	SAA	cl	3.5	
7.00	NA	50	0	No Recovery	NA	NA	
8.15	16059	6	6	V. Stiff. 2.5 (5/16) Light olive brown mottled w/ a little gray silty clay, low plasticity, slightly moist.	cl	2.75	HNu = 0 ppm Bs = 80cpm
8.00	16060	13	6	SAA	cl	3.0	
8.00	NA	17	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 42 Cyclone  
 Driller: Jay BATTLE John Vardine DSD 01/192  
CRAIG COULTER

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 1602 04.19	PROJECT NAME: 4- RCRA Well Program		
BORING NUMBER: 3825/1645	COORDINATES:	DATE: 6/1/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D.O'Brien	Depth	Date/Time	DATE COMPLETED: 11/22/92
DRILLING METHODS: Cable Tool	PAGE 4		OF 17

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0m	RECOVERY mm	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
10	1625 W5061	23	6	V. Stiff. 10YR (5/6) yellowish brown silty clay w/ gravel iron deposits, low plasticity, slightly moist	CI	2.5	H <sub>Nu</sub> = 0ppm R <sub>S</sub> = 40cpm
	NA	30	0	No Recovery	NA	NA	
	NA	17	0	No Recovery	NA	NA	
11	1645 W5062	9	6	V. Stiff. 2.5/ (4/2) Light brownish gray silty clay w/ gravel low plasticity slightly moist	CI	2.5	H <sub>Nu</sub> = 0ppm R <sub>S</sub> = 80cpm
	1645 W5063	14	6	SAA	CI	2.0	
	1645 W5064	23	4	SAA	CI	3.0	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone

Onler: JOE BARILE John Iordine  
CRAIG COULTER

SAA - SAME AS ABOVE  
NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 1602 04 19	PROJECT NAME: 4- RCRA Well Program	
BORING NUMBER: 3828 / 16115	COORDINATES:	DATE: 6/1/92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 6/22/92
DRILLING METHODS: Cable Tool	PAGE: 5	OF 17:

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0 IN	RECOVERY %	DESCRIPTION	UNCS SYMBOL	MEASURED CONSISTENCY (%T)	REMARKS
13.50	165065	5	6	V. Stiff. 2.5y (10/2) Light brownish gray silty clay w/ gravel low plasticity moist	CI	2.5	HMU = 0 ppm RS = 60 cpm
13.50	165066	10	6	V. Stiff. 2.5 (10/1) Gray silty clay w/ gravel low plasticity slightly moist	CI	3.5	
13	NA	15	0	No Recovery	NA	NA	
14.00	165067	5	5	V. Stiff. 2.5y (10/1) Gray mottled w/ light brown silty clay w/ gravel. Low plastic slightly moist.	CI	3.5	HMU = 0 ppm RS = 80 cpm
14	NA	8	0	No Recovery	NA	NA	
	NA	13	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone

Driller: JOHN BARTLE John Verdine  
CRAIG COULTER

SAA - SAME AS ABOVE  
NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

3532

PROJECT NUMBER: 602 04.19		PROJECT NAME: 4- RCRA Well Program	
BORING NUMBER: 3321		COORDINATES:	DATE: 6/2/92
ELEVATION:		GWL: Depth      Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D. O'Brien		Depth      Date/Time	DATE COMPLETED: 6/22/92
DRILLING METHODS: Cable Tool			PAGE 10 OF 17

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER UNIT	RECOVERY %	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY TEST	REMARKS
	0500 U5008	8	6	Med. stiff 2.5Y(5.1) Gray silty clay w/ gravel med. plasticity slightly moist	cl	.5	H <sub>2</sub> O = 0 ppm B <sub>x</sub> = 20 cpm
	11.25 0500			SAA			
	U5009	14	6		cl	.5	
16	11.62 0500			SAA			
	U5070	14	5		cl	.75	
	U2182						
	NA	6	0	No Recovery	NA	NA	H <sub>2</sub> O = NA B <sub>x</sub> = NA
17				No Recovery	NA	NA	
	NA	8	0		NA	NA	
				No Recovery	NA	NA	
	NA	13	0		NA	NA	

NOTES:  
 Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 42 Cyclone 550 W/3' ho  
 Coffer: TOP BARRE John Vardine  
CRAIG COULTER

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

see p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 04.19	PROJECT NAME: 4- RCRA Well Program	
BORING NUMBER: 33221 11/192	COORDINATES:	DATE: 11/2/92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 11/1/92
ENGINEER/GEOLOGIST: D.O'Brien	Depth Date/Time	DATE COMPLETED: 11/2/92
DRILLING METHODS: Cable Tool	PAGE 7	OF 17

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER MIN	RECOVERY MIN	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY % (LL)	REMARKS
5.25 5.25 5.25	65021 46219	5	6	Stiff, 2.54 (51) Gray silty clay w/ gravel, mod. plasticity, slightly moist.	cl	1.5	HNu = 0 ppm Bs = 60 cpm
5.50 5.50 5.50	65022 46219	10	6	SAA	cl	1.5	
5.75 5.75 5.75	65023 46219	17	6	SAA	cl	1.5	
6.00 6.00 6.00	NA	5	0	No Recovery	NA	NA	HNu = NA Bs = NA
6.25 6.25 6.25	NA	5	0	No Recovery	NA	NA	
6.50 6.50 6.50	NA	13	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone

Operator: JOE BARRETT John Madine

CRAIG COULTER

SAA - SAME AS ABOVE  
NA - NOT APPLICABLE

see p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.04.19	PROJECT NAME: 4- RCRA Well Program		
BORING NUMBER: 3321	COORDINATES:	DATE: 11/2/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 11/1/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 11/22/92
DRILLING METHODS: Cable Tool	PAGE 8	OF 17	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 100mm	RECOVERY (%)	DESCRIPTION	UNCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
14	1010 G5074	7	6	Stiff, 2.54 (1/4") Gray silty clay with gravel. Mod. plasticity, slightly moist.	CI	1.25	H <sub>2</sub> O = 0 ppm BS = 60 cpm
16	1010 G5075	17	6	SAA	CI	1.5	
22	1010 G5076	27	6	SAA	CI	1.75	
22	1120 G5077	5	5	Med. Stiff, 2.54 (1/4") Gray silty clay w/ gravel, low plasticity, slightly moist.	CI	.75	H <sub>2</sub> O = 0 ppm BS = 60 cpm
23	NA	7	0	No Recovery	NA	NA	
	NA	11	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone

Driller: John Kordine 11/12/92  
CRAIG COULTER

SAA - SAME AS ABOVE  
NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.04.19	PROJECT NAME: 4- RCRA Well Program	
BORING NUMBER: 3821	COORDINATES:	DATE: 11/2/92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D.O'Brien	Depth Date/Time	DATE COMPLETED: 6/22/92
DRILLING METHODS: Cable Tool	PAGE 9 OF 17	

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0m	RECOVERY %	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
11.30	GSCTE 1130	4	6	Med St AF. 2.5y(15/1) Gray Silty clay w/ gravel low plasticity, slightly moist	CI	75	H <sub>2</sub> O = 9ppm R <sub>8</sub> = 60cpm
25	NA	8	0	No Recovery	NA	NA	
25	NA	16	0	No Recovery	NA	NA	
26	NA	3	0	No Recovery	NA	NA	H <sub>2</sub> O = NA R <sub>8</sub> = NA
26	NA	6	0	SAA - No Recovery	NA	NA	
	NA	12	0	SAA - No Recovery	NA	NA	

NOTES:  
 Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 42 Cyclone  
 Driller: Jay Bartle J. Jaccari 4/10/92  
CRAIG COULTER 6/30

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 04.19	PROJECT NAME: 4- RCRA Wall Program		
BORING NUMBER: 2821	COORDINATES:	DATE: 6/18/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 6/22/92
DRILLING METHODS: Cable Tool	PAGE 10 OF 17		

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.1 IN	RECOVERY %	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY % (SI)	REMARKS
	6950 65079 6/18/92	3	6	STIFF. 2.5Y (5/1) Gray silty clay w/ gravel, low plasticity, slightly moist	CI	1.25	HMU = 0 ppm BS = 60 cpm
	NA	6	0	No Recovery	NA	NA	
26	NA	10	0	No Recovery	NA	NA	
	1010 65080 6/18/92	6	6	Hard. 2.5Y (5/1) Gray silty clay w/ gravel low plasticity, slightly moist.	CI	4.0	HMU = 0 ppm BS = 80 cpm
29	1010 65081 6/18/92	8	6	SAA	CI	4.25	
	NA	8	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling  
 Drilling Equipment: 42 Cyclone  
 Driller: Jay BATTLE - J. Jordan, DSO  
CRAIG COULTER 6/22/92

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

see p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 04.19		PROJECT NAME: 4- RCRA Well Program	
BORING NUMBER: 3821	COORDINATES:	DATE: 6/8/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 6/23/92
DRILLING METHODS: Cable Tool			PAGE 11 OF 17

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 100mm	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
1020 65082 6/8/92	18	6	6	Hard 2.54 (5/16) Gray silty clay w/ gravel no plasticity, dry some black organics	cl	40	HNu = 0 ppm Bs = 80 cpm
31 NA	32	0	0	No Recovery	NA	NA	
NA	40	0	0	No Recovery	NA	NA	
1330 NA 6/8/92	10	0	0	No Recovery	NA	NA	HNu = NA Bs = NA
32 NA	32	0	0	SAA - No Recovery	NA	NA	
NA	13	0	0	SAA - No Recovery	NA	NA	

NOTES:  
 Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 42 Cyclone  
 Driller: JOE BARILE J. Jacomini 050  
CRAIG COULTER 6/8/92  
 SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE  
 See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 1602 04.19	PROJECT NAME: 4- RCRA Well Program		
BORING NUMBER: 3821	COORDINATES:	DATE: 6/7/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6/1/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 6/22/92
DRILLING METHODS: Cable Tool	PAGE 12		OF 17:

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0 IN	RECOVERY %	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY INDEX	REMARKS
1340	65033	6	6	V. STIFF. 2.5Y (5/1) Gray silty sandy clay w/ gravel no plasticity, slight moist	CI	2.25	H <sub>2</sub> O = 0 ppm R <sub>8</sub> = 60 cpm
6/8/92 1340	65034	8	6	SAA, STIFF	CI	1.5	
6/16/92	NA	13	0	No Recovery	NA	NA	
1350	65035	38	6	STIFF. 2.5Y (5/2) Grayish brown, sandy gravelly clay, no plasticity, slightly moist	CI	1.5	H <sub>2</sub> O = 0 ppm R <sub>8</sub> = 60 cpm *Base of fill at 35.0ft
6/8/92 1350	65036	30 1/4	3	Dense. 2.5Y (5/2) Grayish brown, fine sand poorly graded, dry	SP NA 6/8/92 7/6/92	NA	Top of Aquifer
6/16/92	NA	NA	0	No Recovery	NA	NA	*Rain sample empty. XAF.

NOTES:  
 Drilling Contractor: Pennsylvania Drilling  
 Drilling Equipment: 42 Cyclone  
 Driller: Jay Bartlett J. Saccon 6/8/92  
Craig Coulter  
 SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE  
 See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>100-04-19</u>	PROJECT NAME: <u>4-RCRA Well Program</u>		
BORING NUMBER: <u>3821</u>	COORDINATES:	DATE <u>1/18/92</u>	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <u>1/11/92</u>
ENGINEER/GEOLOGIST: <u>D. O'Brien</u>	Depth	Date/Time	DATE COMPLETED: <u>6/22/92</u>
DRILLING METHODS: <u>Cable Tool</u>	PAGE <u>13</u>		OF <u>17</u>

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0 IN	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%TSF)	REMARKS
41.5	1510 US07 1/18/92	8 1/2	10	1. Dense 2.54 (1/3) Light yellowish brown, medium coarse sand, possibly poorly graded, dry	SP	NA	HNO = 0 ppm RS = 40 cpm
46.5	1545 US38 1/18/92	4 1/2	12	1. Dense 2.54 (1/3) Light yellowish brown, medium coarse sand, well sorted, dry	SP	NA	HNO = 0 ppm RS = 40 cpm
51.5	1650 US39 1/18/92	7	8	1. Dense 2.54 (1/3) Light yellowish brown, medium coarse sand, dry	SP	NA	HNO = 0 ppm RS = 40 cpm
56.5	1680 US00 1/18/92	5 1/3	7	1. Dense 2.54 (1/3) Light yellowish brown coarse sand, possibly poorly sorted, slightly moist	SP	NA	HNO = 0 ppm RS = 40 cpm
61.5	0903 US09 1/19/92	17	15	1. Dense 2.54 (1/3) Light olive brown coarse sand, well sorted, possibly poorly, moist	SP	NA	HNO = 0 ppm RS = 40 cpm
Approximate Water Table level ▼							
66.5	0945 US02 1/19/92	16	6	1. Dense 2.54 (1/3) Light olive brown, coarse sand & gravel well graded, wet	SW	NA	HNO = 0 ppm RS = 40 cpm

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment 42 Cyclone

Driller: JOE RABBLE J. Scociani ASO  
CRAIG COULTER 1/18/92

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>W09.04.19</u>	PROJECT NAME: <u>4-RCRA Well Program</u>	
BORING NUMBER: <u>2701</u>	COORDINATES:	DATE: <u>11/19/92</u>
ELEVATION:	GWL: Depth      Date/Time	DATE STARTED: <u>11/11/92</u>
ENGINEER/GEOLOGIST: <u>D.O'Brien</u>	Depth      Date/Time	DATE COMPLETED: <u>6/22/92</u>
DRILLING METHODS: <u>Cable Tool</u>	PAGE <u>14</u> OF <u>17</u>	

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0 FT	RECOVERY ft	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
71.5	15000 65083 11/19/92	14	18	V. Dense 2.54 (10/16) Light olive brown coarse sand w/ gravel well graded, wet	SW	NA	H <sub>25</sub> = 0 ppm R <sub>6</sub> = 40 cpm
75	15000 65084 11/19/92	15	15	M. Dense 2.54 (10/16) Light olive brown, coarse sand w/ gravel well graded, wet	SW	NA	H <sub>25</sub> = 0 ppm R <sub>6</sub> = 10 cpm
81.5	15000 65085 11/19/92	10	18	V. Dense 2.54 (10/16) Light olive brown coarse sand w/ gravel well graded, wet	SW	NA	H <sub>25</sub> = 0 ppm R <sub>6</sub> = 40 cpm
86.5	NA	13	10	<del>1.5-2.54 (10/16) Light olive brown coarse sand w/ gravel well graded, wet</del> No Recovery	NA	NA	H <sub>25</sub> = NA R <sub>6</sub> = NA
90.5	15000 65086 11/19/92	13	18	M. Dense 2.54 (10/16) Light olive brown coarse sand w/ gravel well graded, wet	SW	NA	H <sub>25</sub> = 0 ppm R <sub>6</sub> = 40 cpm
96.5	15000 65087 11/19/92	16	18	V. Dense 2.54 (10/16) Light olive brown fine sand w/ gravel well graded, wet	SW	NA	H <sub>25</sub> = 0 ppm R <sub>6</sub> = 50 cpm

NOTES:  
 Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 42 Cyclone  
 Driller: JOE BARTLE / Tom Ferracani  
CRAIG COULTER

SAA - SAME AS ABOVE  
 NA - NOT APPLICABLE

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>100-04-19</u>	PROJECT NAME: <u>4-RCRA Well Program</u>	
BORING NUMBER: <u>2721</u>	COORDINATES:	DATE: <u>11/1/92</u>
ELEVATION:	GWL: Depth      Date/Time	DATE STARTED: <u>11/1/92</u>
ENGINEER/GEOLOGIST: <u>D.O'Brien</u>	Depth      Date/Time	DATE COMPLETED: <u>6/22/92</u>
DRILLING METHODS: <u>Cable Tool</u>	PAGE <u>15</u> OF <u>17</u> :	

DEPTH ft	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1.0 FT	RECOVERY %	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY %TSF	REMARKS
101.5	1550 USDP 11/1/92	17 13 25	15	V. D. med. 2.54 (10) Light olive brown fine sand poorly graded	SP	NA	HNO = 0 ppm RS = 300 ppm
105	1551 USDP 11/1/92	21 17 22	15	V. D. med. 2.54 (10) Light olive brown coarse sand poorly graded, med.	SP	NA	HNO = 0 ppm RS = 300 ppm
110	1552 USDP 11/1/92	14 12	6	V. D. med. 2.54 (10) Light olive med. fine sand w/ gravel & poorly graded, med.	SP	NA	HNO = 0 ppm RS = 650 ppm
115	1553 USDP 11/1/92	13 16	15	V. D. med. 2.54 (10) Light olive brown med coarse sand w/ gravel & poorly graded, med.	SP	NA	HNO = 0 ppm RS = 650 ppm
121.5	1554 USDP 11/1/92	11 8	8	med. 2.54 (10) Light olive brown coarse sand w/ gravel, poorly graded, med.	SP	NA	HNO = 0 ppm RS = 600 ppm
				Boring terminated at 121.5 ft No "Blue Clay" encountered			
							HNO = CA 7/6/92

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: 42 Cyclone 11/1/92

Driller: JOE BARRETT & CRAIG COULTER

SAA - SAME AS ABOVE  
NA - NOT APPLICABLE

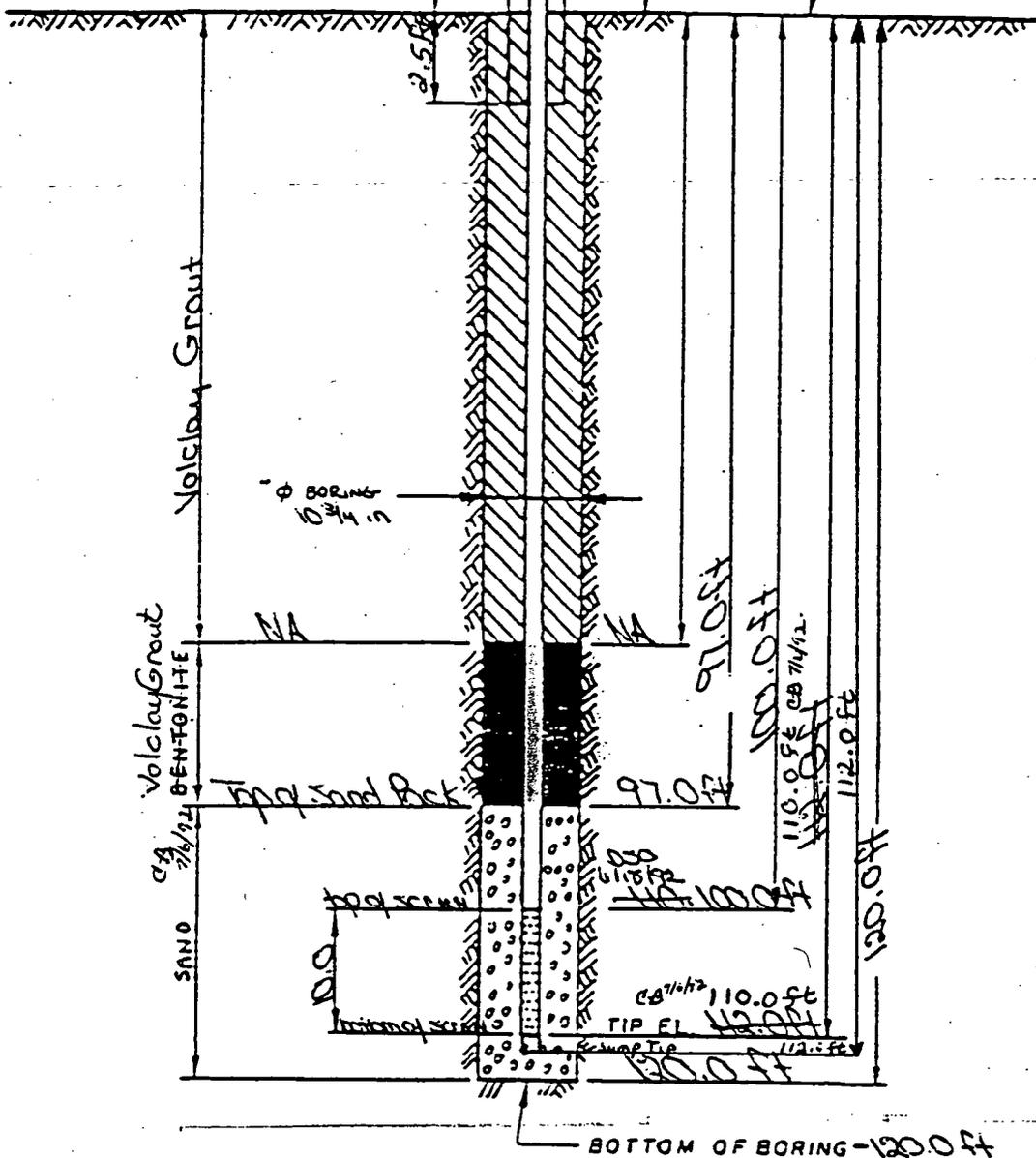
See p. 1

**FERNALD  
RI/FS**

PROTECTIVE RISER CASING

Hinged cover with padlock.

APPROXIMATE EXISTING  
GROUND SURFACE  
EL



DRAWING NUMBER	
CHECKED BY	
APPROVED BY	
DRAWN BY	

**NOTES:**

1. RISER PIPE IS 1/2 IN 10. SCHEDULE PIPE, THREADED, FLUSH-JOINTED.
  2. SCREEN IS 4 IN 1.0316 S.S PIPE CONTINUOUS SLOT SCREEN (0.070 IN. SLOT SIZE)
  3. LOWER END OF SCREEN IS CAPPED.
  4. ELEVATION OF WATER LEVEL 60.94 FT
  5. WATER LEVEL READING ON 06-22-92
- Materials used during well installation  
 10 bags Volclay sand  
 23 bags Volclay Grout  
 1000 gal. water

INSTALLATION DETAILS  
MONITORING WELL 3821

PREPARED FOR  
FMPC RI/FS

12 soil drums / 2 water drums

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME 4 RCRA Wells FIELD ENG./GEO. D. O'Brien DATE 11/22/92  
 PROJECT NO. 102.04.19 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BORING NO. 3821  
 PIEZOMETER NO. 3821 DATE OF INSTALLATION 06/10/92 - 06/22/92

**BOREHOLE DRILLING**

DRILLING METHOD <u>Cable Tool</u>	TYPE OF BIT <u>Churn Bit</u>
DRILLING FLUID (S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0.0 ft</u> TO <u>120.0 ft</u> FLUID _____ FROM _____ TO _____	CASING SIZE (S) USED: SIZE <u>10.0 in</u> FROM <u>0.0</u> TO <u>120.0</u> SIZE _____ FROM _____ TO _____

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring Well</u>	RISER PIPE MATERIAL <u>316 Stainless Steel</u>
DIAMETER OF PERFORATED SECTION <u>4.0 ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 in</u> I.D. <u>4.0 in</u>
PERFORATION TYPE: SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>1-10ft screen w/ 10ft casing</u> <u>11-10ft sections</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 in</u>	JOINING METHOD <u>Flare joint</u> <u>threaded - screw type</u>
TOTAL PERFORATED AREA <u>10.0 ft</u>	

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft</u>	OTHER PROTECTION <u>Hinged locking cover</u>
PROTECTIVE PIPE O.D. <u>10 3/4 in</u>	<u>with padlock</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 97.0	TCP	BOTTOM
BENTONITE - None Used	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND - 10/20	TOP 97.0	BOTTOM 120.0	TOP	BOTTOM
GRAVEL - None Used	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 100.0	BOTTOM 110.0	TOP	BOTTOM
PIEZOMETER TIP	112.0			
BOTTOM OF BOREHOLE	120.0			
GWL AFTER INSTALLATION	60.94 ft			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS 12 soil drums / 2 water drums

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1839	COORDINATES:	DATE: 6-24-92
ELEVATION:	GWL: Depth 5.51 Date/Time 6-29-92 / 1300	DATE STARTED: 6-24-92
ENGINEER/GEOLOGIST: K. Marion	Depth Date/Time	DATE COMPLETED: 6-25-92
DRILLING METHODS: 8" Hollow Stem Auger		PAGE / OF 35

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in. 1)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (15SF)	REMARKS
2.0	098316 1025 6-24-92	3	6	Medium dense light olive brown (2.5Y, 5/4) silt with grass and root fragments, dry	ML	N/A	CB-7/6/92 H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098317 1025 6-24-92	8	4	medium dense light olive brown (2.5Y, 5/4) clayey silt with trace organic matter, slightly moist	ML	N/A	
		13	0	No Recovery	N/A	N/A	
		13	0	No Recovery	N/A	N/A	
2.0	098318 1040 6-24-92	5	6	Dense light olive brown (2.5Y, 5/6) clayey silt with trace organic matter, slightly moist	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm A 3" split spoon was driven to collect Full HSL & RAO samples
	098318 1040 6-24-92	13	6	Same As Above	ML	N/A	
	098319 1040 6-24-92	31	6	Same As Above	ML	N/A	
3.5	098320 1250 6-24-92	8	6	Dense light yellowish brown (2.5Y, 6/3) CLAYEY SILT, slightly moist	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098321 1250	12	6	Same As Above	ML	N/A	
	098322 1250 6-24-92	32	4	Same As Above	ML	N/A	
5.0	098323 1300 6-24-92	9	6	Same As Above	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm water level = 5.51 ft. below ground surface
	098323 1300 6-24-92	18	6	Same As Above	ML	N/A	
	098324 1300 6-24-92	29	6	Same As Above	ML	N/A	
5.5	098325 1405 6-24-92	6	6	Light olive gray (5Y, 6/2) clayey silt with a little yellowish brown (10YR, 5/8) silt, slightly moist	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
7.5	098325 1405 6-24-92	10	6	Same As Above	ML	N/A	

NOTES  
Contractor: Pennsylvania Drilling  
Rig: Mobile 80 Auger Rig  
Driller: Dave Newman  
Assistant Driller: Bob Johnson

Samples Collected per ASTM Standard Penetration Test  
Colors Identified using Munsell Color Chart

6-24-92  
Background Levels: H<sub>nu</sub>: 0 ppm  
B<sub>r</sub>: 60 cpm  
α: 0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1839	COORDINATES:	DATE: 6-24-92
ELEVATION:	GWL: Depth 5.51 Date/Time 6-29-92 1300	DATE STARTED: 6-24-92
ENGINEER/GEOLOGIST: K. Marign	Depth Date/Time	DATE COMPLETED: 6-25-92
DRILLING METHODS: 8" Hollow Stem Auger		PAGE 2 OF 35

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6" (in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USCS)	REMARKS
7.5	098327 1405 6-24-92	15	5	Light olive gray (5Y, 6/2) clayey silt with a little yellowish brown (10YR, 5/8) silt, slightly moist	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
8.0	098328 1440 6-24-92	8	6	stiff olive (5Y, 5/3) silty clay, medium plasticity, moist	CL	1.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098329 1440 6-24-92	10	6	Same As Above	CL	1.5	
9.5	015330 1440 6-24-92	11	6	stiff gray (5Y, 5/1) silty clay, medium plasticity, moist	CL	1.5	
	N/A 1500 6-24-92	5	0	No Recovery	N/A	N/A	H <sub>nu</sub> = N/A B <sub>r</sub> = N/A α = N/A
		8	0	No Recovery	N/A	N/A	
11.0		8/10	0	No Recovery	N/A	N/A	
	098331 1530 6-24-92	7	6	soft gray (5Y, 5/1) clay, low plasticity, wet	CL	1.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098332 1530 6-24-92	12	6	Medium dense gray (5Y, 5/1) poorly graded Medium SAND, wet, <sup>K.M. 6-24-92</sup> poorly graded	SP	N/A	
2.5	098333 1530 6-24-92	15	3	Same As Above	SP	N/A	
	098334 1545 6-24-92	7	6	Dense gray (5Y, 5/1) poorly graded Medium SAND, wet	SP	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098335 1545 6-24-92	16	6	Same As Above	SP	N/A	
14.0	098336 1545 6-24-92	18	6	Same As Above	SP	N/A	
	098337 1000 6-25-92	7	6	Medium dense light olive brown (2.5Y, 5/4) medium SAND, wet	SW	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
15.0	098338 1000 6-25-92	11	6	Same As Above	SW	N/A	

NOTES: K.M. 6-29-92

SEE PAGE 1

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: 1839	COORDINATES:	DATE: 6-25-92	
ELEVATION:	GWL: Depth 5.51	Date/Time 6-24-92 / 1300	DATE STARTED: 6-24-92
ENGINEER/GEOLOGIST: K. Marion	Depth	Date/Time	DATE COMPLETED: 6-25-92
DRILLING METHODS: 8" Hollow Stem Augers			PAGE 3 OF 25

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in. 1)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ITSF)	REMARKS
15.0	N/A						
15.5	1000 6-25-92	11	6	No Recovery	N/A	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098340 1015 6-25-92	12	6	Dense light olive brown (2.5%, 5/4) poorly graded Medium SAND, wet	SP UW	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098341 1015 6-25-92	17	6	Same As Above	SP SW	N/A	
	098342 1015 6-25-92	23	2	Dense grayish brown (2.5%, 5/2) poorly graded Medium SAND, wet	SP SW	N/A	
17.0	098343 1040 6-25-92	13	6	Dense light olive brown (2.5%, 5/6) poorly graded medium SAND, wet	SP SW	N/A	H <sub>nu</sub> = 0 B <sub>r</sub> = 60 α = 0
	098344 1040 6-25-92	16	6	Dense grayish brown (2.5%, 5/2) poorly graded gravelly medium SAND, wet	SP SW	N/A	
18.5	098345 1040 6-25-92	22	2	Same As Above	SP SW	N/A	
	098346 1100 6-25-92	13	6	Medium dense light olive brown (2.5%, 5/4) poorly graded medium SAND, wet	SP SW	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 60 cpm α = 0 cpm
	098347 1100 6-25-92	16	6	Same As Above	SP SW	N/A	
	098348 1100 6-25-92	7	6	Medium dense grayish brown (2.5%, 5/2) well graded SAND, wet	SW	N/A	
20.0				Bottom of Bore Hole - 20.0			

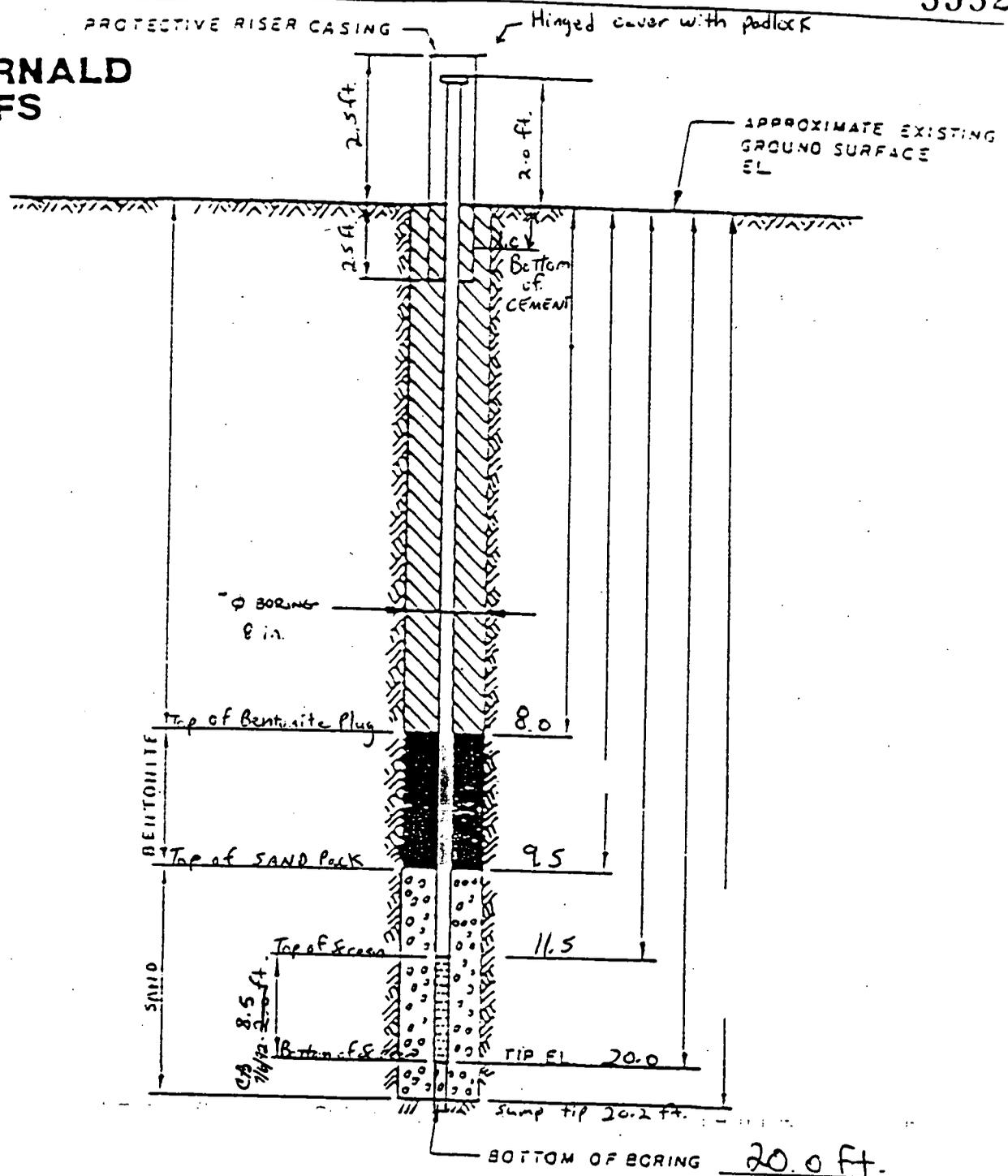
CB  
7/6/92

NOTES

SEE PAGE 1

**FERNALD  
RI/FS**

DRAWING NUMBER  
  
  
  
CHECKED BY  
APPROVED BY  
  
DRAWN BY



**NOTES:**

1. RISER PIPE IS 2 IN. I.D. SCHEDULE 40 PVC PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN IS 2 IN. I.D. PVC PIPE CONTINUOUS SLOT SCREEN (0.020 IN. SLOT SIZE)
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL 5.51 FT
5. WATER LEVEL READING ON 6/29/92

INSTALLATION DETAILS  
MONITORING WELL #1039

PREPARED FOR

FEMP RI/FS

Materials used during well installation:  
 1 80 lb. bag of 10/20 SAND  
 1 1/2 50 lb. bags of vulclay grout  
 1/2 5 gallon bucket of bentonite pellets  
 36 gallons of water used during well installation

pipe sections: 8.5 ft. screen with 0.2 ft. silt trap, 1-10 ft., 1-3.5 ft.

**PIEZOMETER INSTALLATION SHEET**

3532

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. K. Marrien DATE 6-29-92  
 PROJECT NO. 602.50.0307 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BORING NO. 1839  
 PIEZOMETER NO. 1839 DATE OF INSTALLATION 6-25-92

**BOREHOLE DRILLING**

DRILLING METHOD <u>8" Hollow Stem Auger</u>	TYPE OF BIT <u>Bull Dog - Hollow Auger</u>
DRILLING FLUID (S) USED: FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	CASING SIZE (S) USED: SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring Piezometer</u>	RISER PIPE MATERIAL <u>PVC schedule 40</u>
DIAMETER OF PERFORATED SECTION <u>2.0 in. I.D.</u>	RISER PIPE DIAMETERS: O.D. <u>2 3/8 in.</u> I.D. <u>2.0 in.</u>
PERFORATION TYPE: SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/> AVERAGE SIZE OF PERFORATIONS <u>0.020 in.</u>	LENGTH OF PIPE SECTIONS <u>2.5 ft., 10 ft., 3 1/2 ft.</u>
TOTAL PERFORATED AREA <u>20 ft<sup>2</sup> - 8.5 ft<sup>2</sup></u>	JOINING METHOD <u>Screw type - flush joint threaded</u>

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft.</u>	OTHER PROTECTION <u>Hinged locking cover with padlock</u>
PROTECTIVE PIPE O.D. <u>4 1/2 in.</u>	

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	<u>25-2.0</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>2.5</u>			
BOREHOLE FILL MATERIALS: <u>CEMENT GROUT SLURRY</u> <small>L.M. 6-29-92</small>	TOP <u>0.0</u>	BOTTOM <u>1.0</u>		
	TOP <u>1.0</u>	BOTTOM <u>8.0</u>	TCP	BOTTOM
	TOP <u>8.0</u>	BOTTOM <u>9.5</u>	TOP	BOTTOM
	TOP <u>9.5</u>	BOTTOM <u>20.0</u>	TOP	BOTTOM
	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>19.0-11.5</u>	BOTTOM <u>20.0</u>	TOP	BOTTOM
PIEZOMETER TIP	<u>20.2</u>			
BOTTOM OF BOREHOLE	<u>20.0</u>			
GWL AFTER INSTALLATION	<u>5.51</u>			

AS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 AS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS \_\_\_\_\_

**PIEZOMETER INSTALLATION SHEET**

3532

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. Ken Marica DATE 6-23-92  
 PROJECT NO. 602-50.03.07 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BORING NO. 1841  
 PIEZOMETER NO. N/A DATE OF INSTALLATION 6-23-92

**BOREHOLE DRILLING**

DRILLING METHOD <u>8" Hollow Stem Auger</u>	TYPE OF BIT <u>Bull Dog - Hollow Auger</u>
DRILLING FLUID (S) USED: FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	CASING SIZE (S) USED: SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>N/A</u>	RISER PIPE MATERIAL <u>N/A</u>
DIAMETER OF PERFORATED SECTION <u>N/A</u>	RISER PIPE DIAMETERS: O.D. <u>N/A</u> I.D. <u>N/A</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>N/A</u>
AVERAGE SIZE OF PERFORATIONS <u>N/A</u>	JOINING METHOD <u>N/A</u>
TOTAL PERFORATED AREA <u>N/A</u>	

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>N/A</u>	OTHER PROTECTION <u>N/A</u>
PROTECTIVE PIPE O.D. <u>N/A</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft.)		ELEVATION (ft.)	
	TOP	BOTTOM	TOP	BOTTOM
TOP OF RISER PIPE	<u>N/A</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>N/A</u>			
BOREHOLE FILL MATERIALS: <del>CEMENT GROUT/SLURRY</del> <u>km. 6-23-92</u> BENTONITE <del>SAND</del> GRAVEL	Top <u>0.0</u>	Bottom <u>1.0</u>		
	TOP <u>1.0</u>	BOTTOM <u>20.0</u>	TCP	BOTTOM
	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP	BOTTOM
	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP	BOTTOM
PIEZOMETER TIP	<u>N/A</u>			
BOTTOM OF BOREHOLE	<u>20.0</u>			
GWL AFTER INSTALLATION	<u>N/A - Dry</u>			

AS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 AS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS \_\_\_\_\_

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-50.03 07	PROJECT NAME: FEMP RI/FS
BORING NUMBER: 1941	COORDINATES:
ELEVATION:	GWL: Depth N/A <sup>Dry</sup> Date/Time N/A
ENGINEER/GEOLOGIST: K. Marion	Depth N/A Date/Time N/A
DRILLING METHODS: Auger 8" O.D. Hollow Stem Augers	PAGE 1 OF 5

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 (in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	098210 6-17-92 1305	6	6	Loose dark grayish brown (2.5Y, 4/2) SILTY GRAVEL with clay and sand, dry	GM GG	N/A	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 80 cpm c = 0 cpm
	NA	8	0	No Recovery	N/A	N/A	
	NA	16	0	No Recovery	N/A	N/A	
1.5	098211 6-17-92 1315	5	6	Very stiff light olive brown (2.5Y, 5/4) SILTY CLAY with sand and a little gravel, low plasticity, slightly moist	CL	3.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 80 cpm c = 0 cpm
	NA	5	0	No Recovery	N/A	N/A	
2.5	098212 6-17-92 1335	8	3	Very stiff dark yellowish brown (10YR, 4/4) CLAY, medium plasticity, moist	CL	2.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 80 cpm c = 0 cpm
	NA	10	0	No Recovery	N/A	N/A	
	NA	10	0	No Recovery	N/A	N/A	
4.5	098213 6-17-92 1340	9	6	Very stiff light olive brown (2.5Y, 5/4) SILTY CLAY with sand and trace wood fragments, a little strong brown (7.5YR, 4/6) and yellow (5Y, 7/6) staining, medium plasticity, slightly moist	CL	2.0	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 80 cpm c = 0 cpm
	098214 6-17-92 1340	8	4	Same As Above	CL	2.0	
	NA	9	0	No Recovery	N/A	N/A	
6.0	098215 6-17-92 1415	1	6	stiff light olive brown (2.5Y, 5/4) SILTY CLAY with trace sand, organic matter (fine soft fragments and charred wood?), and trace light gray (5Y, 7/1) mottling, medium plasticity, moist	CL	1.0	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 80 cpm c = 0 cpm
	098217 6-17-92 1415	2	6		CL	1.0	
7.5	NA	1	0	No Recovery	N/A	N/A	

NOTES  
 Contractor: Pennsylvania Drilling Rig; Mobile 80 Auger Rig  
 Driller: Dave Newman  
 Assistant Driller: Bob Johnson  
 Samples Collected per ASTM Standard Penetration Test Colors Identified using Munsell Color Chart  
 Background Levels: H<sub>nu</sub> = 0 ppm  
 B<sub>r</sub> = 80 cpm  
 c = 0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.50.0307	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1841	COORDINATES:	DATE: 6-17-92
ELEVATION:	GWL: Depth N/A Date/Time N/A	DATE STARTED: 6-17-92
ENGINEER/GEOLOGIST: K. Marion	Depth N/A Date/Time N/A	DATE COMPLETED: 6-23-92
DRILLING METHODS: Auger	PAGE 2 OF 5	

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 10 in. 1	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	098248 6-17-92 1430	5	6	STIFF light olive brown (SY, S/M) CLAY with trace sand and gravel, medium plasticity, moist	CL	1.0	H <sub>nu</sub> = 0 ppm BT = 80 cpm α = 0 cpm
	098249 6-17-92 1430	5	3	Same As Above	CL	1.0	
	NA	5	0	No Recovery	N/A	N/A	
9.0	098300 6-17-92 1440	3	6	STIFF olive gray (SY, S/2) CLAY with SAND and gravel, trace root fragments, medium plasticity, moist	CL	1.5	H <sub>nu</sub> = 0 ppm BT = 80 cpm α = 0 cpm
	098301 6-17-92 1440	5	6	Same As Above	CL	1.5	
	098301 6-17-92 1440	10	6	stiff olive gray (SY, S/2) GRAVELLY CLAY with sand and trace root fragments, medium plasticity, moist	CL	1.5	A 3" split spoon was driven to collect Full HSL and RAD Samples
	098302 6-17-92 1440	12	6	Same As Above	CL	1.5	The spoon was advanced two feet to ensure enough recovery for sample collection
11.0	098304 6-19-92 6-19-92	1	6	Very STIFF light olive brown (2-SY, S/M) silty clay with gravel clay with SAND and gravel, medium plasticity, moist	CL	3.0	H <sub>nu</sub> = 0 ppm BT = 80 cpm α = 0 cpm
	098305 6-19-92 6-19-92	6	6	Same As Above	CL	2.5	
	098305 6-19-92 6-19-92	18	6	Same As Above	CL	3.0	Drove a 3" split spoon to collect Full HSL and RAD samples
12.5	098306 6-22-92 6-22-92	3	6	Very stiff light olive brown (2-SY, S/M) silty clay with sand and gravel, low plasticity, moist	CL	2.5	H <sub>nu</sub> = 0 ppm BT = 80 cpm α = 0 cpm
	098307 6-22-92 6-22-92	9	2	Same As Above	CL	2.5	
		19	0	No Recovery	N/A	N/A	
14.0				Continued on next page			

NOTES: 6-19-92  
Background Levels: H<sub>nu</sub> = 0 ppm  
BT = 80 cpm  
α = 0 cpm

SEE PAGE 1

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VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1841	COORDINATES:	DATE: 6-22-92
ELEVATION:	GWL: Depth N/A Date/Time N/A	DATE STARTED: 6-17-92
ENGINEER/GEOLOGIST: K. Marier	Depth N/A Date/Time N/A	DATE COMPLETED: 6-23-92
DRILLING METHODS: Auger	PAGE 3 OF 85	

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 (in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISF)	REMARKS
14.0	098305 1010 6-22-92	15	4	Very stiff olive (5Y, 5/4) Gravelly CLAY, with sand, low plasticity, moist	CL	2.5	H <sub>nu</sub> = 0 ppm B <sub>T</sub> = 80 cpm α = 0 cpm
	NA	21	0	No Recovery	N/A	N/A	
	NA	26	0	No Recovery	N/A	N/A	
15.5	098309 1030 6-22-92	2	6	Very stiff gray (5Y, 5/1) silty clay with sand, low plasticity, moist	CL	2.5	H <sub>nu</sub> = 0 ppm B <sub>T</sub> = 80 cpm α = 0 cpm
	098310 1030 6-22-92	8	9	Same As Above medium dense yellowish brown (10YR, 5/8) clayey silt, moist	CL	2.5	16.3 ft
	NA	12	0	No Recovery	N/A	N/A	
17.0	098311 1045 6-22-92	30	6 <sup>12.16</sup> 6 <sup>12.32</sup>	Very dense light yellowish brown (2.5Y, 2/4) well graded sand, moist Very dense yellowish brown (10YR, 5/8) silt, slightly moist Very stiff gray (5Y, 5/1) gravelly clay with sand, low plasticity, slightly moist	SC ML CL	N/A N/A 2.5	H <sub>nu</sub> = 0 ppm B <sub>T</sub> = 80 cpm α = 0 cpm The split spoon began to become in the hole so driving of the sample ceased so that we could observe what's causing the abstraction.
	NA	36	0	No Recovery	N/A	N/A	
18.0	1330 6-22-92	21	0	No Recovery	N/A	N/A	H <sub>nu</sub> = N/A B <sub>T</sub> = N/A α = N/A
	NA	46	0	No Recovery	N/A	N/A	
	NA	48	0	No Recovery	N/A	N/A	
	NA	49	0	No Recovery	N/A	N/A	
20.0				Bottom of Bore Hole Dry Hole			

CB 7/6/92

NOTES: Abandoned hole - P+A

SEE PAGE 1

Background Levels: 6-22-92  
H<sub>nu</sub>: 0 Ppm  
B<sub>T</sub>: 80 cpm  
α: 0 cpm

Ken Burnhart of ASI's Health & Safety department says he observed a deep excavation made at this site previously. He says a fill material was placed into the excavation (i.e. soil)

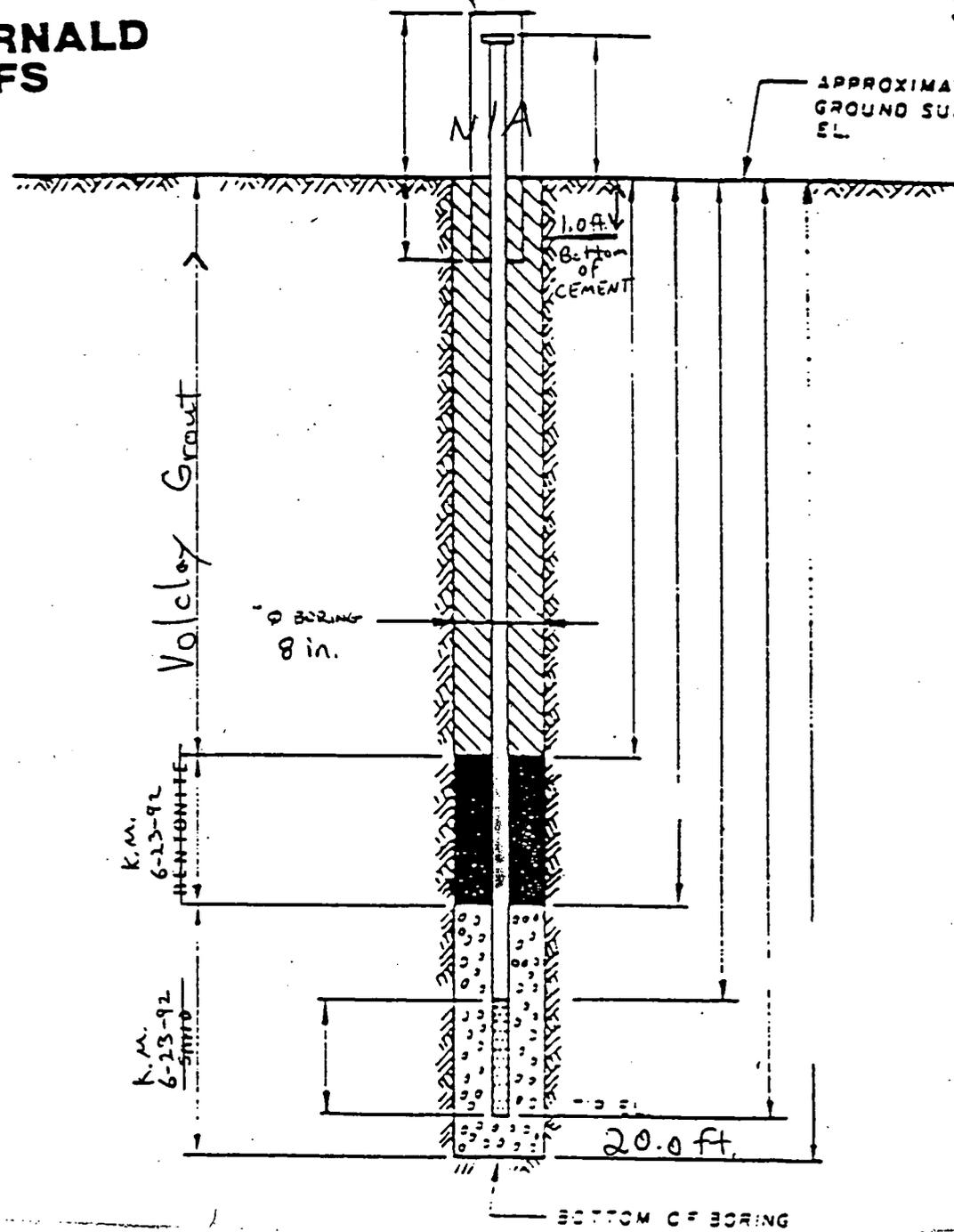
3532

# FERNALD RI/FS

K.M. 6-23-92  
PROTECTIVE RISER CASING

APPROXIMATE EXISTING GROUND SURFACE EL.

DRAWING NUMBER
CHECKED BY
APPROVED BY
K. Maclean 6-23-92
DRAWN BY



### NOTES:

1. RISER PIPE IS 2 IN I.D SCHEDULE 40 PVC PIPE, THREADED, FLUS--JOINTED.
2. SCREEN IS 2 IN I.D PVC PIPE CONTINUOUS SLOT SCREEN (0.020 IN SLOT SIZE)
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL N/A
5. WATER LEVEL READING ON N/A

Materials used during Abandonment of hole  
 1 1/2-bags of Volclay grout (each bag weighs 50lbs.)  
 1/2-50 lb. bag of cement  
 35-gallons of water are used to mix grout and cement

INSTALLATION DETAILS  
~~MONITORING WELL~~  
 Abandoned Hole # 7841 (Boring)

PREPARED FOR  
 FEMP RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1842	COORDINATES:	DATE: 6-15-92
LEVELATION:	GWL: Depth 5.52 ft Date/Time 6-17-92 / 0830	DATE STARTED: 6-15-92
ENGINEER/GEOLOGIST: Ken Mariani	Depth Date/Time	DATE COMPLETED: 6-16-92
DRILLING METHODS: Auger	8" O.D. Hollow Stem Augers	PAGE 1 OF 24

DEPTH ft.	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 1.6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISSF)	REMARKS
0	098271 6-15-92 1340	15	6	Medium dense light yellowish brown (2.5Y, 6/3) gravelly silt with a little clay and organic matter, dry	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>γ</sub> = 40 cpm α = 0 cpm
	098272 6-15-92 1340	16	6	Same As Above	ML	N/A	
1.5	N/A 6-15-92 1340	12	2	Same As Above	ML	N/A	Neglected to collect the archive sample for the interval between 1.0-1.5 ft.
	098273 6-15-92 1250	8	6	Medium dense yellowish brown (10YR, 5/6) clayey SAND with a little fine gravel, moist	SC	N/A	H <sub>nu</sub> = 0 cpm B <sub>γ</sub> = 40 cpm α = 0 cpm
	098274 6-15-92 1350	11	6	Same As Above	SC	N/A	
3.0	098275 6-15-92 1350	9	6	Same As Above	SC	N/A	
	098276 6-15-92 1400	5	4	<del>Medium dense yellowish brown (10YR, 5/6) clayey SAND with a little fine gravel, moist</del> Medium dense light yellowish brown (2.5Y, 6/3) SANDY SILT, dry	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>γ</sub> = 40 cpm α = 0 cpm
	NA 1400	7	0	No Recovery	N/A	N/A	
4.5	K.M.N/A 6-15-92 1400	7	0	No Recovery	N/A	N/A	
	098277 6-15-92 1430	5	6	Medium dense light olive brown (2.5Y, 5/4) CLAYEY SAND, very moist	SC	N/A	H <sub>nu</sub> = 0 ppm B <sub>γ</sub> = 40 cpm α = 0 cpm
	098278 6-15-92 1430	7	6	Same As Above	SC	N/A	
6.0	098279 6-15-92 1430	7	6	Medium stiff light olive brown (2.5Y, 5/4) SILTY CLAY with a little sand and trace fine gravel, moist, low plasticity	CL	1.0	W.L. = 5.52 ft. Below Ground surface
	098280 6-15-92 1450	7	6	Medium dense light olive brown (2.5Y, 5/4) CLAYEY SAND with trace gravel, moist	SC	N/A	H <sub>nu</sub> = 0 ppm B <sub>γ</sub> = 40 cpm α = 0 cpm
	098281 6-15-92 1450	9	6	Same As Above	SC	N/A	
7.5	098282 6-15-92 1450	11	6	Medium stiff light olive brown (2.5Y, 5/4) SILTY CLAY with sand, low plasticity, moist	CL	1.0	

NOTES

Contractor: Pennsylvania Drilling  
Rig: Mobile 80 Auger Rig  
Driller: Dave Newman  
Assistant Driller: Bob Johnson

Samples Collected per ASTM Standard Penetration Test  
Colors Identified using Munsell color chart

Background Levels: H<sub>nu</sub> = 0 ppm  
B<sub>γ</sub> = 40 cpm  
α = 0 cpm

W.L. = water level

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VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1842	COORDINATES:	DATE: 6-16-92
ELEVATION:	GWL: Depth 5.58 ft. Date/Time 6-17-92/0830	DATE STARTED: 6-15-92
ENGINEER/GEOLOGIST: K. Marion	Depth Date/Time	DATE COMPLETED: 6-16-92
DRIILLING METHODS: Auger	PAGE 2 OF 24	

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6" (in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USF)	REMARKS
7.5	018283 6-16-92 0830	5	6	Stiff light olive brown (2.5Y, 5/4) SILTY CLAY with sand and a little gravel, medium plasticity, moist	CL	1.75	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 40 cpm α = 0 cpm
	018284 6-16-92 0830	6	6	Same As Above	CL	1.75	A 3" split spoon was driven to collect Full H <sub>56</sub> and RAO samples
	018284 6-16-92 0830	11	6	Same As Above	CL	1.75	
20	018286 6-16-92 1015	8	6	Stiff light olive brown (2.5Y, 5/4) SILTY CLAY with sand, medium plasticity, moist	CL	1.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 40 cpm α = 0 cpm
	018287 6-16-92 1015	13	6	Same As Above	CL	1.5	
10.0				Drilled to a depth of 7.5 ft. Split spoon sampled to 10 ft.			

NOTES

SEE PAGE 1

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3532

**FERNALD  
RI/FS**

PROTECTIVE RISER CASING

Hinged cover with padlocks

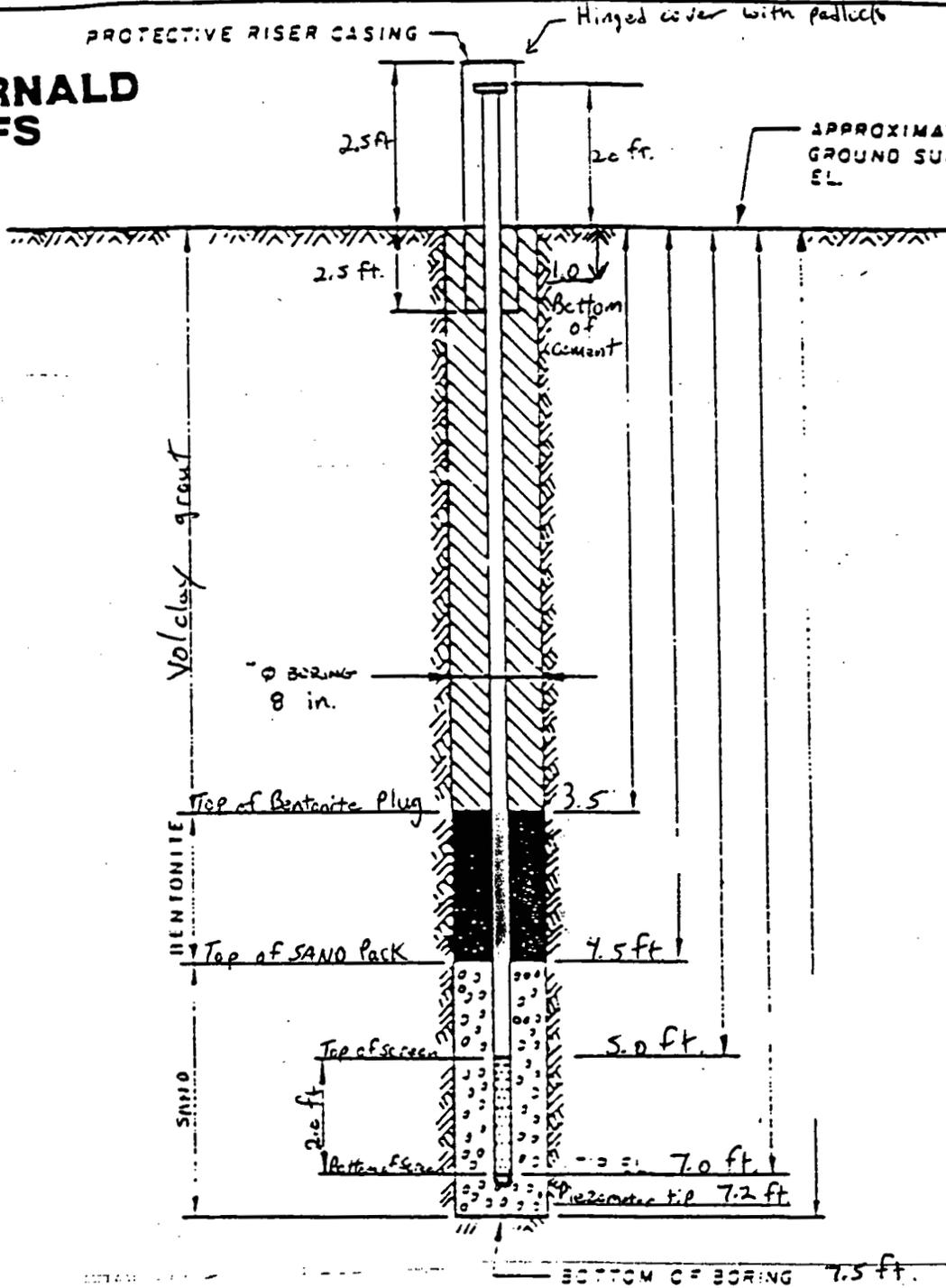
APPROXIMATE EXISTING  
GROUND SURFACE  
EL

DRAWING  
NUMBER

CHECKED BY  
APPROVED BY

K. Medina  
6-26-92

DRAWN  
BY



**NOTES:**

1. RISER PIPE IS 2 IN ID SCHEDULE 40 PVC PIPE, THREADED, FLUS--JOINTED.
2. SCREEN IS 2 IN 1.0 PVC PIPE CONTINUOUS SLOT SCREEN (0.020 IN SLOT SIZE)
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL 5.58 ft.
5. WATER LEVEL READING ON 6-17-92

Materials used during well Installation:

- 1 1/2 - 80 lb bags of sand
  - 1/2 - 5 gallon bucket of bentonite pellets
  - 1/2 - 50 lb bag of Volclay grout
  - 1/2 - 50 lb bag of cement
  - 15 - gallons of water used during installation
- pipe Sections: 1-2 ft. screen, 1-7 ft. riser

INSTALLATION DETAILS  
MONITORING WELL #1842

PREPARED FOR

FEMP RI/FS

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME FEEMP RI/FS FIELD ENG./GEO. K. Macion DATE 6-20-92  
 PROJECT NO. 602.50.03.07 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BORING NO. 1842  
 PIEZOMETER NO. 1842 DATE OF INSTALLATION 6-16-92

**BOREHOLE DRILLING**

DRILLING METHOD <u>Hollow Stem Auger</u>	TYPE OF BIT <u>Bull Dog - Hollow Auger</u>
DRILLING FLUID(S) USED:	CASING SIZE(S) USED:
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring Piezometer</u>	RISER PIPE MATERIAL <u>PVC</u>
DIAMETER OF PERFORATED SECTION <u>2.0 in. ID</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	<sup>K.M. 6-20-92</sup> O.D. <u>2 5/8 in</u> I.D. <u>2.0 in</u>
SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>1-2ft, 1-7ft</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 in</u>	JOINING METHOD <u>Screw type - flush joint threaded</u>
TOTAL PERFORATED AREA <u>2.0 ft</u>	

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft</u>	OTHER PROTECTION <u>hinged locking cover with padlock</u>
PROTECTIVE PIPE O.D. <u>3 1/2 in, 4 1/2 in</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft.)		ELEVATION (ft)	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS: <u>CEMENT GROUT SLURRY</u> K.M. 6-20-92	TOP 0.0	Bottom 1.0		
	TOP 1.0	BOTTOM 3.5	TCP	BOTTOM
	TOP 3.5	BOTTOM 4.5	TOP	BOTTOM
	TOP 4.5	BOTTOM 7.5	TOP	BOTTOM
	TOP N/A	BOTTOM N/A	TOP	BOTTOM
PERFORATED SECTION	TOP 5.0	BOTTOM 7.0	TOP	BOTTOM
PIEZOMETER TIP	7.2			
BOTTOM OF BOREHOLE	7.5			
GWL AFTER INSTALLATION	5.58			

AS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 AS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS \_\_\_\_\_

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602, 50, 03, 07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1843	COORDINATES: 6-92	DATE: 6-8-92
ELEVATION:	GWL: Depth 6.28 Date/Time 6-11-92/1300	DATE STARTED: 6-8-92
ENGINEER/GEOLOGIST: K. Marion	Depth Date/Time	DATE COMPLETED: 6-8-92
DRILLING METHODS: Auger 8" O.D. Hollow Stem Augers		PAGE 1 OF 35

K.M.  
6-11-92

CB 7/1/92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 IN.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USF)	REMARKS
0.0	098232 1450 6-8-92	1	6	Medium stiff dark yellowish brown (10YR, 4/6) silty clay with organic matter, low plasticity, moist	CL	1.0	H <sub>nu</sub> = 1.5 ppm B <sub>r</sub> = 30 cpm α = 0 cpm
	098233 1450 6-8-92	3	4	Same As Above	CL	1.0	
	NA	5	0	No Recovery	N/A	N/A	
1.5	098234 1500 6-8-92	2	6	Very stiff light olive brown (2.5Y, 5/6) silty clay with sand and trace very fine gravel, a little organic matter, low plasticity, slightly moist	CL	2.0	H <sub>nu</sub> = 1.5 ppm B <sub>r</sub> = 30 cpm α = 0 cpm
	098235 1500 6-8-92	5	3	Stiff light olive brown (2.5Y, 5/4) silty clay with sand and a little fine gravel, trace organic matter, medium plasticity, moist	CL	1.75	
	NA	25	0	No Recovery	N/A	N/A	
3.0	098236 1515 6-8-92	13	6	Very stiff olive gray (5Y, 5/2) silty clay with a little sand and a little fine gravel, low plasticity, slightly moist	CL	2.0	H <sub>nu</sub> = 1.5 ppm B <sub>r</sub> = 30 cpm α = 0 cpm
	098237 1515 6-8-92	11	6	Same As Above	CL	2.0	
	098238 1515 6-8-92	13	6	Same As Above	CL	2.0	There is a concrete fragment in the top portion of the sample
4.5	098239 1600 6-8-92	13	6	Very stiff light olive brown (2.5Y, 5/4) silty clay with sand and a little fine gravel, non plastic, slightly moist	CL <sub>e</sub> AAE	2.75	H <sub>nu</sub> = 1.5 ppm B <sub>r</sub> = 30 cpm α = 0 cpm
	098240 1600 6-8-92	10	6	Very stiff grayish brown (2.5Y, 5/2) clayey silt with trace sand and gravel, a little very dark gray (5Y 3/1) mottling and strong brown (7.5YR, 4/6) staining, slightly moist	ML	2.75	
	NA	16	0	No Recovery	N/A	N/A	
	098241 1640 6-9-92	7	6	Stiff olive (5Y, 5/3) silty clay medium plasticity, moist	CL	1.5	H <sub>nu</sub> = 1.5 ppm B <sub>r</sub> = 30 cpm α = 0 cpm
	098242 1640 6-9-92	8	6	Very stiff light olive brown (2.5Y, 5/4) silty clay with sand and some light gray (2.5Y, 6/0) mottling, low plasticity, moist	CL	3.0	Water level = 6.28 Ft Below Ground surface
7.5	098243 1640 6-9-92	10	5	Stiff olive (5Y, 5/4) silty clay with a little gray (5Y, 5/1) mottling, medium plasticity, moist	CL	1.5	

NOTES:  
 Contractor: Pennsylvania Drilling  
 Rig: SIMCO Auger Rig  
 Driller: Dave Newman  
 Assistant Driller: Bob Johnson

Samples Collected Per ASTM Standard Penetration Test  
 Colors Identified using Munsell Color Chart  
 6-8-92  
 Background Levels: H<sub>nu</sub> = 1.5 ppm  
 B<sub>r</sub> = 30 cpm  
 α = 0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1843	COORDINATES:	DATE: 6-9-92
ELEVATION:	GWL: Depth 6.28 Date/Time 6-9-92/1300	DATE STARTED: 6-8-92
ENGINEER/GEOLOGIST: K. Marian	Depth Date/Time	DATE COMPLETED: 6-10-92 <small>K.A.</small>
DRILLING METHODS: Auger	PAGE 2	OF 85

DEPTH (Ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISF)	REMARKS
7.5	098244 1655 6-9-92	9	6	Stiff olive (5/3, 5/3) silty clay, medium plasticity, moist	CL	1.5	H <sub>nu</sub> = 2.5 ppm β <sub>γ</sub> = 50 cpm α = 0 cpm
8.5	098245 1655 6-9-92	11	6	Stiff olive (5/3, 5/3) silty clay with gray (5/1, 5/1) mottling, medium plasticity, moist	CL	2.0	The elevated H <sub>nu</sub> reading is probably due to moisture condensing on the bulb inside the H <sub>nu</sub> meter
	098248 0845 6-10-92	3	6	Stiff light olive brown (5/4, 5/4) silty clay with trace sand and gravel, a little gray (5/1, 6/1) mottling, medium plasticity, moist	CL	1.25	H <sub>nu</sub> = 0 ppm β <sub>γ</sub> = 50 cpm α = 0 cpm
10.0	098249 0845 6-10-92	5	6	Same As Above	CL	1.25	Note: A 3" split spoon <sup>spec</sup> was driven in order to collect Full HSL and Full RAD samples
	098249 0845 6-10-92	7	6	Same As Above	CL	1.25	
	098251 1000 6-10-92	6	6	Stiff light olive brown (2.5/4, 5/4) silty clay, medium plasticity, moist	CL	1.0	H <sub>nu</sub> = 0 ppm β <sub>γ</sub> = 50 cpm α = 0 cpm
11.5	098252 1000 6-10-92	12	6	Hard light olive brown (2.5/4, 5/6) silty clay with a little sand and fine gravel, a little (5/1, 6/1) mottling, non plastic, slightly moist	CL	>4.5	Note: A 3" split spoon was driven in order to collect Full HSL and Full RAD samples
	098252 1000 6-10-92	22	6	Same As Above	CL	>4.5	
13.0	098253 1100 6-10-92	15	6	Hard light olive brown (2.5/4, 5/6) silty clay with sand and a little gravel, non plastic, slightly moist	CL	>4.5	H <sub>nu</sub> = 0 ppm β <sub>γ</sub> = 50 cpm α = 0 cpm
	098254 1100 6-10-92	21	6	Same As Above	CL	>4.5	
	098255 1100 6-10-92	26	6	Same As Above	CL	>4.5	
14.5	098256 1115 6-10-92	21	6	Hard light olive brown (2.5/4, 5/4) silty clay with sand and a little gravel, non plastic, slightly moist	CL	4.5	H <sub>nu</sub> = 0 ppm β <sub>γ</sub> = 50 cpm α = 0 cpm
	098257 1115 6-10-92	23	6	Very stiff light olive brown (2.5/4, 5/4) silty clay with sand and a little gravel, low plasticity, slightly moist	CL	3.0	
14.5	098258 1115 6-10-92	26	6	Hard light olive brown (2.5/4, 5/4) silty clay with sand and a little gravel, non plastic, slightly moist	CL	>4.5	
Continued on next page							

NOTES

6-9-92 Background Levels: H<sub>nu</sub> = 1.5 ppm  
β<sub>γ</sub> = 50 cpm  
α = 0 cpm

6-10-92 Background Levels: H<sub>nu</sub> = 0 ppm  
β<sub>γ</sub> = 50 cpm  
α = 0 cpm

SEE PAGE 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1843	COORDINATES:	DATE: 6-10-92
ELEVATION:	GWL: Depth 6.28 Date/Time 6-19-92/300	DATE STARTED: 6-8-92
ENGINEER/GEOLOGIST: K. Maricci	Depth Date/Time	DATE COMPLETED: 6-10-92
DILLING METHODS: Auger	PAGE 3 OF 3508 7/6/92	

6-11-92  
12.m.

DEPTH ft.	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
14.5	098259 1335 6-10-92	5	6	Very stiff light olive brown (2.5Y, 5/4) silty clay with a little sand, some yellowish brown (10YR, 5/8) mottling	CL	3.0	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 50 cpm α = 0 cpm
	098260 1335 6-10-92	11	6	trace very dark gray (10YR, 3/1) staining non plastic, slightly moist As above but Hard clay	CL	4.5	
	098261 1335 6-10-92	16	6	Very stiff gray (5Y, 5/1) silty clay with a little sand, low plasticity, moist	CL	4.0	
16.0	098262 1355 6-10-92	15	6	Very stiff gray (5Y, 5/1) silty clay with a little sand and trace gravel, low plasticity, moist	CL	2.0	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 50 cpm α = 0 cpm
	098263 1355 6-10-92	18	6	Hard clay as above with strong brown mottling (7.5YR, 5/8), slightly moist	CL	4.5	
	098264 1355 6-10-92	21	6	Very stiff gray (5Y, 5/1) silty clay with a little sand and trace gravel, some strong brown (2.5YR, 5/8) mottling, low plasticity, slightly moist	CL	4.0	The end of the split spec is wet
17.5	098265 1430 6-10-92	18	6	Very stiff gray (5Y, 5/1) silty clay with sand and gravel, medium plasticity, moist	CL	2.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 50 cpm α = 0 cpm
	098266 1430 6-10-92	21	6	Very stiff gray (5Y, 5/1) silty clay with sand and gravel, medium plasticity, slightly moist	CL	2.5	
19.0	098267 1430 6-10-92	19	6	Same As Above	CL	2.5	
	098268 1445 6-10-92	18	6	Soft gray (5Y, 5/1) silty clay with sand and gravel, low plasticity, wet	CL	.5	H <sub>nu</sub> = 0 ppm B <sub>r</sub> = 50 cpm α = 0 cpm
	098269 1445 6-10-92	18	6	Soft gray (5Y, 5/1) silty clay with sand and gravel, low plasticity, moist	CL	2.0	
20.0				Bottom of Bore Hole 20.0ft			

NOTES

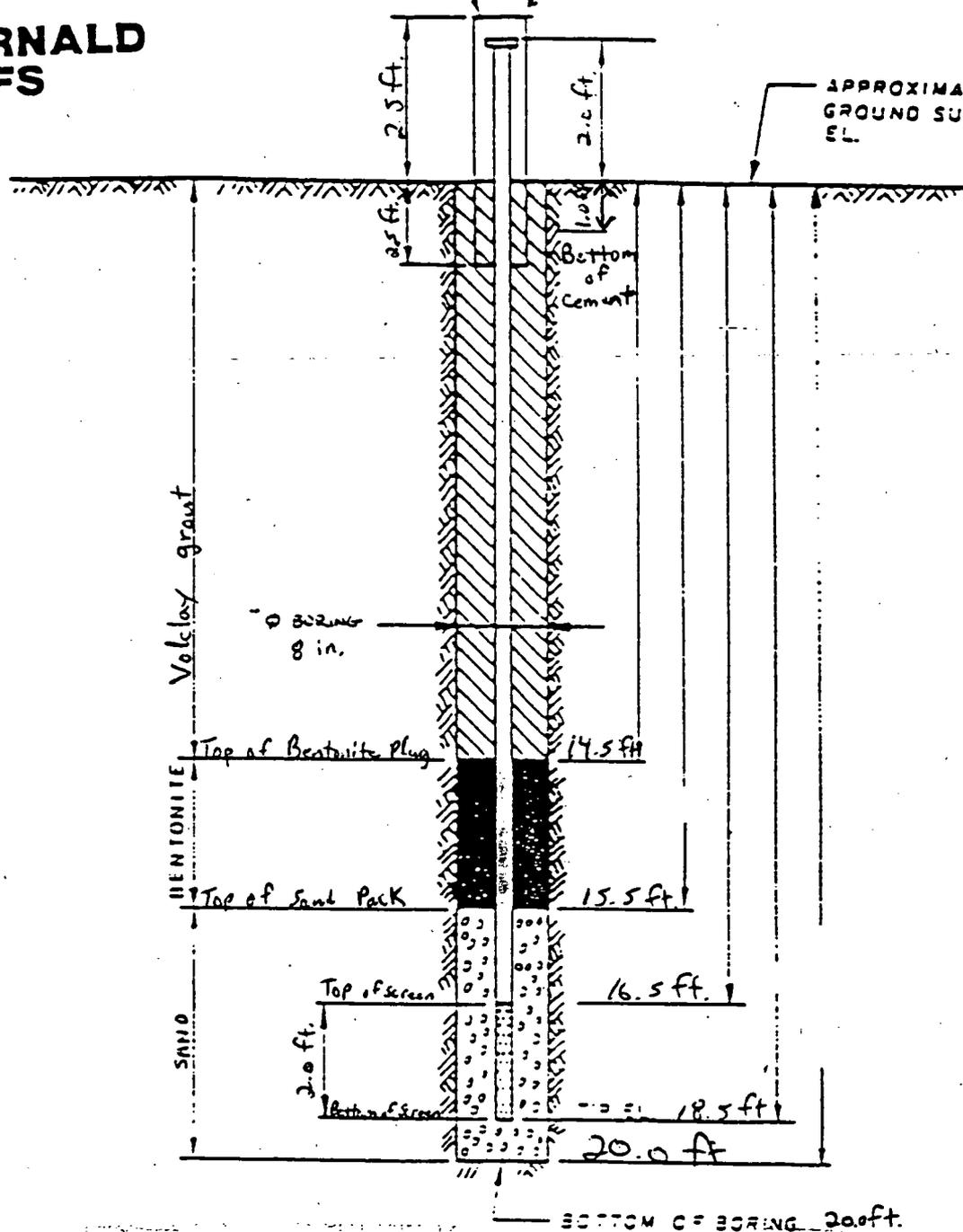
See p. 1 & 2

3532

# FERNALD RI/FS

PROTECTIVE RISER CASING Hinged cover with padlock

APPROXIMATE EXISTING GROUND SURFACE EL.



DRAWING NUMBER
CHECKED BY
APPROVED BY
K. M. Macchia
6-17-92
DRAWN BY

### NOTES:

1. RISER PIPE IS 2 IN ID SCHEDULE 40 PVC PIPE, THREADED, FLUS--JOINTED.
2. SCREEN IS 2 IN I.D PVC PIPE CONTINUOUS SLOT SCREEN (0.070 IN SLOT SIZE)
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL 6.28 FT.
5. WATER LEVEL READING ON 6-19-92

INSTALLATION DETAILS  
MONITORING WELL # 1843

PREPARED FOR

FEMP RI/FS

### Materials Used during Well Installation:

- 1- 80 lb bag of sand (10/20)
- 1 1/2- 5 gallon buckets of bentonite pellets
- 1 1/2- 50 lb. bags of velocity graut
- 1/2- 50 lb. bag of cement
- 38- gallons of water used during installation

Pipe Sections: 1- 2.0 ft. screen with endcap, 1- 10 ft., 1- 8.5 ft.

**PIEZOMETER INSTALLATION SHEET**

3532

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. Ken Marion DATE 6-19-92  
 PROJECT NO. 602.50.03-07 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BORING NO. 1843  
 PIEZOMETER NO. 1843 DATE OF INSTALLATION 6-11-92

**BOREHOLE DRILLING**

DRILLING METHOD <u>Hollow Stem Augers</u>	TYPE OF BIT <u>Bull Dog - Hollow Auger</u>
DRILLING FLUID(S) USED: FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	CASING SIZE(S) USED: SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring Well Piezometer</u> DIAMETER OF PERFORATED SECTION <u>2.0 in ID</u> PERFORATION TYPE: SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> $\frac{1}{4}$ " SCREEN <input type="checkbox"/> AVERAGE SIZE OF PERFORATIONS <u>0.070 in</u> TOTAL PERFORATED AREA <u>2.0 ft.</u>	RISER PIPE MATERIAL <u>PVC schedule 40</u> RISER PIPE DIAMETERS: O.D. <u>2 3/8 in. 2 5/16 in. 2.0 in</u> LENGTH OF PIPE SECTIONS <u>1-2 ft., 1-10 ft., 1-8.5 ft.</u> JOINING METHOD <u>Screw type-flush joint threaded</u>
--	--

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft.</u>	OTHER PROTECTION <u>hinged locking cover with padlock</u>
PROTECTIVE PIPE O.D. <u>4 3/8 in. 4 1/2 in.</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS: <u>CEMENT GROUT / SLURRY</u> R.M. 6-19-92	TOP 0.0	BOTTOM 1.0		
	TOP 1.0	BOTTOM 14.5	TCP	BOTTOM
	TOP 14.5	BOTTOM 15.5	TOP	BOTTOM
	TOP 15.5	BOTTOM 20.0	TOP	BOTTOM
SAND	TOP N/A	BOTTOM N/A	TOP	BOTTOM
GRAVEL	TOP N/A	BOTTOM N/A	TOP	BOTTOM
PERFORATED SECTION	TOP 16.5	BOTTOM 18.5	TOP	BOTTOM
PIEZOMETER TIP	18.5			
BOTTOM OF BOREHOLE	20.0			
GWL AFTER INSTALLATION	6.28			

AS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 AS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS \_\_\_\_\_

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1844	COORDINATES:	DATE: 6-2-92
ELEVATION:	GWL: Depth 6.46 ft, Date/Time 6-2-92/0410	DATE STARTED: 6-2-92
ENGINEER/GEOLOGIST: K. Marion	Depth	Date/Time
DRILLING METHODS: Auger 8" O.D. Hollow Stem Augers	DATE COMPLETED: 6-3-92	
		PAGE 1 OF 85

DEPTH ft.	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (11SF)	REMARKS
0	098202 1030 6-2-92	3	6	Medium dense Brown (10YR, 5/3) clayey silt with organic matter, slightly moist	ML	N/A	H <sub>nu</sub> = 0 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
	098203 1030 6-2-92	6	3	Same As Above	ML	N/A	α = 0 cpm = 098201 - T/F Blank
1.5	NA	10	0	No Recovery	N/A	N/A	
1.5 K.M. 6-3-92	098204 1045 6-2-92	3	6	stiff yellowish brown (10YR, 5/4) silty clay with a little organic matter, low plasticity, slightly moist	CL	1.5	H <sub>nu</sub> = 0 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
	098205 1045 6-2-92	5	4	stiff yellowish brown (10YR, 5/4) silty clay with a little organic matter, medium plasticity, slightly moist	CL	1.5	
	NA	8	0	No Recovery	N/A	N/A	
3.0	098206 1100 6-2-92	5	6	stiff yellowish brown (10YR, 5/4) silty clay with trace organic matter, low plasticity, slightly moist	CL	1.5	H <sub>nu</sub> = 0 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
	098207 1100 6-2-92	7	6	Very stiff light olive brown (2.5Y, 5/4) silty clay with a little sand and trace gravel, low plasticity, slightly moist	CL	2.5	
	098208 1100 6-2-92	11	2	Same As Above	CL	2.5	K.M. 6-16-92
4.5	098209 1415 6-2-92	12	6	Medium stiff dark yellowish brown (10YR, 4/4) silty clay with trace sand, medium plasticity, slightly moist	CL	0.75	H <sub>nu</sub> = 0 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
	098210 1415 6-2-92	13	6	Very stiff light olive brown (2.5Y, 5/4) silty clay with a little sand and trace gravel, low plasticity, slightly moist	CL	3.25	
5.5	098211 1440 6-2-92	13	6	Hard yellowish brown (10YR, 5/4) and light brownish grey (2.5Y, 6/2) mottled silty clay with sand and coarse gravel, non plastic, slightly moist	CL	>4.5	H <sub>nu</sub> = 0 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
6.46	098212 1440 6-2-92	28	6	Same As Above	CL	>4.5	water Level = 6.4 ft Below Ground surface Note: used 3 inch split spoon in order to collect Full HSL and Full RAO samples
7.5	098213 1440 6-2-92	36	6	Same As Above	CL	>4.5	

CB 7/1/92

**NOTES**

Contractor: Pennsylvania Drilling  
Rig: SIMCOE Auger rig  
Driller: Dave Newman  
Assistant Driller: Bob Johnson

Samples Collected per ASTM Standard Penetration Test  
Colors Identified using Munsell Color Chart

Background Levels: H<sub>nu</sub> = 0 ppm  
B<sub>σ</sub> = 60 cpm  
α = 0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.50.03.07	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1844	COORDINATES:	DATE: 6-2-92
ELEVATION:	GWL: Depth 6.40 Date/Time 6-8-92/0910	DATE STARTED: 6-2-92
ENGINEER/GEOLOGIST: K. Marion	Depth Date/Time	DATE COMPLETED: 6-3-92
DRIILLING METHODS: Auger	PAGE 2 OF 25	

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	098214 1525 6-2-92	35	6	Hard light olive brown (2.5 <sub>u</sub> , 5/4) and light brownish gray (2.5 <sub>u</sub> , 6/2) mottled silty clay with sand and a little gravel, trace dark brown (10 <sub>u</sub> , 2/3) staining, low plasticity, slightly moist	CL	>4.5	H <sub>nu</sub> = 0 ppm B <sub>u</sub> = 60 cpm α = 0 cpm
	098214 1525 6-2-92	42	6	Same As Above	CL	>4.5	
	098215 1525 6-2-92	43	6	Very stiff light olive brown (2.5 <sub>u</sub> , 5/4) and light brownish gray (2.5 <sub>u</sub> , 6/2) mottled silty clay with sand, low plasticity, slightly moist	CL	3.0	Note: used 3 inch spoon in order to collect volume required by Full HSL/Full R <sub>h</sub> sampling
9.0	098216 1555 6-2-92	10	6	Very stiff light olive brown (2.5 <sub>u</sub> , 5/4) silty clay with sand and fine gravel, low plasticity, slightly moist	CL	4.0	H <sub>nu</sub> = 0 ppm B <sub>u</sub> = 60 cpm α = 0 cpm
	098217 1555 6-2-92	16	6	Hard light olive brown (2.5 <sub>u</sub> , 5/4) silty clay with sand and fine gravel, low plasticity, slightly moist	CL	4.5	α = 0 cpm
	098218 1555 6-2-92	25	3	Same As Above	CL	4.5	
10.5	098219 1665 6-2-92	8	3	stiff light olive brown (2.5 <sub>u</sub> , 5/4) silty clay with sand and gravel, low plasticity, slightly moist	CL	2.0	H <sub>nu</sub> = 0 ppm B <sub>u</sub> = 60 cpm α = 0 cpm
	NA	13	0	No Recovery	N/A	N/A	
	NA	15	0	No Recovery	N/A	N/A	
12.0	098220 1620 6-2-92	15	6	Very stiff light olive brown (2.5 <sub>u</sub> , 5/4) silty clay with sand and gravel, low plasticity, slightly moist	CL	3.0	H <sub>nu</sub> = 0 ppm B <sub>u</sub> = 60 cpm α = 0 cpm
	098221 1620 6-2-92	16	6	Hard light olive brown (2.5 <sub>u</sub> , 5/4) silty clay with sand and gravel, low plasticity, slightly moist	CL	>4.5	
	098222 1620 6-2-92	21	6	Same As Above	CL	>4.5	
13.5	098223 1630 6-2-92	25	6	Very stiff light olive brown (2.5 <sub>u</sub> , 5/4) silty clay with sand and gravel, low plasticity, slightly moist	CL	3.5	H <sub>nu</sub> = 0 ppm B <sub>u</sub> = 60 cpm α = 0 cpm
	098224 1630 6-2-92	31	6	Very stiff gray (5 <sub>u</sub> , 5/1) silty clay with sand and gravel, low plasticity, slightly moist	CL	2.5	α = 0 cpm
15.0	098225 1630 6-2-92	31	6	Same As Above	CL	2.5	

NOTES

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VISUAL CLASSIFICATION OF SOILS

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BORING NUMBER: 18 44	COORDINATES:	DATE: 6-3-92
ELEVATION:	GWL: Depth 6.40 Date/Time 6-2-92/6910	DATE STARTED: 6-2-92
ENGINEER/GEOLOGIST: K. Marion	Depth Date/Time	DATE COMPLETED: 6-3-92
DRILLING METHODS: Auger	PAGE 3 OF 25	

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in. 1)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (115F)	REMARKS
15.0	098226 1100 6-3-92	5	6	Very soft light olive-brown (2.5% silt) SILTY CLAY, Medium plasticity, wet Medium dense olive brown (2.5% silt) well graded SAND, wet	CL SW	.25 N/A	H <sub>nu</sub> = .2 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
	098227 1100 6-3-92	16	6	Same As Above	SE	N/A	
	098228 1100 6-3-92	10	5	Same As Above	SE	N/A	
16.5	098229 1115 6-3-92	9	6	Very stiff gray (3% silt) SILTY CLAY with sand and a little gravel, medium plasticity, moist	CL	2.25	H <sub>nu</sub> = .2 ppm B <sub>σ</sub> = 60 cpm α = 0 cpm
	098230 1115 6-3-92	11	6	Same As Above	CL	2.25	
18.0	098231 1115 6-3-92	15	3	Same As Above	CL	2.25	
				Bottom of Borehole			

NOTES

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Background Levels: H<sub>nu</sub> = 0.2 ppm  
B<sub>σ</sub> = 60 cpm  
α = 0 cpm

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# FERNALD RI/FS

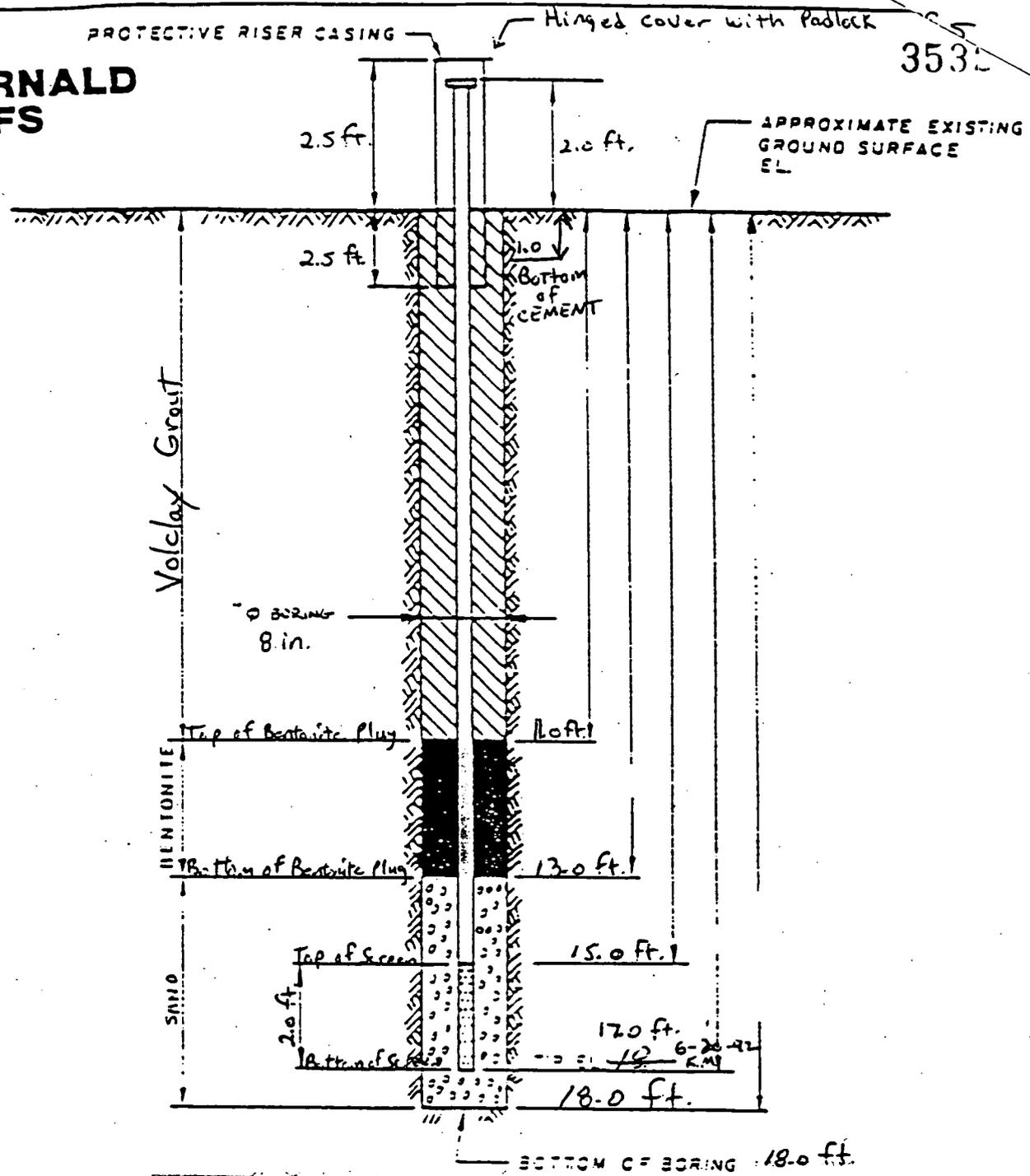
PROTECTIVE RISER CASING      Hinged cover with padlock

DRAWING NUMBER

CHECKED BY  
APPROVED BY

K. Mason  
6-20-92

DRAWN BY



**NOTES:**

1. RISER PIPE IS 2 IN 10 SCHEDULE 40 PVC PIPE, THREADED, FLUS-JOINTED.
2. SCREEN IS 2 IN 1.0 PVC PIPE CONTINUOUS SLOT SCREEN (0.020 IN SLOT SIZE)
3. LOWER END OF SCREEN IS CAPPED. *x.m. 6-15-92*
4. ELEVATION OF WATER LEVEL 6.40 ft
5. WATER LEVEL READING ON 6-8-92

INSTALLATION DETAILS  
MONITORING WELL #1844

PREPARED FOR  
FEMP RI/FS

Materials Used during Well Installation:

- 1 1/2 80 lb. bags of Sand (10/20)
- 1/2 5 gallon bucket of bentonite pellets
- 1 1/2 50 lb. bags of Volclay grout
- 1/2 50 lb. bag of cement
- 38 gallons of water used during installation

Pipe Sections: 1-2 ft. Screen, 1-10 ft riser, 1-7 ft. riser

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. K. Marien DATE 6-20-92  
 PROJECT NO. 602-50-03 07 CHECKED BY C. Bruce DATE 7/1/92  
 BORING NO. 1842 1844  
 PIEZOMETER NO. 1844 DATE OF INSTALLATION 6-3-92

**BOREHOLE DRILLING**

DRILLING METHOD <u>Hollow Stem Auger</u>	TYPE OF BIT <u>Bull Dog</u>
DRILLING FLUID(S) USED: FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	CASING SIZE(S) USED: SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring Piezometer</u>	RISER PIPE MATERIAL <u>PVC schedule 40</u>
DIAMETER OF PERFORATED SECTION <u>2.0 in. ID</u>	RISER PIPE DIAMETERS: <u>K.M. 6-22-92</u> O.D. <u>2 3/8 in. 2 5/16</u> I.D. <u>2.0 in.</u>
PERFORATION TYPE: SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>2 ft., 1-10 ft., 1-7 ft.</u>
AVERAGE SIZE OF PERFORATIONS <u>0.020 in. K.M. 6-22-92</u>	JOINING METHOD <u>Screw type - Flush joint threaded</u>
TOTAL PERFORATED AREA <u>2.0 ft.</u>	

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft.</u>	OTHER PROTECTION <u>hinged locking cover with padlock</u>
PROTECTIVE PIPE O.D. <u>4 3/8 in. 4 1/2 in. K.M. 6-22-92</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS: <u>CEMENT GROUT SLURRY K.M. 6-20-92</u>	TOP 0.0	BOTTOM 1.0		
	TOP 1.0	BOTTOM 11.0	TCP	BOTTOM
	TOP 11.0	BOTTOM 13.0	TOP	BOTTOM
	TOP 13.0	BOTTOM 18.0	TOP	BOTTOM
BENTONITE	TOP 11.0	BOTTOM 13.0	TOP	BOTTOM
SAND	TOP 13.0	BOTTOM 18.0	TOP	BOTTOM
GRAVEL	TOP N/A	BOTTOM N/A	TOP	BOTTOM
PERFORATED SECTION	TOP 15.0	BOTTOM 17.0	TOP	BOTTOM
PIEZOMETER TIP	17.0			
BOTTOM OF BOREHOLE	18.0			
GWL AFTER INSTALLATION	6.40			

AS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 AS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS \_\_\_\_\_