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CONSOLIDATED CONSENT AGREEMENT/ FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT PERIOD ENDING JANUARY 31, 1992

01/31/92

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ENCLOSURE

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

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Period Ending January 31, 1992

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 January 1 through January 31, 1992 and planned actions for the period February 1 through February 29, 1992.

Highlights of activities in January include the following:

- The dust collector was removed from the Silo 3 dome on January 8, 1992, seven days ahead of schedule.
- The Work Plan for RA No. 13, Plant 1 Ore Silos, was submitted to the U.S. EPA on January 9, 1992, one day ahead of schedule.
- A Request for Proposal (RFP) was issued to the Construction Contractor on January 10, 1992 for the pre-purchasing of the High Density Polyethylene (HDPE) piping and fittings (long-term material) for RA No. 3, South Groundwater Contamination Plume, Part 2.
- New Proposed Phase II Removal Actions, a date for the revisions to the Low-Level Waste/Thorium Management and Safe Shutdown Programs, and a schedule for a Removal Action Work Plan for RA No. 19, Plant 7 Dismantling, were submitted to the U.S. EPA for review and approval on January 15, 1992.
- A schedule for providing an update to the deliverable submitted pursuant to the compilation of existing site documentation supporting the ongoing low-level waste and thorium management programs was submitted, on time, to the U.S. EPA on January 15, 1992.
- A schedule for providing an update to the deliverable submitted pursuant to the compilation of existing site documentation supporting the ongoing Safe Shutdown programs was submitted, on time, to the U.S. EPA on January 15, 1992.

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Introduction (cont'd.)

- The Construction Package 2A, main pipeline package for RA No. 3, South Groundwater Contamination Plume, Part 2, was prepared and a CFC Package was issued on January 17, 1992.

- Phase 1, the implementation of the run-off/off control measures of the Plant 1 Pad Continuing Release Removal Action, was completed on January 17, 1992, ahead of the scheduled due date of March 13, 1992.

- The Design Risk Assessment Report (RAR) for RA No. 3, South Groundwater Contamination Plume, Part 1, was issued on January 20, 1992.

- The Request for Construction Action (RCA) for 2A (main discharge pipeline) for RA No. 3, South Groundwater Contamination Plume, Part 2, was issued to the Construction Contractor on January 20, 1992.

- The formal comment/response document and EWMF SAP (Final, Revision 1) were submitted to the U.S. EPA on January 21, 1992.

- Comment responses on the Operable Unit 5 Miscellaneous Additional Wells Program Work Plan Addendum were transmitted to the U.S. EPA and the Ohio EPA on January 22, 1992.

- The Work Plan for RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator, was submitted to the U.S. EPA on January 23, 1992, on schedule.

- The IAWWT (SWRB) utilities package construction project for RA No. 3, South Groundwater Contamination Plume, Part 3, was awarded by the Construction Contractor on January 24, 1992 to IND-COM Builders.

- The Bentonite Monitoring Plan for RA No. 4, Silos 1 and 2, was submitted to the U.S. EPA on January 27, 1992, on schedule.

- A Silos 1 and 2 Removal Action Bentonite Effectiveness Monitoring Plan that describes the methodolody 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 28, 1992.

Introduction (cont'd.)

- Initial sampling of Pit 5 for the Pits 5, 6, and Clearwell Sampling Program of Operable Unit 1 was completed on January 29, 1992.

- Comment responses and a revised Stabilization/Chemical Extraction Treatability Study Work Plan for Operable Unit 4 were submitted to the U.S. EPA and the Ohio EPA on January 3, 1992. The revised Operable Unit Stabilization/Chemical Extraction Treatability Study Work Plan was approved by the Ohio EPA on January 29, 1992.

- A revised Operable Unit 4 Treatability Study Work Plan for the Vitrification of Residues from Silos 1, 2, and 3 was submitted to the U.S. EPA and the Ohio EPA on January 29, 1992.

- The Work Plan for RA No. 15, Scrap Metal Piles, was submitted to the U.S. EPA on January 31, 1992, on schedule.

- The Permit-to-Install (PTI) for RA No. 3, South Groundwater Contamination Plume, Part 1, was transmitted to the Ohio EPA on January 31, 1992. The test well report was not ready for submittal but will be transmitted as a follow-up package in February 1992.

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

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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.
- o Enclosure D - Drilling/Boring Logs.

CA Section IX. Removal Actions

This section provides an update of activities associated with the implementation of Removal Actions (RAs) at the FEMP during January 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.

CA Section IX. Removal Actions (cont'd.)

Phase II Removal Actions

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

Phase III Removal Actions

- RA No. 19, Plant 7 Dismantling.
- RA No. 20, Stabilization of UNH Inventories.
- RA No. 21, Expedited Silo 3.

Proposed Phase III Removal Actions

- RA No. 22, Waste Pit Area Containment Improvement.
- RA No. 23, Inactive Flyash Pile.
- RA No. 24, Pilot Plant Sump.
- RA No. 25, Nitric Acid Tank Car and Area.

CA Section IX. Removal Actions (cont'd.)

Proposed Phase III Removal Actions

- RA No. 26, Asbestos Removals (Asbestos Program).
- RA No. 27, Management of Contained Structures at the FEMP.

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 January 1992, approximately 18,100 gallons of perched groundwater have been collected and transported for treatment by 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 January 1992, approximately 37,400 gallons of perched water have been collected for treatment from Plant 2/3 and approximately 22,600 gallons of perched water have been collected for treatment from Plant 8.

Plant 9 - Pumping from Plant 9 began on August 20, 1991 in accordance with the U.S. EPA and U.S. DOE milestone. Approximately 10,500 gallons of Plant 9 perched water have been extracted and collected through January 1992.

Plant 8 - The startup date for the Plant 8 treatment system was July 24, 1991. Through January 1992, approximately 86,300 gallons of groundwater have been transported and treated utilizing the Plant 8 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.

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 and conditional approval was received from the Ohio EPA on April 2, 1991.

Field studies showed permeability factors as high as 1×10^{-3} cm/sec in the north and east detention areas. As a result of these field studies, modifications in the form of a soil liner have been made to the design for these detention areas.

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

RA No. 2, Waste Pit Area Runoff Control (cont'd.)

The pre-excavation soil sampling and the subsequent reevaluation of the goals and objectives of the Sampling and Analysis Plan with respect to Hazardous Substance List (HSL) materials has resulted in a revision of the criteria for identifying the need for more samples, the disposition of excess construction soil, and the technical requirements for stockpiling the excavated soil, such as synthetic liners below and on top of the soil piles. The reevaluation of the results and the plan are to ensure that the criteria developed in the plan are adequate and appropriate for addressing each objective stated. Difficulties with site-wide issues related to the disposition of soils and debris necessitated the revision of the Sampling and Analysis Plan in terms of intermediate soil stockpiles along with a management plan for characterizing the excess material within 90 days of excavation. The revised plan was submitted to the U.S. EPA and the Ohio EPA for review and comment in October 1991. The revised Sampling and Analysis Plan includes the final determination for the disposition of excavated soil and the basis for the decision.

Activities in January 1992 included the initiation of construction of the sump and sampling to meet build over criteria at the bottom of the sump. Planned activities for February 1992 are to continue the construction of the sump base, sump walls, and complete the installation of the 12 inch force main.

KEY MILESTONES	STATUS	DUE DATE
Initiation of Bid/Award construction activities with issuance of the construction work order.	Completed. June 6, 1991.	June 1991
Completion of construction/ system testing (system operational).	Open, ahead of schedule.	July 1992

RA No. 3, South Groundwater Contamination Plume

Part 1

The Work Plan for Part 1, Alternate Water Supply for two industrial users, of the South Plume Removal Action was approved by the U.S. EPA on January 3, 1991. A summary of the most recent and ongoing activities for Part 1 are listed below:

- Work Plan (Revision 1) was issued December 31, 1991, including a revised Pre-excavation Field Screening and Soil Sampling and Analysis Plan.

RA No. 3, South Groundwater Contamination Plume (cont'd.)

Part 1 (cont'd.)

- The U.S. EPA and the Ohio EPA conditionally approved revision of the Part 1 Work Plan. Comments received concerned the revised Soil Sampling and Analysis Plan. The comments are being addressed.

- Preliminary discussions were held with the U.S. EPA and the Ohio EPA concerning the possibility of deleting the "Delta Steel" portion of the project. Verbal concurrence was received for the DOE to proceed with a formal written request for the proposal.

- The Design Risk Assessment Report (RAR) for Part 1 was issued on January 20, 1992. The RAR will be converted into the new FEMP site format, and a Design Risk Management Plan will be developed prior to the contract award date.

- The final draft test well report was received in late January. Following internal review, it was determined that the report required several modifications before it could be issued. These modifications are expected to delay issuance of the report until the first week in February.

- The Permit-to-Install (PTI) was transmitted to the Ohio EPA on January 31, 1992. The test well report, which is a part of the required PTI package, was not ready for submittal and will be transmitted as a followup package in February 1992.

- Access agreements with property owners are progressing, with one property owner refusing access thus far. The Corps of Engineers (COE) has prepared documentation to begin acquisition by condemnation proceedings. These proceedings will begin on February 19, 1992 with acquisition projected to be completed by the end of May 1992.

Part 2

The initial computer modeling required to relocate the Part 2 well field was completed in July 1991. A meeting was held with the U.S. EPA and the Ohio EPA on July 23, 1991 to discuss the results of the modeling. Draft findings were presented. High levels of uranium were predicted by the model to be discharged from the relocated well field. This prediction raised concerns that the equivalent mass resolution will be difficult to meet with the currently scheduled Interim Advanced Wastewater Treatment (IAWWT) project. All parties agreed that the well field be installed north of Albright and Wilson Americas, Inc., but the issue of equivalent mass would need to be addressed in Part 3.

RA No. 3, South Groundwater Contamination Plume (cont'd.)

Part 2 (cont'd.)

Accordingly, an addendum to the Engineering Evaluation/Cost Analysis (EE/CA) was prepared which defined a restructuring concept which addressed all of the aforementioned changes and concerns. The addendum was issued to the U.S. EPA and the Ohio EPA for review and comment. Comments were received from the Ohio EPA on September 25, 1991. Comments from the U.S. EPA were received on October 18, 1991. Revisions to the addendum were made to reflect the comments received. The addendum was issued to the U.S. EPA and the Ohio EPA for a second review. Approval was received from the U.S. EPA and the Ohio EPA. The addendum was entitled "The Discussion of Significant Differences Report" and was placed in the Administrative (AR) for public review and comment.

To expedite the Part 2 construction, the project was divided into four construction bid packages. These included: 2A - Groundwater discharge pipeline (pressure flow) and outfall pipeline (gravity flow) from south of Willey Road to and including Manhole 182B, 2B - Manhole 182B to Great Miami River, 2C - Recovery well field, and 2D - Test well installation and pump test. Part 2 follow-on activities include:

- Revised Level IV schedules were developed to reflect the new construction phasing scheme for Construction Packages 2A through 2D.
- The Construction Package 2A main pipeline package was prepared and issued for internal review. Comments received were addressed, and a CFC Package was issued on January 17, 1992.
- The Request for Construction Action (RCA) for 2A (main discharge pipeline) was issued to the Construction Contractor on January 20, 1992.
- A Request for Proposal (RFP) was issued to the Construction Contractor on January 10, 1992 for the pre-purchasing of the High Density Polyethylene (HDPE) piping and fittings.
- The Construction Contractor issued the RFP for the South Groundwater Contamination Plume, Part 2 on January 28, 1992 for the pre-purchase of HDPE piping and fittings (long-lead material).

RA No. 3, South Groundwater Contamination Plume (cont'd.)

Part 2 (cont'd.)

- A revised Part 2 and Part 3 Work Plan was prepared to reflect the changes which were explained in the "Explanation of Significant Differences Document." The document also was expanded to better describe the installation of additional pumping capacity at the Storm Water Retention Basin to help minimize overflows. The draft Revised Part 2 and Part 3 Work Plan, including responses to comments, was issued for internal review on January 20, 1992. Comments were incorporated. A revised draft was issued for internal review and comments received were incorporated. A revised Parts 2/3 Work Plan will be issued to the U.S. EPA and the Ohio EPA in early February.

- The Operation and Maintenance (O&M) Plan for the Part 2 well field was prepared and issued for review to the U.S. EPA and the Ohio EPA on November 1, 1991. Comments were addressed and issued to the U.S. EPA and the Ohio EPA.

- DOE - Oak Ridge has been sent documentation to initiate property access/acquisition by the COE. Negotiations will take place with property owners during the next two to three months. Two property owners are expected to refuse access and, therefore, acquisition by condemnation proceedings are anticipated. Acquisition of these properties is expected to be completed by mid-August 1992, or earlier.

Part 3

The Work Plan for Part 3 (the installation and operation of an Interim Advanced Wastewater Treatment [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 as described above. 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 1700 pound per year agreement. The IAWWT system will include two treatment units. The IAWWT unit located at the Storm Water Retention Basin (SWRB) will have a nominal 300 gpm capacity and the unit located at the Biodenitrification Treatment/Effluent Treatment System (IAWWT[BDN-ETS]) will have a nominal capacity of 100 gpm.

RA No. 3, South Groundwater Contamination Plume (cont'd.)

Part 3 (cont'd.)

The IAWWT (SWRB) will be handled as a two-part design: the trailer package, which includes the treatment system; and the utilities services package, which includes all utilities and support systems. Activities during the period include the following:

- Bids for the Utilities Services Design Package for the IAWWT(SWRB) system were received by the Construction Contractor on January 16, 1992.
- The Construction Work Order for the Utilities Services design on the IAWWT(SWRB) was approved by the Operating Contractor on January 23, 1992.
- The IAWWT(SWRB) utilities package construction project was awarded by the Construction Contractor on January 24, 1992 to IND-COM Builders.
- The Operating Contractor held a design review kickoff meeting on January 14, 1992 for the nominal 100 gpm IAWWT(BDN-ETS) unit.
- Design comments on the drawings and specifications for the IAWWT(BDN-ETS) were received on January 24, 1992. Comments are being incorporated.
- The Operating Contractor completed internal reviews of both the Safety Assessment (SA) and Risk Assessment (RA) documentation for the IAWWT(SWRB). Final document approval is scheduled for the SA on February 12, 1992 and interim approval of the RA on February 15, 1992. Final approval of the RA is scheduled for March 1, 1992.

Part 4

Part 4 of the South Groundwater Contamination Plume Removal Action Work Plan involves groundwater monitoring and institutional controls. A follow-up round of sampling of property owner drinking water wells along Ohio State Route 128 where previous above-background levels of uranium have been detected was completed during January 1992. This sampling is now on a quarterly basis except for the three wells (homeowners) receiving bottled drinking water. Those wells are sampled monthly. Sampling of other RI/FS wells continued.

RA No. 3, South Groundwater Contamination Plume (cont'd.)

Part 5

A Part 5 was added to the South Plume in order to address the relocation of the Part 2 well field. The Part 5 will perform geochemical investigation of the area south of the well field to determine if 20 mg/l uranium in groundwater concentration is present downgradient of the well field.

In accordance with the agreement reached at the July 23, 1991 meeting between the DOE, the U.S. EPA, and the Ohio EPA, the scope of the Part 5 field investigation was expanded to include investigation of the area north and inclusive of the relocated Part 2 extraction well field. A revised Part 5 Work Plan was resubmitted to the U.S. EPA and the Ohio EPA. The U.S. EPA approved the Part 5 Work Plan. The Ohio EPA conditionally approved the Part 5 Work Plan with comments. Explanation of Significant Differences (ESD) document was included in the AR as discussed previously.

Activities during the period include the following:

- Responses to comments on the conditionally approved Part 5 Work Plan have been prepared and will be submitted with the hydropunch procedure to the U.S. EPA by February 5, 1992.

- Access to all properties has been obtained for the area where hydropunching will be performed.

Summary

The need to perform a pump test on the extraction well field was reevaluated. It was decided that a pump test would be performed to confirm the well field design prior to the purchase of the extraction pumps. This effort was integrated into the Level IV schedules for this project.

Work in February 1992 will focus on the following activities:

- Implementation of the Part 1 Sampling and Analysis Plan, as described in the first revision to the Work Plan dated December 31, 1991, was initiated late in January and is scheduled to be completed by mid-February 1992. The sampling and analysis activity (field work) is being performed by the Operating Contractor.

RA No. 3, South Groundwater Contamination Plume (cont'd.)

Summary (cont'd.)

- Certified for Construction (CFC) documents (revision 1) will be issued February 6, 1992. Documents include the A/E's design tie-in revisions and the deletion of the Delta Steel scope of work.
- The Invitation for Bid (IFB) package is forecasted to be issued by February 7, 1992. The issuance of the package has been delayed because of the revisions to the design package.
- The Part 2A Package is expected to be issued by February 14, 1992.

KEY MILESTONES	STATUS	DUE DATE
Complete Part 1 (Alternate Water Supply).	Open, on schedule.	July 14, 1992.
Complete Part 2 (Extraction wells, force main, effluent pipeline).	Open, on schedule.	January 29, 1993
Complete Part 3 (Interim Treatment Systems).	Open, on schedule.	July 30, 1992
Complete Part 4 (institutional control and monitoring).	Open, on schedule.	Ongoing
Complete Part 5 (groundwater modeling and geochemical investigation).	Open (ASI/IT issued new CCB package on Package 1).	Ongoing

RA No. 4, Silos 1 and 2

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

A Silos 1 and 2 Removal Action Bentonite Effectiveness 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 28, 1992. Also in January, field activities were initiated on the installation of the data logging system.

Work in February 1992 will center on the initial collection of radon data to be submitted as part of the Consent Agreement Monthly Report (see Enclosure C). These data will be used to document the required steps in monitoring the effectiveness of the installed bentonite as compared to the established goal of no greater than .015 pCi/l above background at the location of the maximally exposed individual at a non-FEMP location. Work in February 1992 will also include installation of the data logging system. The data logging system will automatically record data for the following: 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.

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

KEY MILESTONES	STATUS	DUE DATE
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

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, HSL volatile organics, HSL semi-volatile organics, and HSL pesticide organics and inorganics were received for the three samples of the decant liquid taken during the implementation of the Removal Action. Once the analytical results of the full radiological analyses for the three samples of the decant liquid are received, the treatment option will be determined.

The liquid pumped from the K-65 decant sump tank is being stored in the Plant 2/3 holding tanks until the analytical results are available and determination of the treatment required for the decant sump liquid is made.

Work in February 1992 will center on preliminary determination of the required treatment based on the available analytical results.

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

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 involves the placement of air monitors to augment the site requirements for estimating the off-site releases of potentially harmful contaminants. The monitors have been procured. Installation is expected in early CY1992. The final Waste Pit 6 Exposed Material Removal Action Final Report was completed and is being reviewed internally. It is forecasted to be issued in February.

RA No. 7, Plant 1 Pad Continuing Release

The removal action consists of three phases. Phase I implements the run-on/off control measures. 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.

RA No. 7, Plant 1 Pad Continuing Release (cont'd.)

Activities in January included the procurement and installation of materials for the Phase II work. Installation of Phase I run-on/off control measures was completed. Planning for the post-excavation sampling of the Phase II area continued.

Activities in February will include the continued installation of the underground utilities by the construction contractor. Planning for the post excavation sampling of the Phase II area will continue.

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

RA No. 8, Inactive Flyash Pile Control

A survey of two locations cited in the Weston Characterization Investigation Study (CIS) as containing elevated levels of uranium surface contamination was completed. Field screening instruments were used to evaluate these locations. The earlier results were confirmed for one of these areas. During the evaluation, another area of relatively high levels of contamination was identified. The two areas are within the perimeter chain barrier and have been isolated and posted with additional radiological warning signs. A rope is being attached to the top of the posts which support the perimeter chain barrier, and controlled area signs will be fastened to the rope as additional controls.

Planning is underway to further characterize surface contamination at the Inactive Flyash Pile and South Field area and to determine if any further action regarding the two areas is warranted.

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RA No. 9, Removal of Waste Inventories

During January 1992, 10,352 DEs of low-level waste (LLW) were dispositioned. The January goal of 8,185 DEs was exceeded by 2,167 DEs or 26%. The FY 1992 cumulative total LLW shipped is 30,143 DEs.

KEY MILESTONES	STATUS	DUE DATE
Provide a schedule for providing an update to the deliverable submitted pursuant to the compilation of existing site documentation supporting the ongoing low-level waste and thorium management programs by January 15, 1992.	Completed.	January 15, 1992
Update existing internal procedures to ensure that appropriate shipping documentation is entered into the administrative record file.	To be updated annually.	June 30, 1992 (commitment not approved by the U.S. EPA)

Two issues that have the potential of impacting the LLW shipment schedule are the availability of large open top containers for packaging waste and hazardous waste determinations. Delivery of 10 large open top containers is expected to start the second week of February with a delivery rate of 10 boxes per week. A team of material control, quality, evaluation, and environmental sampling personnel has been assembled to address the more than 30,000 DEs of containerized construction waste lacking hazardous waste determinations. A report is due February 11, 1992 to recommend a course of action.

Projected activities for February include the following:

- Ship 7,711 DEs of LLW.
- The Operating Contractor will submit the revised "FEMP Waste Application to Ship Waste to the Nevada Test Site," February 29, 1992, as a result of the 1991 DOE Nevada (NV) Audit. Along with the application revision, comment resolution regarding outstanding low level thorium waste will be delivered to DOE NV.

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RA No. 10, Active Flyash Pile Controls

Development of the Work Plan continued throughout January and is expected to continue throughout February.

KEY MILESTONES	STATUS	DUE DATE
Submit Active Flyash Pile Work Plan to the U.S. EPA for approval.	Open, on schedule.	March 2, 1992

RA No. 11, Pit 5 Experimental Treatment Facility

Removal Action No. 11 is in the construction phase. Work is proceeding on schedule. The Experimental Treatment Facility (ETF) site has been cleared of vegetation in preparation for liner installation. The liner will act as a barrier to the surrounding environment and will limit the potential spread of contamination caused by water run-off or accidental spillage of waste or construction materials. The construction of the pipe berm, which surrounds the ETF structure and will control rainwater run-on/run-off, has been completed. The installation of the Herculite liner, which will complete the system, is 90% complete.

Planned activities for February 1992 include the following:

- Completion of Liner installation.
- Removal, containerization, and on-site storage of ETF contents.
- Sampling of containerized waste material.
- Sampling of soil from beneath the ETF structure.

KEY MILESTONES	STATUS	DUE DATE
Complete removal action within 120 days of Work Plan approval.	Open. Work proceeding on schedule.	April 10, 1992 (based on Work Plan approval date of December 12, 1991)

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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 disposition the removed materials off-site.

KEY MILESTONES	STATUS	DUE DATE
Removal Action Memorandum Safe Shutdown Activities.	Completed. December 13, 1991	December 15, 1991
Provide a schedule for providing an update to the deliverable submitted pursuant to the compilation of existing site documentation supporting the ongoing Safe Shutdown programs by January 15, 1992.	Completed.	January 15, 1992.
Update existing internal procedures to ensure that appropriate documentation is entered into the administrative record file.	To be updated annually.	June 30, 1992 (commitment not approved by the U.S. EPA)

The initial Safety Assessment began in January and is forecasted for completion in February. The Safety Assessment will require that a hazard survey be conducted for each plant within the former process area.

The Training Plan for Safe Shutdown operations was approved, and the lesson plans for the core training requirements have been started.

Inventorying of Building 51 continued. A total of 1,877 expense items have been inventoried to date. The preliminary assessments for Plants 4 and 8 have been completed.

Estimates were prepared on the scope of work to remove 70 items of clean excess equipment (derby breakout and slag milling systems) and to transfer those items to the Department of the Army.

RA No. 12, Safe Shutdown (cont'd.)

Projected activities for February include the following:

- Complete the initial Safety Assessment.
- Issue a Task Order to the A/E to conduct the hazard survey for each process area, along with a schedule for completion.
- Finalize the lesson plan requirements.
- Continue the expense item inventory for Building 51 and the preparations within the building for equipment removal.
- Continue the Preliminary Assessments for each major process area.
- Continue the capital equipment disposition effort.
- Meet with representatives of the Department of the Army to finalize plans for transfer of selected pieces of capital equipment. Identify and initiate necessary transfer documents.
- Identify disposition of the ~210,000 pounds of graphite offered for bid in the Commerce Business Daily in January 1992.

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.

January activities included completion of the Removal Action Work Plan. The Removal Action Work Plan was submitted to the U.S. EPA on January 9, 1992.

RA No. 13, Plant 1 Ore Silos (cont'd.)

February activities will include continued design preparation, receipt of U.S. EPA comments on the Work Plan, and resolution of Work Plan comments.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA.	Completed. January 9, 1992	January 10, 1992
Receive U.S. EPA comments on the Work Plan.	Open.	February 9, 1992

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.

January activities included completion of the Removal Action Work Plan and planning for the implementation of the characterization portion of the removal action. Continued preparation for the implementation of the Removal Action, along with the receipt of U.S. EPA comments on the Work Plan and Work Plan comment resolution, is planned for February 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA.	Completed. January 23, 1992	January 23, 1992
Receive U.S. EPA comments on the Work Plan.	Open.	February 23, 1992

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RA No. 15, Scrap Metal Piles

The Scrap Metal Piles Removal Action will detail the stabilization and disposition of low-level radioactive waste scrap metal currently stockpiled on-site. This removal action will eliminate the potential threat of additional material releases to the environment due to wind, rain, or vehicular traffic. Approximately 1300 tons of scrap copper along with approximately 3,000 tons of recoverable scrap metals are the focus of this Removal Action.

January activities included the completion of the Work Plan. Continued preparation for implementation of the Removal Action Work Plan is planned for February 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA.	Completed. January 31, 1992	January 31, 1992
Receive U.S. EPA comments on the Work Plan.	Open.	March 1, 1992

RA No. 16, Collect Uncontrolled Production Area Runoff -- Northeast

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

KEY MILESTONES	STATUS	DUE DATE
Submit work plan to the U.S. EPA.	Open, on schedule.	March 2, 1992

RA No. 17, Improved Storage of Soil and Debris

This removal action will include the management and appropriate storage for low-level radioactive waste soil and debris on-site. 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.

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RA No. 17, Improved Storage of Soil and Debris (cont'd.)

January activities included continued Removal Action Work Plan preparation. Continuation of the preparation of the Removal Action Work Plan is planned for February 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA.	Open, on schedule.	March 25, 1992

RA No. 18, Control Exposed Material in Pit 5

The Control Exposed Material in Pit 5 Removal Action will be developed and implemented using a phased approach. The phased approach for Waste Pit 5 will consider and utilize information obtained from the liner repair activities presently in progress, 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.

Activities in January 1992 included development of the RSE, continuation of the berm investigation, which involves geotechnical sampling and analysis, and the evaluation of alternatives to address fugitive dust emissions from Pit 5. Work Plan develoment will continue in February 1992.

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

RA No. 19, Plant 7 Dismantling

The Plant 7 Dismantling Removal Action will include decontamination and dismantling of the Plant 7 above-ground 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.

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RA No. 19, Plant 7 Dismantling (cont'd.)

February activities will include initiation of work for preparation of the Characterization Plan for the Removal Action.

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

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 Removal Action #12, Safe Shutdown, but is being accelerated as a separate expedited response.

January's activities centered on a continuation of the System Integrity Testing. System Integrity Testing is being conducted to verify the integrity of selected piping systems to be used during the UNH processing. The testing will identify any system boundary leaks to areas of the process that are not required for the UNH operations, as well as leakage from system joints, mechanical connections, and equipment deficiencies. A failure of the normal Plant 8 Sump operational equipment has impacted the availability of existing filtration equipment required for processing the UNH. Repair actions are underway. This equipment is critical to the material processing operations and due to the uncertainties regarding the extent of required equipment repairs, schedule projections for the actual UNH processing cannot be performed with reasonable accuracy.

KEY MILESTONES	STATUS	DUE DATE
Begin System Integrity Testing.	Ongoing, started on schedule.	December 6, 1991
Submit Flow Charts to the U.S. EPA.	Open, on schedule.	February 28, 1992
Commence Processing Material.	Open.	Schedule being developed.
Finish Processing Material.	Open.	Schedule being developed.

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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 will mitigate the potential release of material to the environment and will include the following actions:

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

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 dust collector on Silo 3 dome.	Completed. January 8, 1992.	January 15, 1992

Work in February will center on disposition the equipment removed from Silo 3.

Proposed Phase III Removal Actions

RA No. 22, Waste Pit Area Containment Improvement

RA No. 23, Inactive Flyash Pile

RA No. 24, Pilot Plant Sump

RA No. 25, Nitric Acid Tank Car and Area

RA No. 26, Asbestos Removals (Asbestos Program)

RA No. 27, Management of Containment Structures at the FEMP

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CA Section X. Remedial Investigation and Feasibility Study (RI/FS)

This section provides an update on RI/FS Operable Units (OUs), RI/FS Community Relations, and Site Characterization for January 1992. Status information is presented for each of the six Operable Units identified in the Consent Agreement As Amended. The six Operable Units are described below:

- Operable Unit 1 (OU 1): Waste Pit Area. Waste pits 1-6, clearwell, burnpit, berms, liners and soil within the operable unit boundary.
- Operable Unit 2 (OU 2): Other Waste Units. Flyash piles, other south field disposal areas, lime sludge ponds, solid waste landfill, berms, liners, and soil within the operable unit boundary.
- Operable Unit 3 (OU 3): Production Area. 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 line, wastewater treatment facilities, fire training facilities, scrap metal piles, feedstocks, and coal pile.
- Operable Unit 4 (OU 4): Silos 1-4. Silos 1, 2, 3, and 4, berms, decant tank system, and soil within the operable unit boundary.
- Operable Unit 5 (OU 5): Environmental Media. Groundwater, surface water, soil not included in the definitions of OU # 1-4, sediments, flora, and fauna.
- Comprehensive Site-Wide Operable Unit: An evaluation of remedies selected for OUs 1-5 above (including remedial and removal actions) to ensure that they are protective of human health and the environment on a site-wide basis, as required by CERCLA, the NCP and applicable U.S. EPA policy and guidance.

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Operable Unit 1: Waste Pit Area

1.1 Field Investigation

13-Well Program

a. Status of Work - Key Milestones

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 HSL parameters and characteristic radionuclides. Wells were developed and sampled to determine constituents of concern in the waste pit leachate.

All waste pit wells have been sampled according to the approved work plan. Wells will be formally transferred to the FEMP Operating Contractor in order to collect water-level data and to facilitate future sampling requirements.

Laboratory analysis continued throughout January. The contract laboratory has scheduled February 10, 1992 as the completion date for Operable Unit I sample analysis.

b. Issues/Problems

Some of the Operable Unit 1 samples have high levels of calcium which is causing interference with the analysis for radium-226 and radium-228.

Extremely high concentrations of uranium and thorium in waste pit samples have resulted in delays in completion of sample analysis for the following reasons: 1) High concentrations of uranium have been shown to exceed the capacity of the ion-exchange resin used to remove uranium prior to analysis of other alpha emitters; 2) High and generally unpredictable concentrations of uranium and thorium in samples has led to difficulty in determining the proper amount of tracer to add to the samples; and 3) Large variations in the uranium/thorium ratios have made it difficult to correctly select the aliquot necessary to perform the analyses. This has resulted in the need to re-analyze these samples.

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Operable Unit 1: Waste Pit Area

1.1 Field Investigation (cont'd.)

13-Well Program (cont'd.)

c. **Corrective Actions**

The following actions have been taken to resolve these problems:

1) An alternate procedure was developed that added a second ion-exchange column to remove all uranium prior to follow-on analysis.

2) Tentative estimates of the uranium and thorium concentrations are now being made using gamma spectroscopy. These estimates allow better determination of sample aliquot size and tracer amounts.

3) Different size aliquots are being used in separate procedures for all uranium/thorium analysis instead of using the sequential method of uranium/thorium analysis.

d. **Planned Activities for February 1992**

Complete the laboratory analyses of Operable Unit 1 waste pit samples.

Radon Sampling Program

a. **Status of Work - Key Milestones**

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 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.

Radon sampling was completed for Waste Pits 1, 2, and 3. The data are being evaluated and a report is expected by late February. Sampling will not be attempted on Pit 4 since it is covered by a synthetic cap. Pit 5 will not be sampled since it is a wet pit.

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Operable Unit 1: Waste Pit Area

1.1 Field Investigation (cont'd.)

Radon Sampling Program (cont'd.)

a. **Status of Work - Key Milestones**

Activity	Comment
Initiate radon flux measurements of Waste Pits; early start January 7, 1992.	Field work completed; results are expected in February.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Complete data evaluation.

Pits 5, 6, and Clearwell Sampling Program

a. **Status of Work - Key Milestones**

The objective of the Pits 5, 6, and Clearwell Sampling Program is to obtain sufficient quantities of samples for treatability studies and to provide additional RCRA characterization information on the waste pits. The pits will be sampled using one of the following methods, as appropriate.

a) slurry pump and backhoe
b) clamshell and crane
c) bailer
d) vibra-core sampler

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Operable Unit 1: Waste Pit Area

1.1 Field Investigation (cont'd.)

Pits 5, 6, and Clearwell Sampling Program (cont'd.)

a. Status of Work - Key Milestones

The sampling of Pits 5, 6, and the Clearwell was scheduled to begin on December 16, 1991. The sampling was delayed due to the unavailability of the Carlisle crane. On January 29, 1992, samples were extracted from Pit 5. These samples are presently being screened for radioactivity prior to being shipped to the contract laboratory for analyses. The field crew and sampling equipment are being mobilized in order to initiate sampling activities at Pit 6. Pit 6 is to be sampled by February 15, 1992. Clearwell sampling will follow.

Activity	Comment
Sample Pits 5, 6 and Clearwell December 19, 1991.	Sampling delayed due to unavailability of equipment; Pit 5 samples were collected on January 29, 1992.

b. Issues/Problems

The delay in collecting samples from Pits 5, 6, and the Clearwell will impact the May 26, 1992 completion date for preliminary analysis because the treatability and characterization data may not be available. All samples from Pits 5, 6, and the Clearwell will undergo the planned treatability testing as they are received in the laboratory. However, the characterization data for these pits may not be available for inclusion in the first draft of the RI Report.

c. Corrective Actions

Efforts are underway to expedite sampling.

d. Planned Activities for February 1992

Sample Pit 6 and the Clearwell. Initiate analysis of Pit 5 samples.

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Operable Unit 1: Waste Pit Area

1.2 Remedial Investigation

a. Status of Work - Key Milestones

A Remedial Investigation (RI) Report will be prepared in accordance with the U.S. EPA Guidance Document for conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA Directive 93553-01) and the Human Health Evaluation Manual (EPA/540/1-89/002).

The first activity scheduled for the RI is the field data analysis. The objective of the field data analysis activity is to evaluate the preliminary data available from field measurements while awaiting results from the laboratory analysis. The field data analysis was initiated on December 2, 1991 with the revision of the waste pit cross sections. With the new boring logs that were obtained from the recent 13-well field investigation, data are available for the entire depth of Waste Pits 1, 2, 3, 4, and the Burn Pit. Preliminary data from the new borings indicate the projected depths of the waste pit bottoms are within three to six feet of their actual bottoms. The exception to this finding is the Burn Pit bottom, where the actual depth is approximately 10 feet deeper than originally projected.

b. Issues/Problems

Delays in sampling Pits 5, 6, and the Clearwell will delay receipt of the characterization data for these pits. As a result, preparation of the RI Report will begin before receipt of the data from these pits. However, the Pit 5, 6, and Clearwell data will be available and incorporated before the draft report is submitted.

c. Corrective Actions

Proceed with preparation of the RI Report using characterization data from Pits 1, 2, 3, 4, and the Burn Pit. Incorporate Pits 5, 6, and Clearwell data into RI Report when they are available. There should be no impact to the Consent Agreement As Amended schedule.

d. Planned Activities for February 1992

Initiate work on the draft RI Report.

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Operable Unit 1: Waste Pit Area

1.3 Treatability Studies

a. **Status of Work - Key Milestones**

The Operable Unit 1 treatability studies will provide data for the evaluation of the two treatment process options identified in the Operable Unit 1 Initial Screening of Alternatives document. The two treatment process options are cement stabilization and vitrification. The technical feasibility of these technologies will be determined by conducting a series of experiments on both composite waste samples and individual strata samples. Varying formulations will be investigated, as will other performance criteria such as unconfined compressive strength (UCS), leachability, bulking factor and permeability. For cement stabilization, binding agents that will be evaluated include portland cement, fly ash, 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 fly ash, soil, and sodium hydroxide.

To date, all Stage I molds for the cement stabilization studies have been made for Pits 1, 2, 3, and 4. UCS tests were initiated following a 28-day cure time. As of January 20, 1992, all molds for Pits 1, 2, 3, and 4 had been tested for UCS. Preliminary data indicate that the UCS ranges from approximately 93 to 758 psi depending upon the ratio of stabilizing agents to waste. All Burn Pit molds will be tested for UCS by February 12, 1992. Extractions for Modified Toxicity Characteristic Leaching Procedure (MTCLP) were initiated and are presently being reported.

Details for a treatability sample tracking data base are being completed.

Activity	Comment
Start preliminary Treatability Studies on November 13, 1991.	Open; preliminary Treatability Studies began on November 14, 1991.

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Operable Unit 1: Waste Pit Area

1.3 Treatability Study (cont'd.)

b. **Issues/Problems**

The delay in collecting samples from Pits 5, 6, and the Clearwell may delay completion of the preliminary analysis, which is scheduled for May 26, 1992.

Delivery of hazards containment modules was delayed by the module vendor. This delay may potentially impact completion of the vitrification portion of the study.

c. **Corrective Action**

Expedite sampling of Pits 5, 6, and the Clearwell. Once samples are collected, attempts will be made to expedite the analyses of the samples to get back on the schedule of May 26, 1992.

Expedite the delivery of hazards containment modules from the vendor and evaluate the schedule to determine the impact to milestone deliverables.

d. **Planned Activities for February 1992**

Continue the first phase of cement stabilization treatability testing. Initiate the first phase of vitrification treatability testing.

1.4 Feasibility Study

a. **Status of Work - Key Milestones**

No activity was scheduled for this phase of the program during January 1992.

Activity	Comment
Submit draft Feasibility Study Report/Comprehensive Response Action Risk Evaluation to the U.S. EPA on March 7, 1994.	Open, on schedule. No current activity required.

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Operable Unit 1: Waste Pit Area

1.4 Feasibility Study (cont'd.)

b. **Issues/Problems**

None to report.

c. **Corrective Action**

None required.

d. **Planned Activities for February 1992**

None scheduled.

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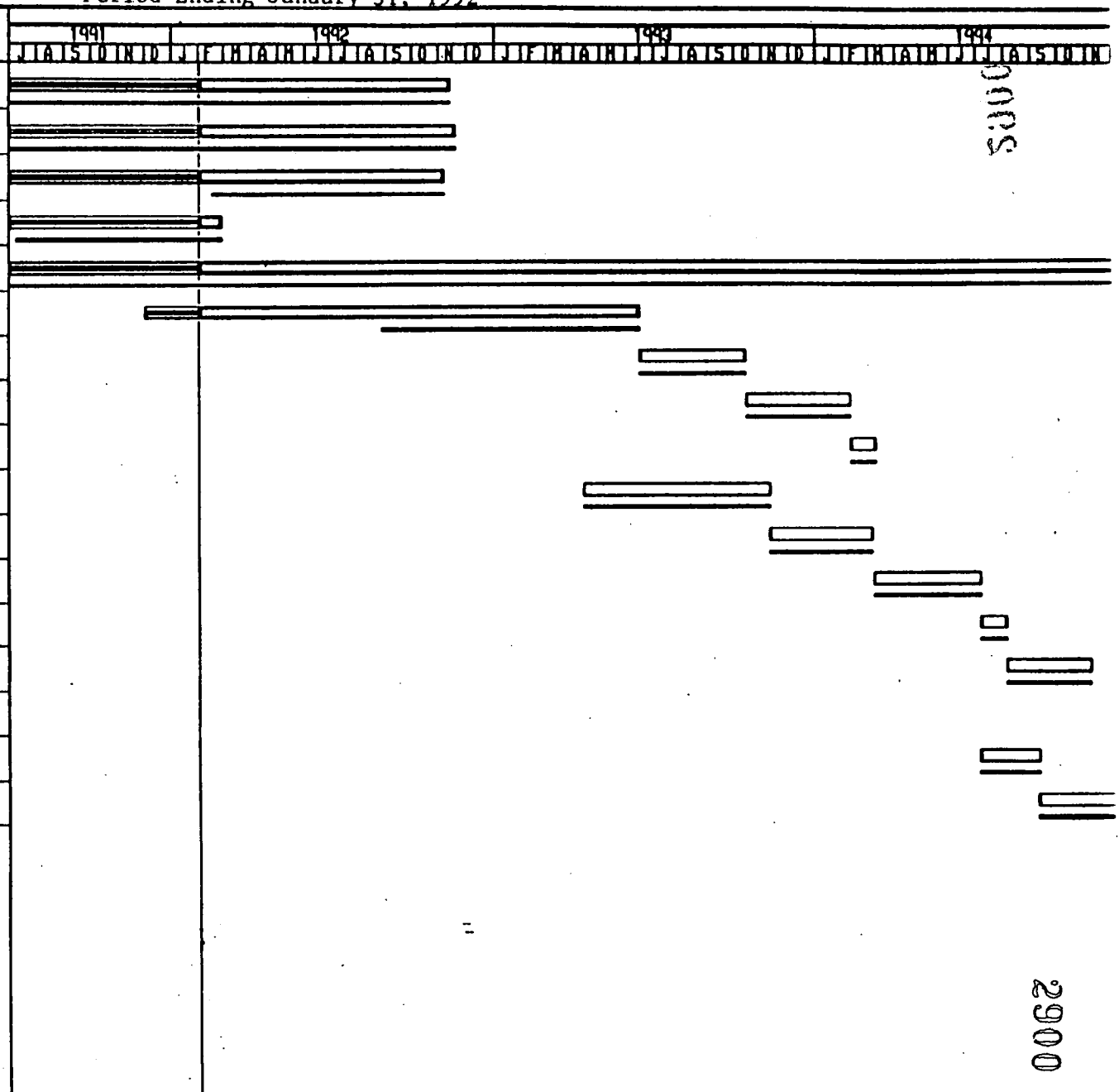
OPERABLE UNIT 1 RELATED FIELD ACTIVITIES AS 1MAR91 LF 12NOV92	
OU1 13 WELL PROGRAM AS 1MAR91 LF 19NOV92	
OU1 RADON FLUX PROGRAM AS 23MAY91 LF 5NOV92	
PIT 5, 6, AND CLEARWELL SAMPLING PROGRAM AS 1JUL91 LF 28FEB92	
OU1 TREATABILITY STUDIES AS 30APR91 LF 5DEC94	
OU1 REMEDIAL INVESTIGATION REPORT PREPARATION AS 2DEC91 LF 14JUN93	
DOE OU1 RI REVIEW/REVISE/APPROVE LS 15JUN93 LF 11OCT93	
EPA OU1 RI REVIEW & APPROVE LS 13OCT93 LF 7FEB94	
PRINT AND DISTRIBUTE FINAL OU1 RI REPORT LS 8FEB94 LF 7MAR94	
OU1 FEASIBILITY STUDY/PROPOSED PLN PREP LS 12APR93 LF 8NOV93	
DOE OU1 FS/PP REVIEW/REVISE/APPROVE LS 9NOV93 LF 4MAR94	
EPA OU1 FS/PP REVIEW/REVISE/APPROVE LS 7MAR94 LF 4JUL94	
PRINT AND DISTRIBUTE FINAL OU1 FS RPT/PP LS 5JUL94 LF 1AUG94	
OU1 PUBLIC COMMENT LS 2AUG94 LF 3NOV94	
SUBMIT OU1 DRAFT ROD TO EPA LF 6DEC94	
OU1 DRAFT ROD PREPARATION LS 4JUL94 LF 7SEP94	
DOE OU1 DRAFT ROD REVIEW/REVISE/APPROVE LS 7SEP94 LF 6DEC94	



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

Primavera Systems, Inc. 1984-1991

RI/FS PROGRAM
FERNALD ENVIRONMENTAL MGMT. PROJECT
FEMP RI/FS OU1 CONSENT AGMT (LATE)

Sheet 1 of 1

Project Start : 10CT90
Project Finish: 19OCT98

Data Date: 2FEB92
Plot Date: 6FEB92

Prepared by ASI/IT Corp.

Date	Revision	Checked	Approved

2900

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Operable Unit 2: Other Waste Units

2.1 Field Investigation

19-Boring/Well Program

a. **Status of Work - Key Milestones**

This program provides additional characterization of the individual waste units within Operable Unit 2. Borings are located in two fly ash 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 lime sludge ponds is also included in this program.

All sampling for Operable Unit 2 has been completed according to the approved work plan.

Laboratory analyses were completed in January 1992 and are in the process of being verified.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Complete the validation of all Operable Unit 2 samples and analytical results.

Additional HSL Parameters Sampling Program

a. **Status of Work - Key Milestones**

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

All sample collection activities were completed in prior months, and HSL laboratory analyses were completed.

Operable Unit 2: Other Waste Units

2.1 Field Investigation (cont'd.)

Additional HSL Parameters Sampling Program (cont'd.)

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Complete validation of samples and analytical results.

2.2 Remedial Investigation

a. **Status of Work - Key Milestones**

The purpose of the treatability studies is to provide additional information to support the Feasibility Study and subsequent remedy selection for Operable Unit 2. Specifically, the study will demonstrate whether stabilization can achieve a desired level of material strength, as well as obtain quantitative data for geochemical modeling and subsequent computer modeling of groundwater contaminant transport. The study is composed of two parts: preliminary stages (to support remedy screening) and advanced stages (to support remedy selection). The preliminary stage involved evaluating a range of stabilization mix formulations in order to determine a representative formulation which meets the proposed strength criteria. The advanced stage study involves performing toxicity characteristic leaching procedure (TCLP) and permeability tests on stabilized waste using representative formulations determined in the preliminary stage.

A request was made to the U.S. EPA and verbal approval received on December 3, 1991 regarding changing the requirement for passing both the UCS and the MTCLP for proceeding from the Preliminary Stage I to the Advanced Phase from six to four samples for the South Field area.

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Operable Unit 2: Other Waste Units

2.2 Remedial Investigation (cont'd.)

a. **Status of Work - Key Milestones**

Activity	Comment
Issue draft RI Report/Baseline Risk Assessment to the U.S. EPA by October 19, 1992.	Open, on schedule.

b. **Issues/Problems**

Due to the delay in obtaining analytical results from the laboratory, the early finish target date for the RI Report completion has slipped.

c. **Corrective Actions**

A schedule recovery plan has been prepared to reduce the slippage.

d. **Planned Activities for February 1992**

Obtain MTCLP results for Preliminary Stages I and II samples.

Conduct permeability testing.

Receipt of Preliminary TCLP results from advanced stage study.

Continue preparation of the RI Report.

Initiate fate and transport calculations and the baseline risk assessment portion of the RI Report.

Operable Unit 2: Other Waste Units

2.3 Feasibility Study

a. **Status of Work - Key Milestones**

No Feasibility Study activities were scheduled in January 1992.

Activity	Comment
Issue draft Feasibility Study Report/Comprehensive Response Action Evaluation to the U.S. EPA by March 15, 1993.	Open, on schedule.
Issue the Proposed Plan to the U.S. EPA by March 15, 1993.	Open, on schedule.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

None scheduled.

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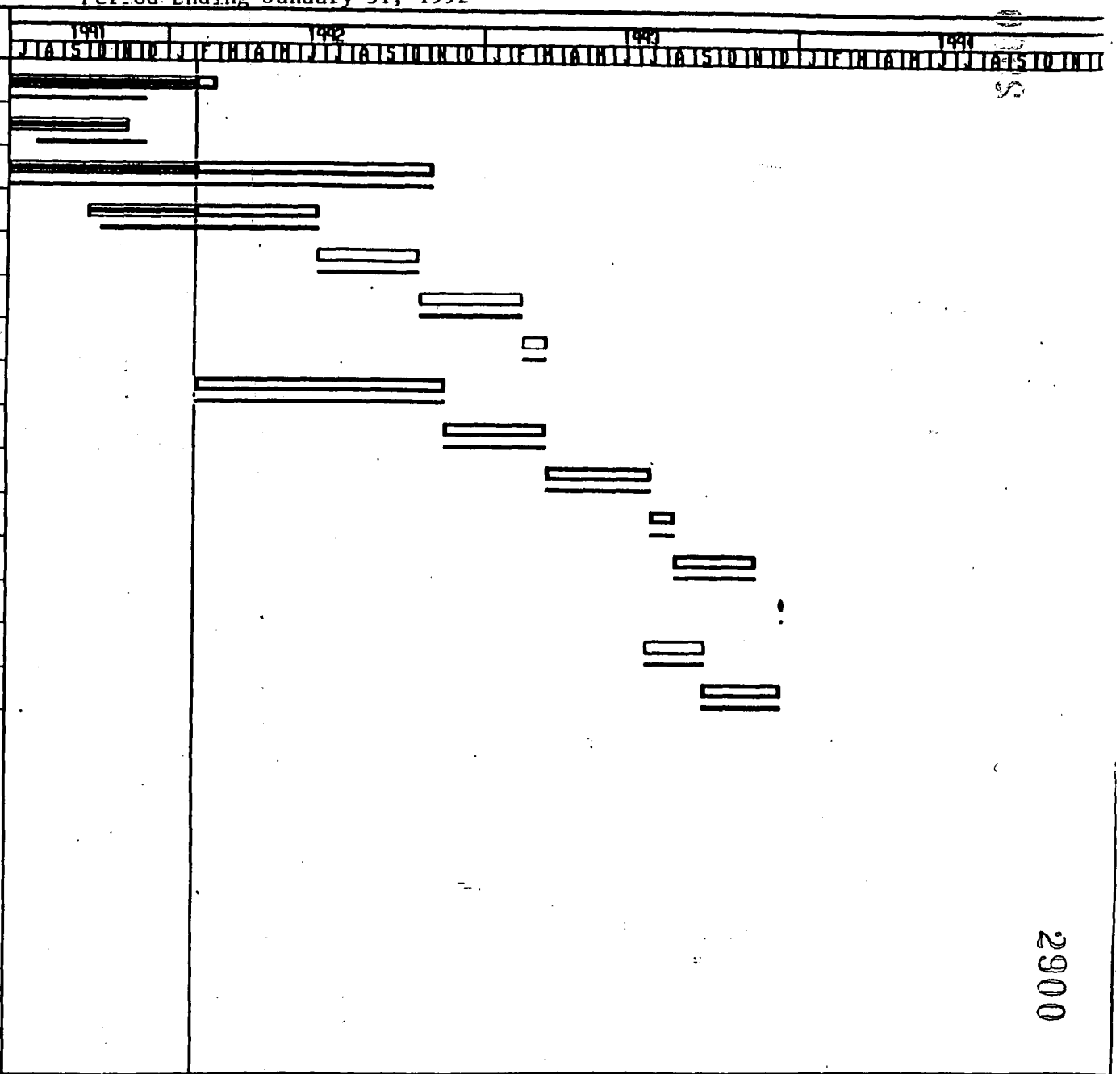
OU2 19 WELL PROGRAM AS 1MAR91 LF 24FEB92	
OU2 ADDITIONAL HSL SAMPLING PROGRAM AS 1JUL91 AF 15NOV91	
OU2 TREATABILITY STUDIES AS 1APR91 LF 2NOV92	
OU2 REMEDIAL INVESTIGATION REPORT PREPARATION AS 10CT91 LF 22JUN92	
DOE OU2 RI REVIEW/REVISE/APPROVE LS 23JUN92 LF 16OCT92	
EPA OU2 RI REVIEW & APPROVE LS 20OCT92 LF 12FEB93	
PRINT AND DISTRIBUTE FINAL OU2 RI REPORT LS 15FEB93 LF 12MAR93	
OU2 FEASIBILITY STUDY/PROP PLAN PREP LS 4FEB92 LF 16NOV92	
DOE OU2 FS/PP REVIEW/REVISE/APPROVE LS 17NOV92 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	



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

Primavera Systems, Inc 1984-1991

Project Start : 10CT90
Project Finish: 10OCT00

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

Sheet 1 of 1

Data Date: 2FEB92

Prepared by ASI/IT Corp.

Date	Revision	Checked	Approved

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

Period Ending January 31, 1992

Operable Unit 3: Production Area

3.1 Field Investigation

a. **Status of Work - Key Milestones**

No activities were scheduled for Operable Unit 3 site characterization during January 1992.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

None scheduled.

3.2 Remedial Investigation

a. **Status of Work - Key Milestones**

The Operable Unit 3 scoping activities in January included a continuing analysis of the data collected during previous months, finalizing the Operable Unit 3 Work Plan methodology/rationale, and developing draft sections of the work plan addenda.

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

Period Ending January 31, 1992

Operable Unit 3: Production Area

3.2 Remedial Investigation (cont'd.)

a. Status of Work - Key Milestones

The existing available data collection/analysis began in July 1991 as one of the initial scoping activities. As of January 31, 1992 this activity was essentially completed, although minor modifications to the data summaries will be made, as needed, during development of the Operable Unit 3 Work Plan Addenda. All of the available data have been summarized in one or more summary tables. These tables will be included in the Operable Unit 3 RI/FS Work Plan Addendum. The key data summary tables are listed below:

Operable Unit 3 Component List
Description of Building Types by Grouping
Description of Structures and Processes
Potential Contaminants
Nature and Extent of Contamination
Operable Unit 3 Structures/Equipment Radiological Surveys
Radiological Surveys of Abandon-in-Place (AIP) Equipment
Operable Unit 3 Air Quality Data
Operable Unit 3 Material Balance Flow (Chemical Summary)
Laboratory Building Mercury Vapor Survey
Inventory of Drummed Non-RCRA Waste
Inventory of Drummed RCRA Waste
Inventory of Product

Development of the Operable Unit 3 Work Plan methodology/rationale continued throughout January 1992. This activity includes developing the methodology for identification of data voids, integration of interim actions, data collection strategies, and the field characterization approach. This methodology/rationale will be presented to and discussed with the U.S. EPA and the Ohio EPA at a meeting scheduled for February 12, 1992.

Approximately 50% of the work plan addenda sections have been completed in initial draft form, including the data summary tables discussed above. The remaining sections will be completed in first draft by mid to late February.

Activity	Comment
Issue draft Work Plan to the U.S. EPA on June 2, 1992.	Open, on schedule.

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

Period Ending January 31, 1992

Operable Unit 3: Production Area

3.2 Remedial Investigation (cont'd.)

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for February 1992

Present Operable Unit 3 Work Plan methodology/rationale to the U.S. EPA and the Ohio EPA.

Complete first draft of all work plan addenda sections.

3.3 Feasibility Study

a. Status of Work - Key Milestones

No activities were scheduled for the Operable Unit 3 Feasibility Study during January 1992.

b. Issues/Problems

None to report.

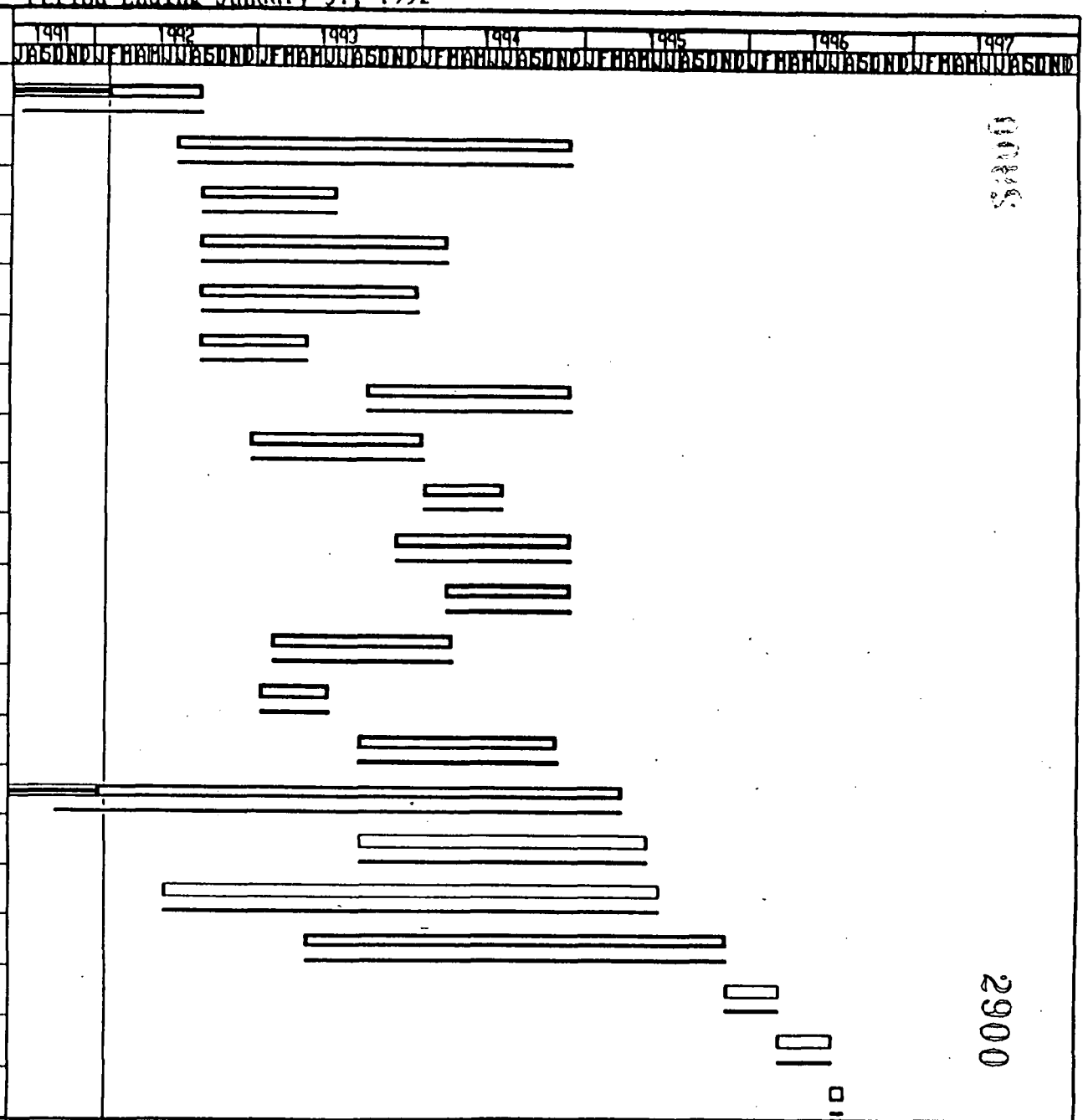
c. Corrective Actions

None required.

d. Planned Activities for February 1992

None scheduled.

SCOPING OF OPER. UNIT 3	AS 1JUL91 LF 27AUG92
OPERABLE UNIT 3 FIELD RELATED ACTIVITIES	LS 3JUL92 LF 2DEC94
ADMINISTRATION BUILDING	LS 28AUG92 LF 28JUN93
WAREHOUSE/STORAGE BUILDINGS	LS 28AUG92 LF 1MAR94
CHEMICAL PROCESS PLANT	LS 28AUG92 LF 24DEC93
METAL PROCESS PLANT	LS 28AUG92 LF 26APR93
SUPPORT FACILITIES	LS 6SEP93 LF 2DEC94
ABV. GRND. TANKS/UTIL./EQUIP.	LS 22DEC92 LF 7JAN94
PARKING LOTS/RAILROAD TRACKS/ROADS	LS 11JAN94 LF 5JUL94
WASTE PROCESSING FACILITIES	LS 11NOV93 LF 2DEC94
INVENTORY SAMPLING	LS 2MAR94 LF 2DEC94
BULK CONTAMINANTS	LS 11FEB93 LF 16MAR94
PONDS/BASINS	LS 15JAN93 LF 16JUN93
SUBSURFACE TANKS/UTIL./EQUIP.	LS 23AUG93 LF 4NOV94
SAFE SHUTDOWN BY WEMCO	AS 1JUL91 LF 29MAR95
OU3 BL RISK ASSESSMENT	LS 25AUG93 LF 24MAY95
OU3 TREATABILITY STUDIES	LS 15JUN92 LF 20JUN95
OU3 REMEDIAL INVESTIGATION REPORT PREP	LS 27APR93 LF 15NOV95
DOE OU3 RI REVIEW/REVISE/APPROVE	LS 16NOV95 LF 13MAR96
EPA OU3 RI REVIEW/REVISE/APPROVE	LS 14MAR96 LF 9JUL96
PRINT AND DISTRIBUTE FINAL OU3 RI REPORT	LS 10JUL96 LF 6AUG96



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

Primavera Systems, Inc 1984-1991

Project Start : 10CT90
Project Finish: 19OCT98

RI/FS PROGRAM
FERNALD ENVIRONMENTAL MGMT. PROJECT
FEMP RI/FS OU3 CONSENT AGMT (LATE)

Sheet 1 of 2

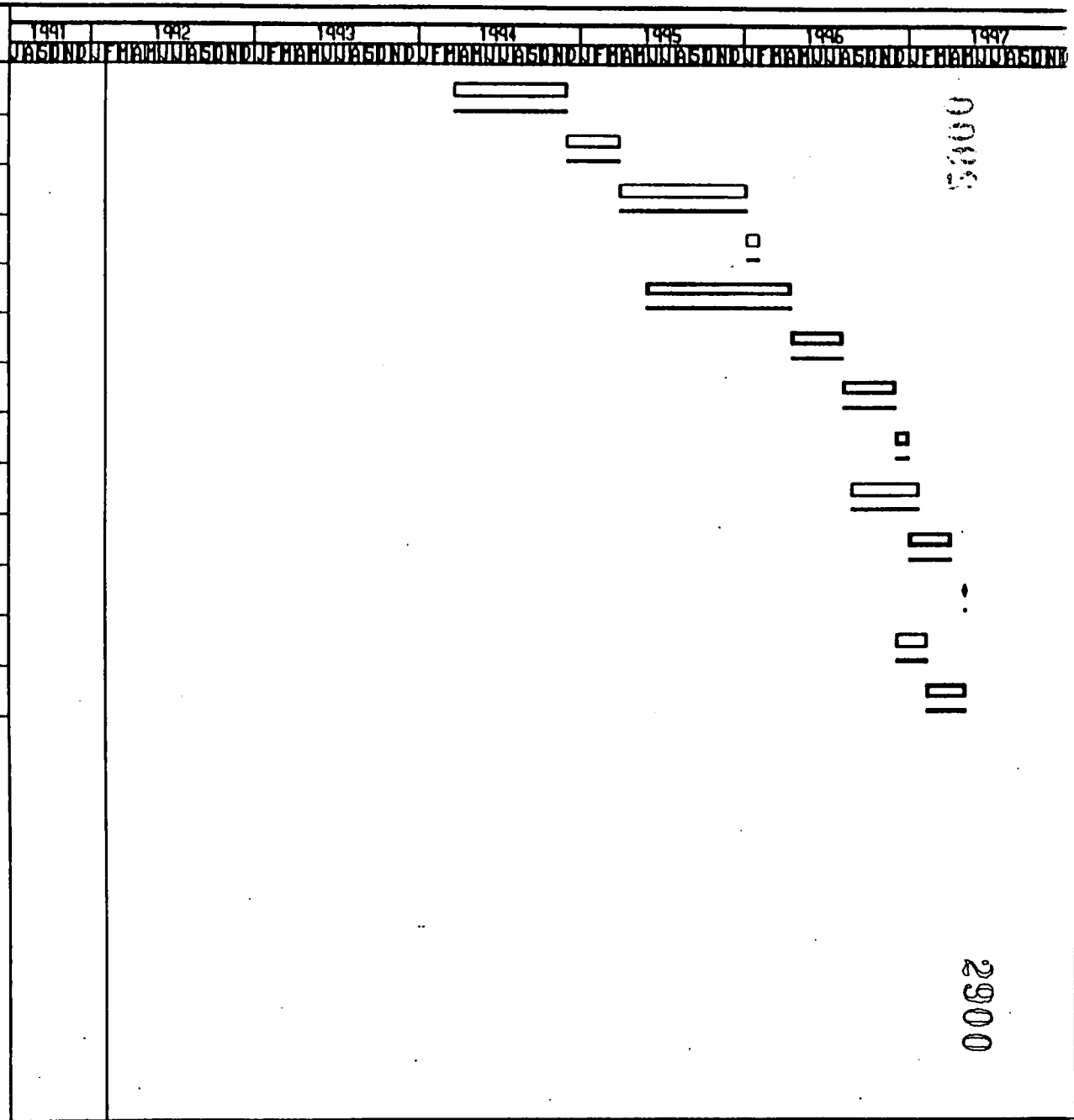
Data Date: 2FEB92
Plot Date: 6FEB92

Prepared by ASI/IT Corp.

Date	Revision	Checked	Approved

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT
Period Ending Januayr 31, 1992

OU3 INITIAL SCREENING OF ALTERNATIVES RPT PREP LS 22MAR94 LF 29NOV94	
DOE OU3 ISA REVIEW/REVISE/APPROVE LS 30NOV94 LF 27MAR95	
EPA OU3 ISA REVIEW/REVISE/APPROVE LS 28MAR95 LF 4JAN96	
PRINT AND DISTRIBUTE FINAL OU3 ISA REPORT LS 5JAN96 LF 1FEB96	
OU3 FEASIBILITY STUDY/PROPOSED PLAN PREP LS 25MAY95 LF 11APR96	
DOE OU3 FS/PP REVIEW/REVISE/APPROVE LS 12APR96 LF 6AUG96	
EPA OU3 FS/PP REVIEW/REVISE/APPROVE LS 7AUG96 LF 2DEC96	
PRINT AND DISTRIBUTE FINAL OU3 FS/PP LS 3DEC96 LF 30DEC96	
OU3 DRAFT NOTICE OF AVAILABILITY (NOA) LS 27AUG96 LF 20JAN97	
OU3 PUBLIC COMMENT PERIOD LS 31DEC96 LF 3APR97	
SUBMIT OU3 DRAFT ROD TO EPA LF 2MAY97	
OU3 DRAFT ROD PREPARATION LS 2DEC96 LF 5FEB97	
DOE OU3 DRAFT ROD REVIEW/REVISE/APPROVE LS 5FEB97 LF 2MAY97	



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

RI/FS PROGRAM
FERNALD ENVIRONMENTAL MGMT. PROJECT
FEMP RI/FS OU3 CONSENT AGMT (LATE)

Sheet 2 of 2

Prepared by ASI/II Corp.

Date	Revision	Checked	Approved

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

Period Ending January 31, 1992

Operable Unit 4: Silos 1-4

4.1 Field Investigation

a. **Status of Work - Key Milestones**

Five slant or angled borings were advanced beneath K-65 Silos 1 and 2 and the Decant Sump Tank. Laboratory analysis of sample media was completed in January 1992.

Four vertical borings were advanced into the earthen berm of Silos 1 and 2. Laboratory analysis of sample media was completed in January 1992.

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

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Complete the validation of all Operable Unit 4 samples.

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

Period Ending January 31, 1992

Operable Unit 4: Silos 1-4

4.2 Remedial Investigation

a. **Status of Work - Key Milestones**

The purpose of the Remedial Investigation (RI) is to provide a summary of the field investigations and to support the Feasibility Study 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 risk assessment, which establishes remedial action objectives.

Operable Unit 4 RI activities in January included gathering and analyzing available field and analytical data, starting revisions to the previous draft of the RI Report, and continuing model revisions for the risk assessment.

Activity	Comment
Submit Remedial Investigation Report/Baseline Risk Assessment to the U.S. EPA by April 19, 1993.	Open, on schedule.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Continue revisions to the RI Report/Baseline Risk Assessment.

Complete data gathering and validation of data.

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

Period Ending January 31, 1992

Operable Unit 4: Silos 1-4

4.2 Remedial Investigation (cont'd.)

Treatability Study

a. Status of Work - Key Milestones

The purpose of a Treatability Study Work Plan and subsequent study is to provide additional information to support the FS and remedy selection. There are two separate work plans/studies to support the Operable Unit 4 FS. One study considers cement stabilization of Silos 1, 2, and 3, material and acid leaching, and leachate purification of Silos 1 and 2 material. The second study considers the vitrification of Silos 1, 2, and 3 material.

The revised Stabilization/Chemical Extraction Treatability Study Work Plan and a response to comments document was transmitted to the U.S. EPA and the Ohio EPA for receipt on January 3, 1992. Approval of the Stabilization/Chemical Extraction Treatability Study Work Plan was received from the Ohio EPA on January 29, 1992.

Stabilization treatability studies continued in January. Twelve Silo 3 specimens completed the 28-day curing stage under preliminary phase Stage II. UCS tests were conducted with preliminary results ranging from 110-900 psi with the majority over 500 psi. Extractions for MTCLP have not been completed. Stage II - Silos 1 and 2 (15 per silo) specimens completed the 28-day curing stage and UCS tests are being conducted.

Acid leaching tests - Stage I for the chemical extraction treatability studies were completed in January 1992. Preliminary results indicate that single extractions are not adequate, and Ethylene Diamine Tetra-acetic Acid (EDTA) is a more promising extractant than the acids.

The Treatability Study Work Plan for the vitrification of Residues from Silos 1, 2, and 3 considers vitrification of silo material, determines quantity and composition of the off-gas generated during vitrification, radon emanation rate from the vitrified waste, and the leachability of the vitrified waste.

Operable Unit 4: Silos 1-4

4.2 Remedial Investigation (cont'd.)

Treatability Study

a. **Status of Work - Key Milestones**

A revised Treatability Study Work Plan for the Vitrification of Residues from Silos 1, 2, and 3 was submitted to the U.S. EPA and the Ohio EPA on January 29, 1992.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Initiate Advanced Stage I stabilization treatability studies.

4.3 Feasibility Study

a. **Status of Work - Key Milestones**

Limited preliminary reviews of the draft FS were conducted during January 1992.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

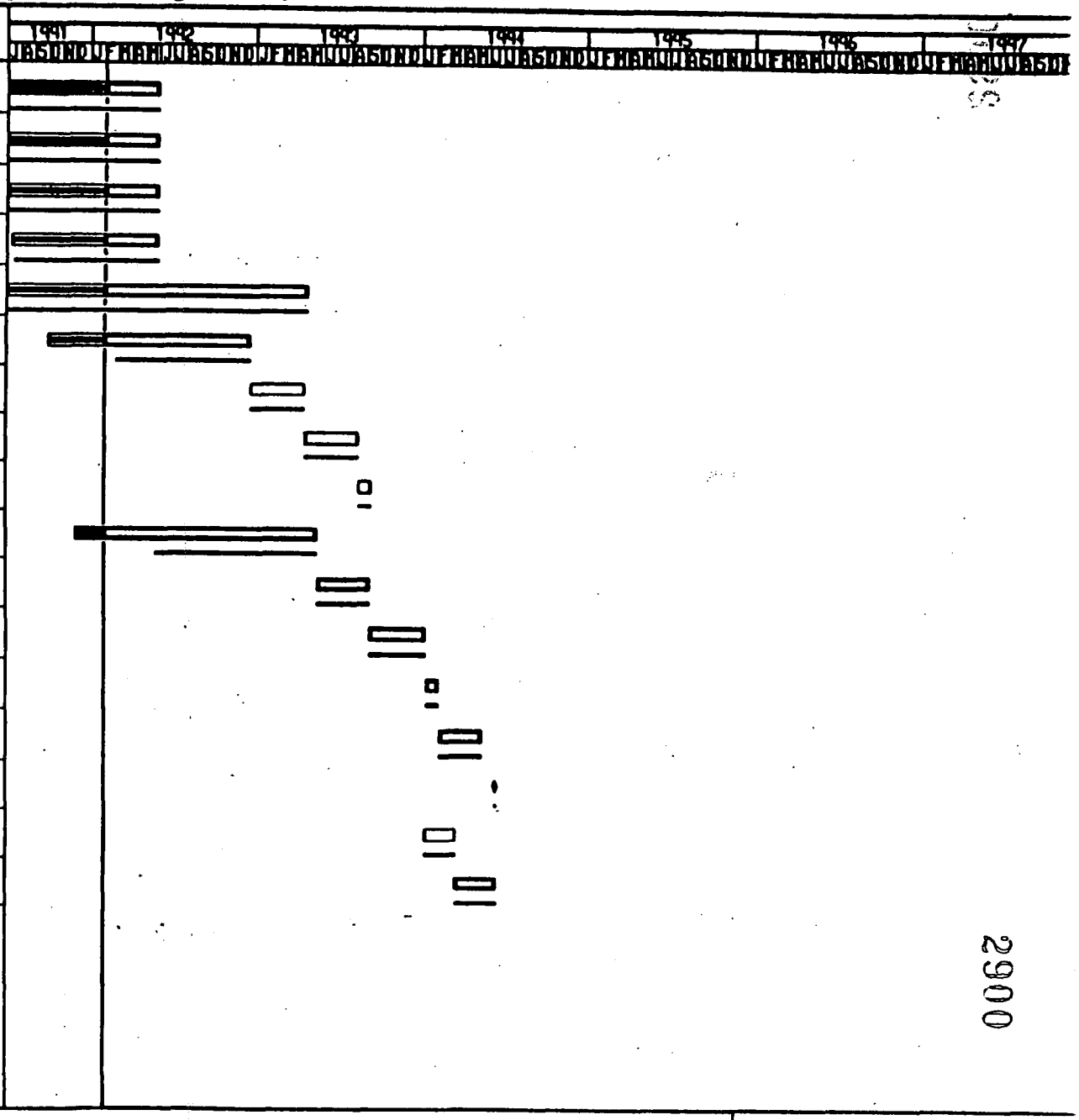
None required.

d. **Planned Activities for February 1992**

Continue limited work on the FS.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT
Period Ending January 31, 1992

OPERABLE UNIT 4 RELATED FIELD ACTIVITIES AS 15JAN91 LF 28MAY92	
OU4 FIELD ACTIVITY - SLANT BORINGS AS 25JAN91 LF 28MAY92	
OU4 FIELD WORK - VERTICAL BORINGS AS 15JAN91 LF 28MAY92	
OU4 FIELD WORK - CONTENT SAMPLING AS 12JUL91 LF 28MAY92	
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 20EC91 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 7FEB94 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	



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

Primavera Systems, Inc 1984-1991

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

Project Start : 10CT90
Project Finish: 19OCT98

Sheet 1 of 1

Data Date: 2FEB92
Plot Date: 6FEB92

Prepared by ASI/II Corp

Date	Revision	Checked	Approved

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.1 Field Investigation

Paddy's Run Seepage Investigation Program

a. **Status of Work - Key Milestones**

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

Groundwater sampling of all monitoring wells within the Paddy's Run Seepage Investigation was completed in January 1992. Two surface water samples were taken along Paddy's Run.

Laboratory results for total uranium on two out of five wells installed in November 1991 have not been received. Previous laboratory results on the other three wells for total uranium indicate that no additional contingency wells are required.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Complete the monthly groundwater sampling program for this task. Complete the turnover of the monthly groundwater measurement task to the FEMP Operating Contractor.

Complete the analyses for total uranium on Wells 2552 and 2553.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.1 Field Investigation (cont'd.)

Facility Testing

a. **Status of Work - Key Milestones**

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

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Continue validation effort of samples affiliated with this task.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.1 Field Investigation (cont'd.)

31-Well Program

a. Status of Work - Key Milestones

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

The final well remaining under the 31-Well Program, Well 2395, was completed. Preliminary analysis for total uranium indicated that no contingency wells will be required. Well 2395 requires the second round of groundwater sampling before turnover to the FEMP Operating Contractor.

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for February 1992

Complete the second round of groundwater sampling on Well 2395.

8-RCRA Well Program

a. Status of Work - Key Milestones

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

Well 1646 was developed and the initial round of groundwater sampling was completed.

b. Issues/Problems

None to report.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.1 Field Investigation (cont'd.)

8-RCRA Well Program (cont'd.)

c. Corrective Actions

None required.

d. Planned Activities for February 1992

Complete the second and final groundwater sampling on Well 1646.

Miscellaneous Additional Wells Program

a. Status of Work - Key Milestones

Miscellaneous Additional Wells are being installed to fill in data gaps defined through recent sampling activities.

Conditional approval of the Work Plan Addendum was issued by the U.S. EPA on November 25, 1991 pending incorporation of several comments. Conditional approval was issued by the Ohio EPA on November 14, 1991, also pending response to several comments. Response to these comments were completed and transmitted to the U.S. EPA and the Ohio EPA on January 22, 1992.

Installation of wells under this program were initiated prior to resolution of comments in an effort to adhere to Consent Agreement As Amended schedules. Minimal impact to the program is expected as a result of these comments since the content of the comments pertained largely to clarification of information. The locations of the wells were found acceptable.

The following wells have been installed and/or developed and sampled:

- Well 2421 Installation complete. Developed and sampled first round of groundwater.
- Well 2398 Installation complete. Developed and sampled first round of groundwater.
- Well 2399 Installation complete. Developed and sampled first round of groundwater.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.1 Field Investigation (cont'd.)

Miscellaneous Additional Wells Program (cont'd.)

a. Status of Work - Key Milestones

- Well 3421 — Installation complete. Developed and sampled first round of groundwater.
- Well 2171 — Installation complete.
- Well 2420 — Installation complete. Developed and sampled first round of groundwater.
- Well 2400 — Installation complete. Developed and sampled first round of groundwater.
- Well 2402 — Installation complete. Developed and sampled first round of groundwater.
- Well 2678 — Installation complete.
- Well 2679 — Installation complete.

b. Issues/Problems

The total uranium results from testing identified Well 2402 contained 27 ug/l uranium. The results indicate that a contingency well, Well 3402, will be required for Well 2402.

c. Corrective Actions

Generate a schedule for the installation of contingency Well 3402.

d. Planned Activities for February 1992

Continue installation of wells in the Miscellaneous Additional Wells Program.

Finalize Miscellaneous Additional Wells Work Plan Addendum.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.1 Field Investigation (cont'd.)

Auger and Cable Sampling Program

a. Status of Work - Key Milestones

Additional wells will be installed within additional suspect areas to refine the lateral and vertical extent of contamination identified during the production and additional suspect area program. Soil and groundwater sampling will be conducted.

The revised work plan addenda for this program was submitted for final internal review prior to submittal to the U.S. EPA and the Ohio EPA. The review and approval process for this work plan is behind schedule.

b. Issues/Problems

The review and approval process for the Auger and Cable Sampling Program work plan addenda is several months behind the baseline schedules. Further delay may impact Consent Agreement As Amended schedules.

c. Corrective Actions

Priority should be given to finalizing the review and approval of this document to expedite its submittal to the U.S. EPA and the Ohio EPA.

d. Planned Activities for February 1992

Receive internal approval of the Auger and Cable Sampling Program Work Plan Addenda Scope of Work.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.2 Remedial Investigation

a. **Status of Work - Key Milestones**

The purpose of the Treatability Studies is to provide information to support the Feasibility Study (FS) and subsequent remedy selection for Operable Unit 5. Specifically, the study will demonstrate the feasibility of soil washing as a remedial technology for soils. 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, 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.

Comments on the Operable Unit 5 Treatability Study Work Plan were received from the U.S. EPA and the Ohio EPA on January 15, 1992. Responses to these comments, as well as a revised work plan, are being prepared.

Activity	Comment
Submit draft Treatability Study Work Plan to the U.S. EPA and the Ohio EPA by April 17, 1992.	Completed ahead of schedule. December 10, 1991

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for February 1992**

Respond to comments from the U.S. EPA and the Ohio EPA on the draft Treatability Study Work Plan and incorporate responses into the revised work plan.

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

Period Ending January 31, 1992

Operable Unit 5: Environmental Media

5.3 Feasibility Study

a. Status of Work - Key Milestones

The Initial Screening of Alternatives Report will document the initial activities of the Feasibility Study. These activities include the following:

- Develop remedial action objectives.
- Develop general response actions.
- Identify volumes or areas of media to which response actions might be applied.
- Identify and screen technologies.
- Identify and evaluate technology process options.
- Assemble selected representative process options into alternatives.
- Perform an initial screening of alternatives.

A draft Initial Screening of Alternatives document was submitted for internal review and comment on January 22, 1992. While slightly behind baseline schedules, the preparation of this report is proceeding ahead of the Consent Agreement As Amended schedule date. Internal review comments are expected by the end of February.

Activity	Comments
Issue revised Initial Screening of Alternatives to the U.S. EPA by April 16, 1993.	Open, proceeding ahead of schedule.

b. Issues/Problems

None to report.

c. Corrective Actions

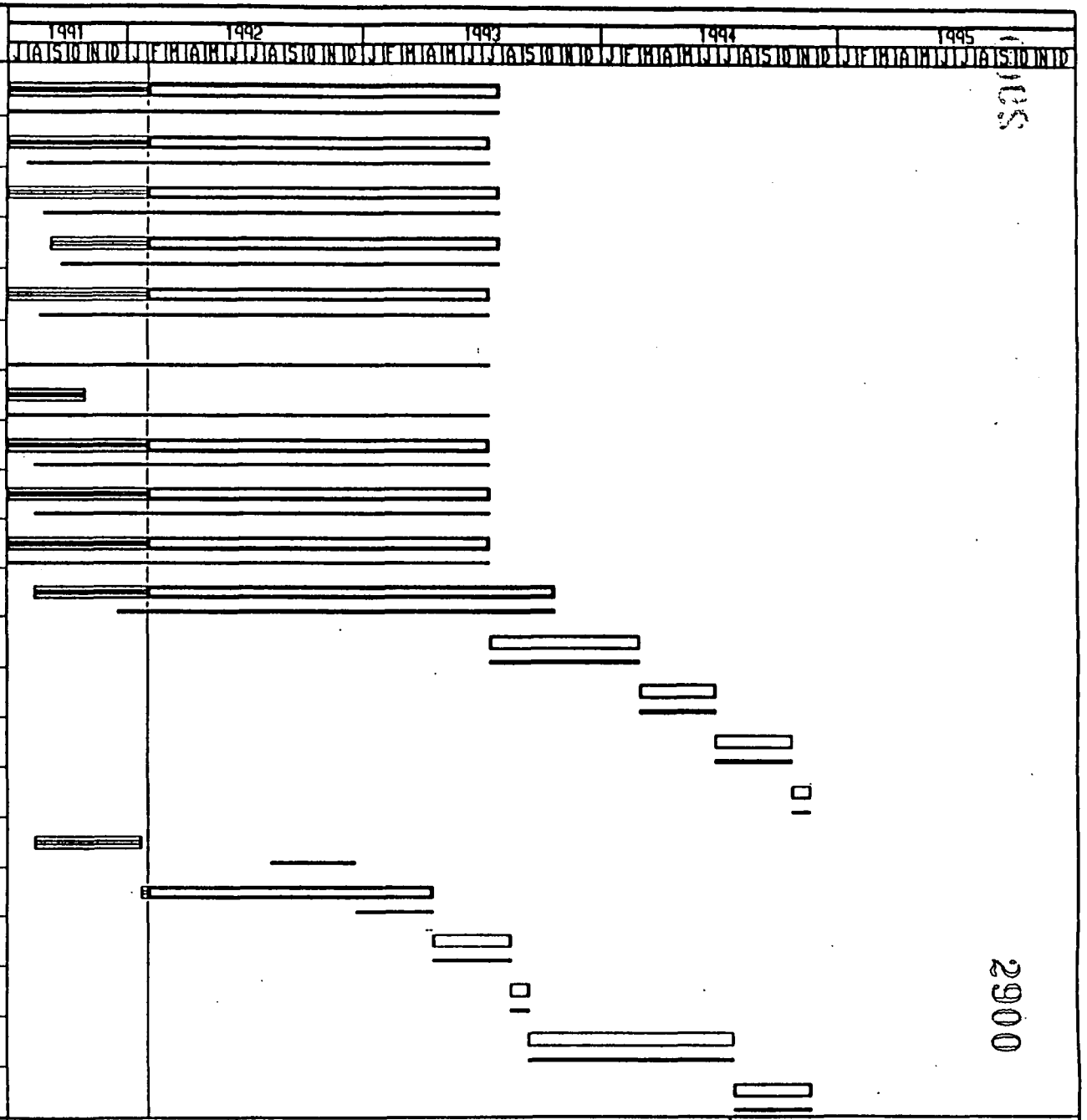
None required.

d. Planned Activities for February 1992

Receive internal review comments on Initial Screening of Alternatives document and initiate preparation of responses.

FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT
Period Ending January 31, 1992

OPERABLE UNIT 5 RELATED FIELD ACTIVITIES AS 10CT90 LF 26JUL93	
FACILITIES TESTING AS 29MAR91 LF 12JUL93	
OU5 FIELD WORK 31 WELL PROGRAM AS 15MAR91 LF 26JUL93	
OU5 FIELD WORK - PADDYS RUN SAMPLING AS 6SEP91 LF 26JUL93	
OU5 FIELD WORK - 8 RCRA WELLS AS 29MAR91 LF 12JUL93	
OU5 FIELD WORK - 6 WELL PROGRAM AS 13JAN91 AF 15MAY91	
OU5 FIELD WORK - WATER LEVEL MEASUREMENTS AS 10CT90 AF 28OCT91	
OU5 FIELD WORK - AUGER SAMPLING AS 1JUL91 LF 12JUL93	
OU5 FIELD WORK - CABLE SAMPLING AS 1JUL91 LF 12JUL93	
OU5 FIELD WORK - MISC. ADDITIONAL WELLS AS 2JAN91 LF 12JUL93	
OU5 TREATABILITY STUDIES AS 12AUG91 LF 20OCT93	
OU5 REMEDIAL INVESTIGATION REPORT PREPARATION LS 13JUL93 LF 25FEB94	
DOE OU5 RI REVIEW/REVISE/APPROVE LS 28FEB94 LF 23JUN94	
EPA OU5 RI REPORT REVIEW/REVISE/APPROVE LS 24JUN94 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	



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

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

Sheet 1 of 2

Prepared by ASI/IT Corp

Date	Revision	Checked	Approved

FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

	1991	1992	1993	1994	1995
	J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
EPA OU5 FS/PP REVIEW/REVISE/APPROVE LS 16NOV94 LF 15MAR95					
PRINT AND DIST FINAL OU5 FS RPT/PP LS 16MAR95 LF 12APR95					
OU5 PUBLIC COMMENT LS 13APR95 LF 3JUL95					
SUBMIT OU5 DRAFT ROD TO EPA LF 2AUG95					
OU5 DRAFT ROD PREPARATION LS 29MAR95 LF 4MAY95					
DOE OU5 DRAFT ROD REVIEW/REVISE/APPROVE LS 4MAY95 LF 2AUG95					

Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

Primavera Systems, Inc. 1984-1991

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

Sheet 2 of 2

Project Start : 10CT90
Project Finish: 19OCT98

Data Date: 2FEB92
Plot Date: 6FEB92

Prepared by ASI/IT Corp.

Date	Revision	Checked	Approved

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

Period Ending January 31, 1992

6.0 RI/FS Community Relations

a. Status of Work

In accordance with the NCP 300.67(b) and the U.S. EPA's Community Relations in Superfund, a Community Relations Plan (CRP) is required for all removal actions if on-site actions are expected to extend beyond 120 days. As proposed in Appendix G of the revised Community Relations Plan -- Remedial Investigation/Feasibility Study and Removal Actions -- Volume III of the Work Plan, the CRP for each removal action will be prepared and added to the original document as an addendum. Each addendum has been assigned a Document Change Request (DCR) number for tracking purposes. The addenda will be submitted to the U.S. EPA for approval. Once approved, they will be added to the Administrative Record and placed in the informational repository at the Public Environmental Information Center. Five addenda have been developed to accommodate the following recent removal actions:

Removal Action No. 1:	Contaminated Water Beneath FEMP Buildings - DCR #75
Removal Action No. 7:	Plant 1 Pad Continuing Release - DCR #76
Removal Action No. 9:	Removal of Waste Inventories and Thorium Management - DCR #77
Removal Action No. 12:	Safe Shutdown - DCR #78
Removal Action No. 10:	Active Fly Ash Pile Controls - DCR #79

All comments and edits for the revision of the Community Relations Plan -- Remedial Investigation/Feasibility Study and Removal Actions -- Volume III of the Work Plan (August 1990) have been incorporated. After the document has undergone internal review and a DCR number has been assigned, the plan will be submitted to the U.S. EPA for approval. This revision and update of the CRP was undertaken without conducting any community assessment interviews.

On January 30, 1992, a technical workshop on uncertainty analysis, hosted by the Centers for Disease Control (CDC), was held at the Sheraton Springdale Hotel in Cincinnati, Ohio. This was the first workshop held by the Radiological Assessment Corporation under the direction of Dr. John Till in connection with the Fernald Dosimetry Reconstruction Project. Approximately 35 people attended. This workshop focused on sources of uncertainty and how quantitative estimates of uncertainty are made. The workshop was intended for those interested in the technical aspects of the project.

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

Period Ending January 31, 1992

6.0 RI/FS Community Relations

a. Status of Work

A Community Roundtable was held January 27, 1992 at the ERA Alpha Building in Ross, Ohio. The subject was "Safe Shutdown."

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for February 1992

The first 1992 RI/FS Community Meeting will be held February 25, 1992 at the Plantation in Harrison, Ohio. The exhibit will open at 6:00 p.m. and the meeting will start at 7:00 p.m.

7.0 Engineered Waste Management Facility

a. Status of Work - Key Milestones

This program will evaluate the ability of the Engineered Waste Management Facility (EWMF) to manage the remedial waste generated by the Operable Units.

The EWMF Sampling and Analysis Plan (SAP) is an addendum to the RI/FS Work Plan (March 1988) and specifies a series of soil sample collection and analytical activities. Geotechnical, geochemical, radiological, and chemical soil samples will be collected and analyzed from 18 geotechnical borings (each approximately 30 feet deep) and eight wells (five 1000-series and three 2000-series) to be installed under this program.

All surface soil samples will receive full radiological and full HSL analyses while, in general, samples collected at mid-stratum of the glacial overburden will receive total uranium and gamma spectral analyses only. The geochemical samples selected for batch absorption 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 will receive geotechnical testing for preliminary engineering purposes. In addition, an on - and off-property National Environmental Policy Act (NEPA) ecological characterization program will be 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 according to the methodology given in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (U.S. EPA 1988).

The formal comment/response document and EWMF SAP (Final, Revision 1) were submitted to the U.S. EPA and the Ohio EPA on January 21, 1992.

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

Period Ending January 31, 1992

7.0 Engineered Waste Management Facility

a. Status of Work - Key Milestones

Eighteen geotechnical borings were completed in January 1992. Installation of seven wells was completed with one well remaining to be installed.

Activity	Comments
Continue SAP geochemical borings. Well installations were completed.	Open, on schedule. Almost completed.
Due to existing soil conditions, five additional geotechnical borings and two wells will be installed for the collection of samples required for supplemental geotechnical engineering and geologic data starting mid-February 1992.	Open.
Continue the surface gamma radiation field measurements.	Completed.
The EWMF SAP, Final, Revision 1 was submitted to the U.S. EPA and the Ohio EPA on January 21, 1992.	Completed. January 26, 1992.
Begin revising EWMF ARARs list based on comments received from the Ohio EPA on January 6, 1992.	Open, awaiting comments from the U.S. EPA.

b. Issues/Problems

Because perched water was encountered at five previous geotechnical borings, an additional five borings will be required. Two additional wells (one 1000-series and one 2000-series) will be required because bedrock was encountered at locations for Wells 1731 and 2731.

On December 6, 1991, access request notification letters were sent to the off-site landowners adjacent to the EWMF study area. This task is complete except for two properties deemed critical for the successful completion of the biological walk-over survey. The DOE/FO is pursuing solutions to this issue.

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

Period Ending January 31, 1992

7.0 Engineered Waste Management Facility (cont'd.)

c. Corrective Actions

The additional geotechnical requirements are identified as changes to the original scope of work. The additional borings and well installations will require approval by the DOE prior to commencement of work.

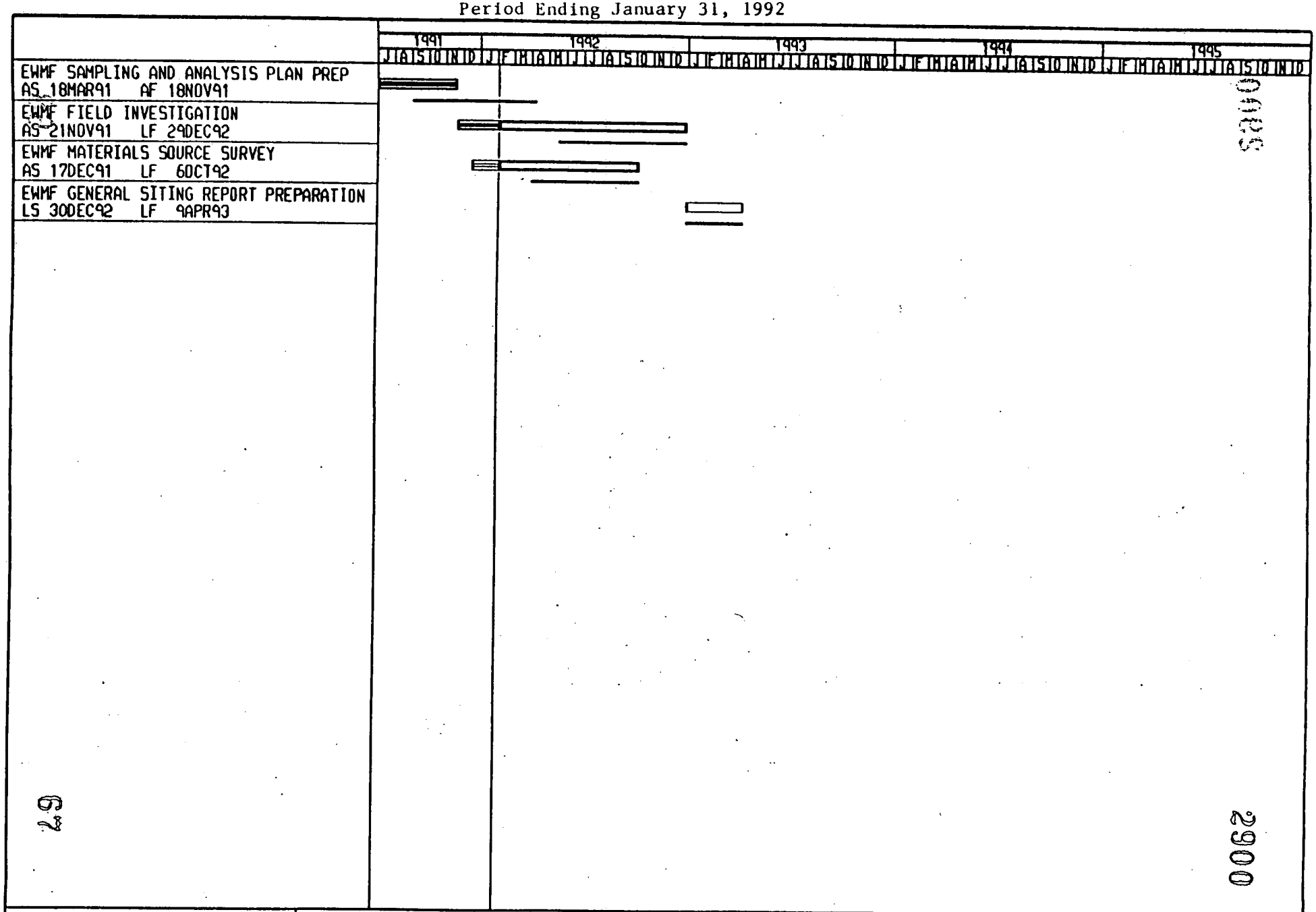
d. Planned Activities for February 1992

Complete the installation of the last well as required in the approved work plan.

After approval, install the additional five borings and two wells.

Continue revision of the ARARs list pending receipt of comments from the U.S. EPA.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT
Period Ending January 31, 1992



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

Primavera Systems, Inc. 1984-1991

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

Project Start : 10CT90
Project Finish: 190CT98

Sheet 1 of 1

Data Date: 2FEB92
Plot Date: 6FEB92

Prepared by ASI/IT Corp

Date	Revision	Checked	Approved

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

Period Ending January 31, 1992

8.0 Site-Wide Characterization Report

a. Status of Work - Key Milestones

Risk Assessment Work Plan Addendum

The Risk Assessment Work Plan Addendum provides a detailed scheme for development and completion of a Baseline Risk Assessment for each operable unit, a Preliminary Baseline Risk Assessment, and a remedial action risk evaluation with each Operable Unit Feasibility Study.

The Risk Assessment Work Plan Addendum presents the specific risk assessment methodology to be followed in the Remedial Investigation/Feasibility Study Risk Assessment task. It also establishes the scope of risk assessment 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 Risk Assessment for each operable unit, the Preliminary Baseline Risk Assessment of the Site-Wide Characterization Report (SWCR), the remedial action risk evaluation, and the comprehensive action risk evaluation for each Operable Unit FS.

Comments on the Risk Assessment Work Plan Addendum were received behind schedule from the U.S. EPA on December 4, 1991. The number of combined comments received from the U.S. EPA and the Ohio EPA was substantial.

Due to the significant quantity of comments, on December 18, 1991, the DOE requested an extension for the submittal of the comment responses and the revised Risk Assessment Work Plan Addendum to the U.S. EPA and the Ohio EPA. The requested date for submittal to the U.S. EPA and the Ohio EPA is February 4, 1992.

Although the extension requested by the DOE does not affect the other dates established for document submittal in the Consent Agreement As Amended, the delay in receipt of comments from the U.S. EPA will affect the schedule for preparation of the SWCR. The magnitude of any schedule slippage for this report has yet to be determined, although a slip of up to 23 days is likely.

8.0 Site-Wide Characterization Report

a. Status of Work - Key Milestones

Risk Assessment Work Plan Addendum (cont'd.)

Draft responses to the U.S. EPA and the Ohio EPA comments on the Risk Assessment Work Plan Addendum were submitted to the U.S. EPA and the Ohio EPA on January 13, 1992. As noted in the draft responses to comments, there were several comments needing resolution between the DOE, the U.S. EPA, and the Ohio EPA prior to revising the Addendum. The following major issues were identified by the DOE after reviewing U.S. EPA and Ohio EPA comments:

- Statistical Treatment of Data
  - terminology to be used
  - determination of background levels
  - methodology for addressing "non-detects"
  - construction of upper tolerance limits
  - methodology for determining chemicals of potential concern
  - methodology for calculation of exposure point concentrations
- Guidance for Ecological Risk Assessments
- Exposure Scenarios
  - RME locations
  - inclusion/exclusion of exposure pathways
  - fate and transport models
  - parameter selection
- Role of the ARARs and Risk-based Levels for Determining Remedial Action Objectives and Preliminary Remediation Goals

Each of these issues was discussed in the January 16, 1992 meeting in Chicago that was attended by the DOE, the U.S. EPA, the Ohio EPA, and their contractors. All the issues were discussed, and most of the 298 specific comments and responses were reviewed and discussed at the meeting and in subsequent informal telephone calls. The responses to comments and the Addendum will be revised in accordance with the agreements made at the January 16 meeting.

3.30 Site-Wide Characterization Report

a. Status of Work - Key Milestones

Risk Assessment Work Plan Addendum (cont'd.)

The revised Addendum will fulfill the requirements of the Consent Agreement As Amended. Additionally, the revised Addendum will present the detailed methodology for performing risk assessment/risk management tasks in the RI/FS to resolve issues raised by the U.S. EPA and the Ohio EPA in their disapproval of the earlier draft. The Addendum will be accompanied by the Response to Comments document to present detailed responses and actions for each of the 298 comments received from the U.S. EPA and the Ohio EPA.

Activity	Comments
Submit revised draft Risk Assessment Work Plan Addendum to the U.S. EPA by February 4, 1992.	Open, on schedule.

Report Preparation

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

Drafts of Chapters 1, 2, and portions of Chapter 3 of the SWCR were prepared and submitted for internal review. Revisions are in progress. Data compilation continued in support of Chapter 4 and the preliminary baseline risk assessment.

A copy of the ASI/IT Biological Sampling Analysis and Resources Report was supplied to the U.S. EPA, as requested at the risk assessment comment resolution meeting on January 16, 1992.

One of the major issues raised at the January 16 meeting was the level of detail to be provided in ecological assessments for the FEMP. This issue will be partially addressed in the Risk Assessment Work Plan Addendum but will also require further discussion between the DOE, the U.S. EPA, and the Ohio EPA.

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

Period Ending January 31, 1992

8.0 Site-Wide Characterization Report

Report Presentation (cont'd.)

Activity	Comments
Submit Site-Wide Characterization Report to the U.S. EPA by August 5, 1992.	Open, impacted by 23-day delay in receipt of the U.S. EPA comments on Risk Assessment Work Plan Addendum and difficulties in retrieving data from the RI/FS data base.

b. **Issues/Problems**

Delay in receipt of U.S. EPA comments on the Risk Assessment Work Plan Addendum may delay delivery of the SWCR to the U.S. EPA.

The U.S. EPA and the Ohio EPA have expressed concerns about the level of detail to be provided in ecological assessments for the FEMP. Potential schedule impacts are unclear at this time, but requirements for additional detail and/or field studies could affect delivery of the SWCR or subsequent RI reports.

c. **Corrective Actions**

Notify the U.S. EPA of the potential delay.

Prepare briefing on ecological studies at the FEMP for the U.S. EPA and the Ohio EPA to resolve ecological assessment issues.

Resolve problems with data retrieval to prevent further schedule impact.

d. **Planned Activities for February 1992**

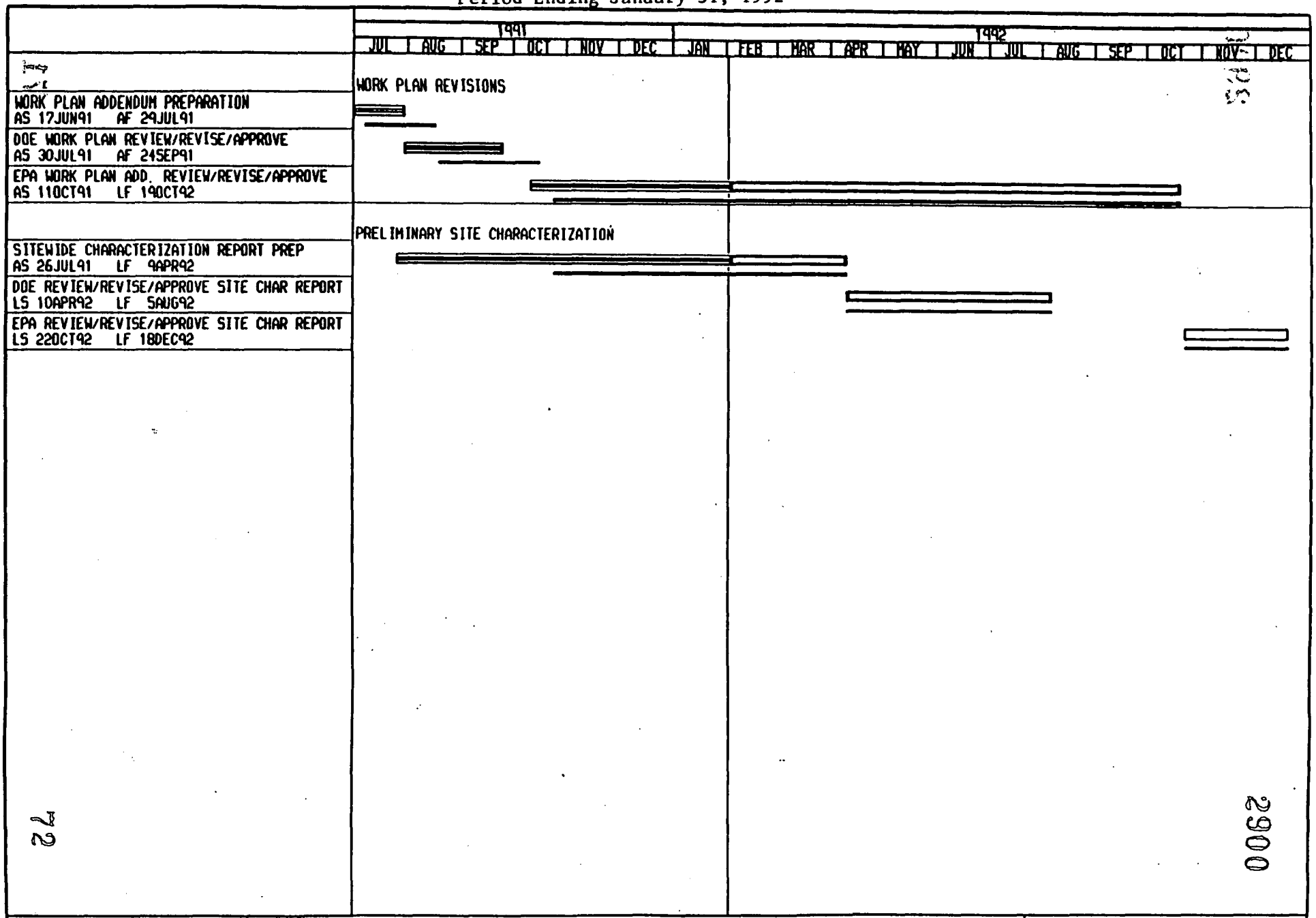
Continue data compilation in support of modeling and data summaries.

Submit revised Risk Assessment Work Plan Addendum to the U.S. EPA and the Ohio EPA on February 4, 1992.

Prepare briefing on ecological assessment at the FEMP for the U.S. EPA and the Ohio EPA.

Resolve problems with data retrieval

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT
Period Ending January 31, 1992



Activity Bar/Late Dates
Critical Activity
Progress Bar
Target Dates as of 10CT90

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

Sheet 1 of 1

Prepared by ASI/II Corp.

Date	Revision	Checked	Approved

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

PERIOD ENDING JANUARY 31, 1992

ENCLOSURE A

WASTEWATER FLOWS AND RADIONUCLIDE CONCENTRATIONS UNDER CA SECTION XXIII.B

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 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 January 1992.

Summary - January 1992

The total quantity of uranium discharged from the FEMP to the Great Miami River via Manhole 175 (Outfall 1I000004001) was 65.91 kilograms. The average uranium concentration for the previous 12 months was 0.76 mg/l. This is 85.4 percent of the Derived Concentration Guide (DOE Order 5400.5) for dischargeable offsite water.

There was no discharge from the Stormwater Retention Basin (Outfall 1I000004002) to Paddy's Run via the Storm Sewer Outfall Ditch in January 1992. Based on 1.94 inches of rainfall in January 1992, the total quantity of uranium discharged to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 8.73 kilograms.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

Wastewater Flows and Radionuclide Concentrations

FACILITY: Fernald Environmental Management Project, U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton
9002 M 9501 900212

LOCATION: 1I000004001; 001 Total Discharge
Manhole 175 (Effluent to Great Miami River)

MONTH: January 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	0.233	477	203	0.72	0.63	243
2	0.572	369	117	0.56	1.21	189
3	1.389	419	72	0.78	4.10	264
4	1.209	414	131	0.94	4.30	318
5	0.790	437	90	0.88	2.63	297
6	0.398	613	180	0.88	1.32	297
7	0.417	581	198	1.14	1.80	385
8	1.164	640	198	1.02	4.49	345
9	0.814	523	257	1.12	3.45	378
10	0.445	680	243	1.08	1.82	365
11	0.366	568	135	1.16	1.61	392
12	0.304	545	90	1.12	1.29	378
13	0.414	495	122	1.02	1.60	345
14	0.969	698	207	1.12	4.11	378
15	0.405	568	108	0.92	1.41	311
16	0.410	1378	356	2.64	4.09	892
17	0.447	1649	550	3.30	5.58	1115
18	0.374	1676	482	2.40	3.40	811
19	0.350	635	189	1.44	1.91	486
20	0.726	342	63	0.38	1.04	128
21	0.877	230	86	0.32	1.06	108
22	1.019	194	131	0.32	1.23	108
23	0.568	185	243	0.32	0.69	108
24	1.078	329	126	0.58	2.37	196
25	0.817	221	131	0.52	1.61	176
26	0.272	365	68	0.46	0.47	155
27	0.381	257	113	0.46	0.66	155
28	0.405	473	63	0.68	1.04	230
29	0.428	509	288	0.90	1.46	304
30	0.459	640	545	1.20	2.08	405
31	0.427	509	378	0.90	1.45	304
	18.927				65.91	

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

Wastewater Flows and Radionuclide Concentrations (cont'd.)

FACILITY: Fernald Environmental Management Project

LOCATION: 001 Total Discharge

MONTH: January 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.	0.611	515	180	0.92	2.13	311
Max.	1.389	1676	550	3.30	5.58	1115
Min.	0.233	185	63	0.32	0.47	108

The average uranium concentration for the previous 12 months was 0.76 mg/l. This is 85.4 percent of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

Comments: (1) The calculated total U-238 is based on a conversion factor of 337.84 pCi U-238/mg Total U applied to the measured value of total uranium.

(2) Average values presented are flow-weighted.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

Wastewater Flows and Radionuclide Concentrations (cont'd.)

FACILITY: Fernald Environmental Management Project, U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton
9002 M 9501 900212

LOCATION: 1I000004002, 002 Discharge (Overflow) to Storm Sewer Outfall Ditch Stormwater Retention Basin Spillway (Effluent to Paddy's Run)

MONTH: January 1992

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

Based on 1.94 inches of rainfall in January 1992, the uranium discharge to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 8.73 kgs.

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

PERIOD ENDING JANUARY 31, 1992

ENCLOSURE B

FFCA: INITIAL REMEDIAL MEASURES AND OTHER OPEN ACTIONS

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

INTRODUCTION

Enclosure B describes actions undertaken at the FEMP during the period January 1 through January 31, 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, Section 1.0, Site Characterization.

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 MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

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

3. Reports and Record Keeping

Section B

The RI/FS Monthly Technical Progress Report for December 1991 was transmitted to the U.S. EPA on January 21, 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 twentieth Quarterly Particulate Emissions Report for the period July 1, 1991 through September 30, 1991 was submitted to the U.S. EPA on November 19, 1991.

RADIATION DISCHARGE INFORMATION

Section A

The twentieth Quarterly Liquid Discharge Report for the period July through September 1991 was submitted to the U.S. EPA on November 19, 1991.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

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

REPORTING REQUIREMENTS

Section B

The Federal Facility Compliance Agreement Monthly Progress Report for December 31, 1991 was transmitted to the U.S. EPA on January 21, 1992 as Enclosure B of the Consolidated Consent Agreement/Federal Facility Compliance Agreement (CA/FFCA) Monthly Progress Report.

TABLE 1

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

STATUS OF ACTIONS AS OF JANUARY 31, 1992

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY92 STATUS
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 rad emissions from the K-65 Silos are being reported separate under Section IX-Removal Actions of the Conse 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 accordance with the requirements of Section X of the Conse Agreement As Amended under CERCLA Sections 120 and 106(
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 accordance with the requirements of Section X of the Conse Agreement As Amended under CERCLA Sections 120 and 106(
2.F	Implement tasks described in the approved RI/FS Work Plan.		Status information on the RI/FS is being reported accordance with the requirements of Section X of the Conse Agreement As Amended under CERCLA Sections 120 and 106(
3.	REPORTS AND RECORD KEEPING		
3.B	Submit monthly RI/FS progress reports.	monthly	The RI/FS Monthly Progress Report for December 1991 transmitted to the U.S. EPA on January 21, 1992 (DOE-7 92).
CLEAN AIR ACT			
B.4	Prepare annual progress report on installation and replacement of emission control devices.	yearly	The Third Annual Progress Report on the installation replacement of emission control devices was transmitted the U.S. EPA on February 8, 1991 (DOE-708-91).
C.	Provide annual reports to U.S. EPA per 40 CFR 61.94(c).	yearly	The Annual NESHAP Compliance Report for CY 1990 transmitted to the U.S. EPA on June 25, 1991 (DOE-1537-9
D.1	Provide U.S. EPA with yearly stack-testing schedule.	yearly	The 1989 stack testing schedule was transmitted to the U EPA on June 16, 1989. A letter (DOE-1615-89) transmitted to the U.S. EPA on September 15, 1989 indicat that, due to the uncertainty concerning resumption production at the FEMP, the 1989 FFCA Stack Testing Prog was being deferred. In August 1991, the DOE confirmed t no further production would take place at the facility, renamed the facility the FEMP. Some stack operations expected when waste processing operations are resumed. U.S. EPA will be provided with notification of future st testing dates when operating schedules are formulated.

TABLE 1

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

STATUS OF ACTIONS AS OF JANUARY 31, 1992

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY92 STATUS
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.	quarterly	The twentieth Quarterly Particulate Emissions Report for the period July 1, 1991 through September 30, 1991 was submitted to the U.S. EPA November 19, 1991 (DOE-370-92). The nineteenth Quarterly Particulate Emissions Report for the period April 1, 1991 through June 30, 1991 was transmitted to the U.S. EPA on August 30, 1991. (DOE-2120-91).
RCRA			
A.1	Conduct a hazardous waste determiniation 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.
A.2	Commence a hazardous waste analysis program for materials in the landfill and going to the incinerator.	30 days	Complete. Operations 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 the date the last TSD unit is closed.

TABLE 1

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

STATUS OF ACTIONS AS OF JANUARY 31, 1992

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY92 STATUS
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.	quarterly	The twentieth Quarterly Liquid Discharge Report for period July through September 1991 was transmitted to U.S. EPA on November 19, 1991 (DOE-370-92). The ninetee Quarterly Liquid Discharge Report for the period Ap through June 1991 was transmitted to the U.S. EPA on Aug 30, 1991 (DOE-2120-91).
REPORTING REQUIREMENTS			
B.	Issue monthly progress report of actions taken to ensure compliance with FFCA requirements.	monthly	December's FFCA Monthly Progress Report was transmitted the U.S. EPA on January 21, 1992 (DOE-708-92).

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

PERIOD ENDING JANUARY 31, 1992

ENCLOSURE C

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

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

Period Ending January 31, 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 undertaken at the FEMP during the period January 1 through January 31, 1992 to implement Part V, Radon-222 Control and Abatement Plan, paragraphs 19-33 of the FFA.

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 January 31, 1992

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
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 Achieveable (ALARA) with the goal as specified in the Silos 1 and 2 Removal Action Work Plan.	None specified.	The Bentonite Effectiveness Environmental Monitoring Plan was submitted to the U.S. EPA on 1/27/92.
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 submitted to the U.S. EPA for comment and approval on 1/27/92.
Part V, 23	Evaluate performance of the removal action and determine whether or not additional actions are needed prior to final remediation.	None specified.	Proposed methodology for estimating radon-222 concentration reduction submitted to U.S. EPA per paragraph 20 of Part V.

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
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 newly discovered radon-222 emission sources.	None specified.	No information to report for January 1992.
Part V, 26	Directly measure radon-222 flux from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell.	None specified.	No information to report for January 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 January 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 January 1992. A package including previous estimated Radon-222 emissioins from Silo 3 is being prepared for transmittal.

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

Period Ending January 31, 1992

FFA Part, Paragraph(s)	Description of Commitment	FFA Due Date	Status of Commitment
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 U.S. EPA response pursuant to paragraph 29.	None required.
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.	Initial 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 January 31, 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 Silos 1 and 2 headspace humidity data is not available at this time. Instrumentation and the associated monitoring equipment is being installed as part of the data logging system upgrade. In the future, these data will be collected automatically).

The radon silo headspace data submitted for this reporting period has been collected manually since the completion of the bentonite installation. An automated data logging system is currently being installed. After installation of the data logging system is completed, these data will also 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 (K65 NW, K65 SW, K65 NE, K65 SE). Figure C-6, immediately following, identifies the sampling locations.

Minimum and maximum values are based on the lowest and highest hourly values that were recorded and incorporated into the daily averages.

REAL-TIME RADON MONITORING LOCATIONS

February, 1991 Background offsite - Hamilton

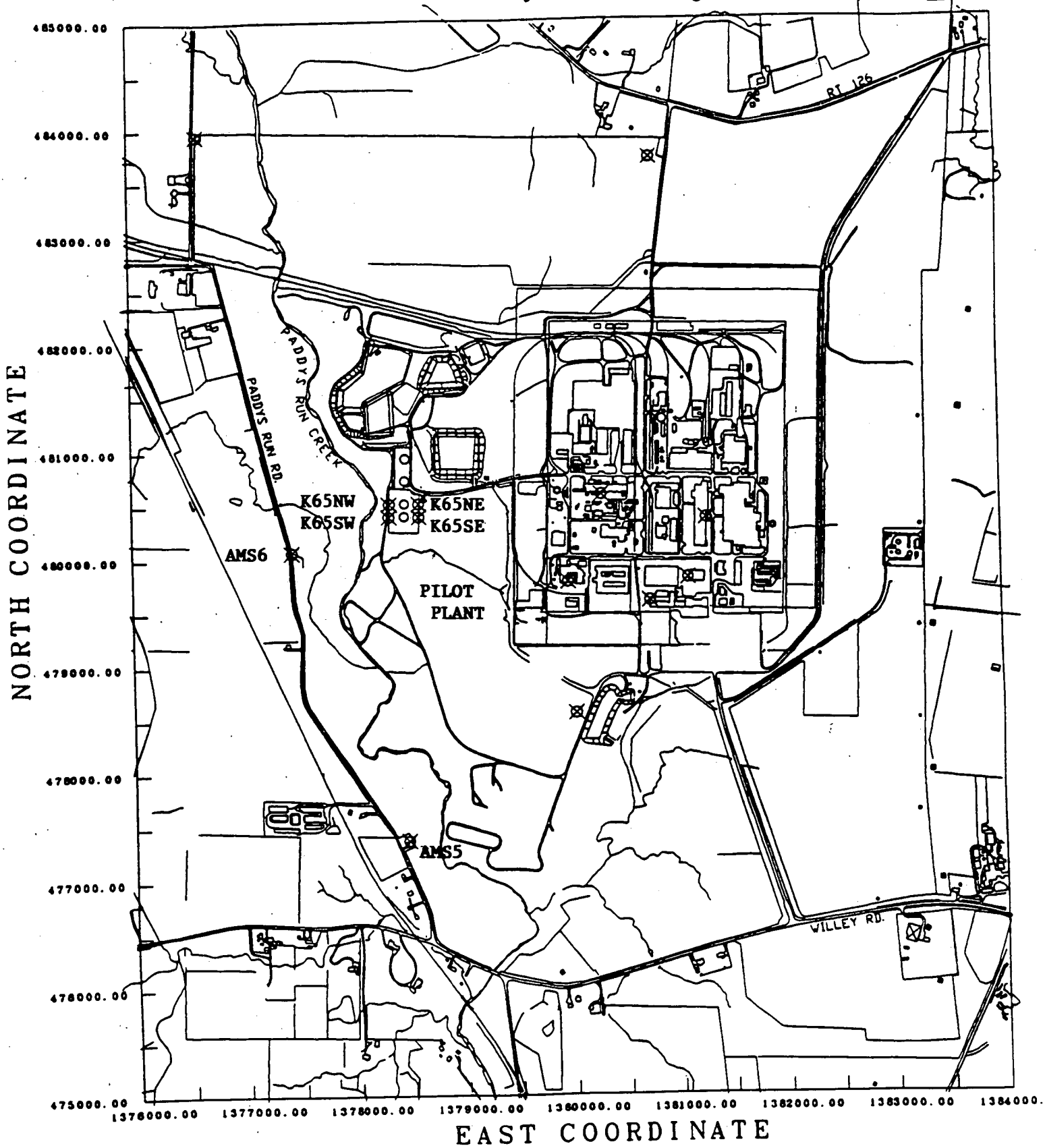

Figure C-6

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

Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo # 1 DATE: OCTOBER 1991

Day	Ambient Temp Deg. F	Ambient Pres In. Hg.	Temperature Head Space Deg. F	Inter Hum. %	Diff. Pres In. HG	Head Sp Radon (pCi/l)
1	65.8	29.7	64.9		-0.002	
2	65.1	29.6	65.0	D	-0.002	D
3	65.0	29.5	65.4	A	-0.001	A
4	67.4	29.5	65.3	T	-0.003	T
5	*	*	*	A	*	A
6	*	*	*		*	
7	45.0	29.8	61.8	N	-0.007	N
8	50.1	29.8	61.1	O	-0.006	O
9	60.0	29.7	61.4	T	-0.003	T
10	58.3	29.6	62.0		-0.021	
11	54.1	29.3	61.7	C	-0.005	C
12	49.8	29.4	60.9	U	-0.006	U
13	46.1	29.7	60.3	R	-0.006	R
14	50.0	29.4	59.8	R	-0.007	R
15	45.5	29.4	59.3	E	-0.007	E
16	41.5	29.7	58.6	N	-0.007	N
17	46.9	29.7	58.0	T	-0.006	T
18	57.6	29.7	58.3	L	-0.004	L
19	52.2	29.8	59.0	Y	-0.006	Y
20	*	*	*		*	
21	56.4	29.6	57.3	C	-0.004	C
22	57.6	29.7	57.4	O	-0.004	O
23	*	*	*	L	*	L
24	62.3	29.7	59.0	L	-0.004	L
25	66.5	29.7	59.5	E	-0.003	E
26	*	*	*	C	*	C
27	*	*	*	T	*	T
28	62.1	29.8	61.3	E	-0.003	E
29	67.4	29.8	61.2	D	-0.002	D
30	65.3	29.8	61.6		-0.003	
31	61.2	29.7	61.6		-0.004	
ARITHMETIC MEAN	62.8	29.7	62.1		-0.004	
MAXIMUM	87.0	29.9	66.9		0.031	
MINIMUM	24.6	29.2	57.0		-0.137	
MEDIAN	57.6	29.7	61.4		-0.004	

Note: * - Data not Available

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FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo #1 DATE: NOVEMBER 1991

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	55.2	29.4	61.0		-0.009	3.00E+07**
2	37.1	29.7	59.6	D	-0.009	
3	28.1	29.9	58.5	A	-0.007	
4	23.0	30.0	57.4	T	-0.006	
5	26.3	29.9	56.5	A	-0.004	
6	40.9	29.7	56.5		-0.005	
7	29.3	29.8	56.3	N	-0.004	
8	23.9	30.0	55.4	O	-0.004	
9	24.5	30.0	54.6	T	-0.004	
10	29.5	29.7	54.2		-0.004	
11	38.4	29.7	54.2	C	-0.004	
12	*	*	*	U	*	
13	*	*	*	R	*	
14	57.1	29.7	54.0	R	-0.005	
15	51.7	29.7	54.4	E	-0.007	
16	54.3	29.7	54.7	N	-0.005	
17	49.9	29.7	54.5	T	-0.005	
18	59.7	29.6	54.6	L	-0.008	
19	64.7	29.6	55.3	Y	-0.006	
20	65.2	29.5	55.9		-0.006	
21	52.5	29.6	56.1	C	-0.005	
22	50.8	29.5	55.8	O	-0.005	
23	*	*	*	L	*	
24	29.8	29.6	54.2	L	-0.008	
25	21.9	29.8	53.1	E	-0.004	
26	22.1	30.0	52.6	C	-0.003	
27	39.0	29.8	53.1	T	-0.006	
28	49.5	29.7	53.7	E	-0.008	
29	62.9	29.7	54.1	D	-0.008	
30	59.1	29.6	54.8		-0.008	
31						
ARITHMETIC MEAN	42.5	29.7	56.2		-0.006	3.00E+07
MAXIMUM	73.0	30.1	61.6		0.028	3.00E+07
MINIMUM	6.8	29.2	52.0		-0.081	3.00E+07
MEDIAN	40.9	29.7	54.8		-0.005	3.00E+07

** This headspace data was derived from headspace samples taken in 1987. This number is used for comparison as the pre-bentonite radon concentration in a silo headspace.

Note: * - data not available Head Space Radon is a grab sample

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Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo # 1 DATE: DECEMBER 1991

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	39.0	29.7	54.1		-0.008	
2	37.3	29.5	53.2	D	-0.018	
3	35.2	29.3	52.5	A	0.021	1.89E+05
4	19.8	29.5	52.1	T	-0.011	
5	•	*	•	A	0.000	1.40E+05
6	•	*	•		0.000	1.43E+05
7	•	•	•	N	0.000	
8	•	•	•	O	0.000	
9	41.4	29.6	52.1	T	-0.008	1.41E+05
10	32.0	29.7	51.3		-0.009	1.43E+05
11	39.2	29.8	50.6	C	-0.008	
12	49.9	29.6	50.8	U	-0.006	
13	53.2	29.5	51.5	R	-0.006	
14	41.2	29.6	51.7	R	-0.009	
15	28.8	29.8	50.7	E	-0.011	
16	24.9	29.9	49.7	N	-0.010	
17	39.3	29.6	49.3	T	-0.009	
18	24.7	29.2	48.9	L	-0.012	1.36E+05
19	16.8	30.4	48.0	Y	-0.011	
20	•	*	•		•	1.24E+05
21	•	•	•	C	•	1.26E+05
22	•	•	•	O	•	1.43E+05
23	•	•	•	L	•	
24	•	•	•	L	•	
25	•	•	•	E	•	
26	•	•	•	C	*	
27	*	•	•	T	•	
28	•	•	•	E	*	
29	*	•	•	D	•	
30	31.9	29.9	47.1		-0.009	
31	36.1	30.0	47.0		-0.009	
ARITHMETIC MEAN	34.7	29.7	50.6		-0.008	1.43E+05
MAXIMUM	62.1	30.4	54.5		0.120	1.89E+05
MINIMUM	4.0	13.1	46.9		-0.070	1.24E+05
MEDIAN	36.7	29.65	50.75		-0.009	1.42E+05

Note: • - data not available Head Space Radon is a grab sample

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FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

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Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo # 1 DATE: JANUARY 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	36.6	30.0	47.0		-0.008	
2	38.5	29.7	46.9	D	-0.009	
3	46.1	29.5	47.3	A	-0.011	
4	42.6	29.6	47.7	T	0.013	
5	37.0	29.6	47.6	A	-0.009	
6	36.8	29.6	47.5		-0.009	
7	•	*	•	N	•	1.57E+05
8	•	•	•	O	•	
9	*	*	*	T	•	1.58E+05
10	•	*	•		*	1.51E+05
11	•	•	•	C	•	
12	•	•	*	U	•	
13	46.5	29.1	46.5	R	-0.006	1.57E+05
14	30.9	29.1	46.5	R	0.123	
15	20.2	29.6	45.7	E	0.060	
16	6.3	29.8	44.3	N	-0.029	
17	26.8	29.5	43.7	T	-0.017	
18	15.6	29.9	43.3	L	0.046	
19	11.4	29.6	42.1	Y	-0.032	
20	29.0	29.6	42.1		-0.008	
21	34.0	29.6	42.3	C	-0.036	
22	38.2	30.0	42.7	O	-0.008	
23	41.0	29.1	43.5	L	-0.008	
24	22.6	29.5	43.3	L	-0.012	
25	27.8	29.6	42.7	E	-0.010	
26	27.9	30.0	42.5	C	-0.010	
27	24.5	29.9	42.3	T	-0.010	
28	•	*	•	E	*	
29	•	*	•	D	•	
30	*	*	•		•	
31	•	*	•		•	
ARITHMETIC MEAN	30.5	29.6	44.5		0.001	1.55E+05
MAXIMUM	57.7	39.6	47.8		0.406	1.58E+05
MINIMUM	-7.1	22.9	41.7		-0.255	1.51E+05
MEDIAN	30.4	29.6	43.7		-0.009	1.57E+05

Note: * - data not available Head Space Radon is a grab sample

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

Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo # 2 DATE: OCTOBER 1991

Day	Ambient Temp Deg. F	Ambient Pres In. Hg.	Temperature Head Space Deg. F	Inter Hum. %	Diff. Pres In. HG	Head Sp Radon (pCi/l)
1	65.8	29.7	64.4		0.001	
2	65.1	29.6	64.6	D	-0.009	D
3	65.0	29.5	64.7	A	-0.009	A
4	67.4	29.5	64.8	T	-0.009	T
5	*	*	*	A	*	A
6	*	*	*		*	
7	45.0	29.8	62.2	N	-0.004	N
8	50.1	29.8	61.3	O	-0.008	O
9	60.0	29.7	61.6	T	-0.008	T
10	58.3	29.6	62.2		-0.020	
11	54.1	29.3	61.8	C	-0.008	C
12	49.8	29.4	61.4	U	-0.008	U
13	46.1	29.7	61.1	R	-0.008	R
14	50.0	29.4	60.8	R	-0.008	R
15	45.5	29.4	60.5	E	-0.007	E
16	41.5	29.7	60.0	N	-0.007	N
17	46.9	29.7	59.9	T	-0.008	T
18	57.6	29.7	59.8	L	-0.008	L
19	52.2	29.8	60.2	Y	-0.008	Y
20	*	*	*		*	
21	56.4	29.6	59.0	C	-0.007	C
22	57.6	29.7	59.1	O	-0.007	O
23	*	*	*	L	*	L
24	62.3	29.7	59.9	L	-0.012	L
25	66.5	29.7	60.2	E	0.014	E
26	*	*	*	C	*	C
27	*	*	*	T	*	T
28	62.1	29.8	61.2	E	-0.009	E
29	67.4	29.8	61.1	D	-0.008	D
30	65.3	29.8	61.5		-0.008	
31	61.2	29.7	61.4		-0.008	
ARITHMETIC MEAN	54.8	29.9	62.5		-0.007	
MAXIMUM	87.0	29.9	65.2		0.095	
MINIMUM	24.6	29.2	58.7		-0.117	
MEDIAN	57.6	29.7	61.2		-0.009	

Note: * - Data not Available

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

Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo #2 DATE: NOVEMBER 1991

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	55.2	29.4	61.1		-0.006	2.50E+07**
2	37.1	29.7	59.5	D	-0.008	
3	28.1	29.9	57.4	A	-0.010	** This head-
4	23.0	30.0	55.5	T	-0.011	space data was
5	26.3	29.9	53.9	A	-0.010	derived from
6	40.9	29.7	53.5		-0.009	headspace sam-
7	29.3	29.8	53.2	N	-0.011	ples taken in
8	23.9	30.0	51.2	O	-0.010	1987. This
9	24.5	30.0	50.2	T	-0.010	number is used
10	29.5	29.7	49.6		-0.009	for comparison
11	38.4	29.7	48.6	C	-0.009	as the pre-ben-
12	•	*	•	U	•	tonite radon
13	•	•	*	R	•	concentration
14	57.1	29.7	49.9	R	-0.005	in a silo
15	51.7	29.7	50.7	E	-0.006	headspace.
16	54.3	29.7	51.7	N	-0.005	
17	49.9	29.7	51.4	T	-0.006	
18	59.7	29.6	51.6	L	-0.004	
19	64.7	29.6	53.7	Y	-0.003	
20	65.2	29.5	54.8		-0.004	
21	52.5	29.6	56.2	C	-0.006	
22	50.8	29.5	57.1	O	-0.008	
23	•	•	*	L	•	
24	29.8	29.6	55.5	L	-0.011	
25	21.9	29.8	54.2	E	-0.011	
26	22.1	30.0	52.8	C	-0.011	
27	39.0	29.8	52.2	T	-0.009	
28	49.5	29.7	52.6	E	-0.007	
29	62.9	29.7	53.3	D	-0.005	
30	59.1	29.6	54.2		-0.006	
31						
ARITHMETIC MEAN	42.5	29.7	53.5		-0.008	2.50E+07
MAXIMUM	73.0	30.1	65.1		0.002	2.50E+07
MINIMUM	6.8	29.2	45.6		-0.019	2.50E+07
MEDIAN	40.9	29.7	53.3		-0.008	2.50E+07

Note: • - data not available Head Space Radon is a grab sample

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

Period Ending January 31, 1992

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

K-65 Silos Report

LOCATION: Silo # 2 DATE: DECEMBER 1991

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	39.0	29.7	54.3		-0.005	
2	37.3	29.5	53.3	D	-0.006	
3	35.2	29.3	52.5	A	0.062	1.38E+05
4	19.8	29.5	52.1	T	0.386	
5	•	•	•	A	*	1.39E+05
6	•	•	*		•	1.41E+05
7	•	*	•	N	•	
8	•	•	•	O	•	
9	41.4	29.6	52.0	T	-0.005	1.40E+05
10	32.0	29.7	51.3		-0.004	1.44E+05
11	39.2	29.8	50.5	C	-0.005	
12	49.9	29.6	50.6	U	-0.005	
13	53.2	29.5	51.3	R	-0.000	
14	41.2	29.6	51.4	R	0.028	
15	28.8	29.8	50.3	E	-0.006	
16	24.9	29.9	49.3	N	-0.004	
17	39.3	29.6	49.0	T	-0.005	
18	24.7	29.2	48.6	L	-0.005	1.20E+05
19	16.8	30.4	47.6	Y	-0.003	
20	•	•	•		•	1.12E+05
21	•	•	•	C	•	1.37E+05
22	•	•	•	O	•	1.39E+05
23	•	•	•	L	*	
24	•	•	•	L	•	
25	•	•	•	E	*	
26	•	•	•	C	•	
27	•	•	*	T	•	
28	•	•	•	E	•	
29	•	•	*	D	*	
30	31.9	29.9	46.6		-0.004	
31	36.1	30.0	46.5		-0.004	
ARITHMETIC MEAN	34.7	29.7	50.4		0.024	1.34E+05
MAXIMUM	62.1	30.4	54.8		0.387	1.44E+05
MINIMUM	4.0	13.1	46.5		-0.061	1.12E+05
MEDIAN	36.7	29.65	50.6		-0.004	1.39E+05

Note: • - data not available Head Space Radon is a grab sample

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

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Period Ending January 31, 1992

2900

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

K-65 Silos Report

LOCATION: Silo # 2 DATE: JANUARY 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	36.6	30.0	46.5		-0.004	
2	38.5	29.7	46.4	D	-0.004	
3	46.1	29.5	46.9	A	-0.005	
4	42.6	29.6	47.3	T	-0.005	
5	37.0	29.6	47.1	A	-0.005	
6	36.8	29.6	47.1		-0.004	
7	*	*	*	N	*	1.37E+05
8	*	*	*	O	*	
9	*	*	*	T	*	1.46E+05
10	*	*	*		*	1.32E+05
11	*	*	*	C	*	
12	*	*	*	U	*	
13	46.5	29.1	46.2	R	-0.004	1.45E+05
14	30.9	29.1	46.2	R	0.256	
15	20.2	29.6	45.3	E	0.363	
16	6.3	29.8	44.1	N	0.235	
17	26.8	29.5	43.5	T	-0.060	
18	15.6	29.9	43.1	L	0.305	
19	11.4	29.6	42.0	Y	0.063	
20	29.0	29.6	42.0		-0.059	
21	34.0	29.6	42.2	C	-0.002	
22	38.2	30.0	42.7	O	-0.003	
23	41.0	29.1	43.4	L	-0.004	
24	22.6	29.5	43.1	L	-0.004	
25	27.8	29.6	42.5	E	-0.003	
26	27.9	30.0	42.3	C	-0.003	
27	24.5	29.9	42.1	T	-0.002	
28	*	*	*	E	*	
29	*	*	*	D	*	
30	*	*	*		*	
31	*	*	*		*	
ARITHMETIC MEAN	30.5	29.6	44.4		0.050	1.40E+05
MAXIMUM	57.7	39.6	47.4		0.392	1.46E+05
MINIMUM	-7.1	22.9	41.6		-0.253	1.32E+05
MEDIAN	30.4	29.6	43.1		-0.004	1.41E+05

Note: * - data not available Head Space Radon is a grab sample

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001

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

2900

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations MONTH: OCTOBER 1991

Day	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PILOT PLANT (pCi/L)	BKGRD (pCi/L)
1	1.8	1.4	2.5	1.1
2	1.8	1.2	2.3	1.0
3	1.7	1.2	2.2	0.9
4	0.8	0.7	1.5	0.5
5	0.5	0.5	0.7	0.4
6	0.6	0.5	0.9	0.5
7	1.6	1.2	2.6	0.7
8	1.7	1.4	2.2	1.0
9	1.3	1.1	1.5	0.9
10	0.8	0.7	1.1	0.7
11	1.4	1.2	1.5	0.9
12	1.7	1.3	2.1	1.0
13	1.7	1.4	1.8	0.8
14	1.6	1.4	2.8	0.7
15	1.3	1.1	1.9	0.9
16	1.5	1.2	1.9	0.8
17	2.5	1.5	2.6	1.1
18	•	1.4	2.1	1.1
19	*	0.6	1.1	0.6
20	•	1.8	3.1	1.1
21	1.4	2.0	4.0	1.4
22	2.5	1.9	2.5	1.4
23	2.3	1.7	2.2	0.9
24	1.1	1.0	1.4	0.7
25	0.9	0.7	1.0	0.6
26	1.2	1.1	1.0	1.0
27	0.7	0.7	0.7	0.5
28	0.6	1.1	0.8	0.6
29	1.1	1.1	1.1	0.8
30	2.2	2.0	1.8	1.2
31	1.3	1.4	1.2	1.0
AVERAGE	1.4	1.2	1.8	0.9
MAXIMUM	5.9	4.7	11.2	2.7
MINIMUM	0.1	0.2	0.3	0.1
MEDIAN	1.4	1.2	1.8	0.9

• - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations MONTH: NOVEMBER 1991

Day	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PILOT PLANT (pCi/L)	BKGRD (pCi/L)
1	0.8	1.4	0.8	0.6
2	0.4	0.5	1.1	0.5
3	0.4	0.5	1.5	0.4
4	0.7	0.8	2.4	0.6
5	1.1	1.2	0.9	0.9
6	0.5	0.5	0.9	0.5
7	0.7	0.6	1.1	0.7
8	1.0	0.7	1.1	1.0
9	1.9	1.5	2.2	1.2
10	2.0	1.7	2.7	0.6
11	1.2	0.9	1.4	0.9
12	1.6	1.4	1.9	0.5
13	0.6	0.5	0.8	1.2
14	2.0	1.6	2.2	1.1
15	0.9	0.7	0.8	0.8
16	1.1	0.8	0.8	0.6
17	0.8	0.8	0.7	0.5
18	0.8	0.6	0.7	0.5
19	0.4	0.4	0.5	0.4
20	0.3	0.4	0.5	0.4
21	0.7	0.7	0.8	0.6
22	1.4	1.2	1.1	0.8
23	1.5	1.2	2.0	0.7
24	0.3	0.4	0.7	0.4
25	0.9	0.7	1.4	0.7
26	1.9	1.5	2.0	1.0
27	0.7	0.7	1.0	0.6
28	0.5	0.6	0.6	0.5
29	0.3	0.3	0.4	0.4
30	0.3	0.4	0.5	0.4
AVERAGE	0.9	0.8	1.2	0.7
MAXIMUM	4.7	5.9	7.7	2.6
MINIMUM	0.2	0.1	0.1	0.2
MEDIAN	0.8	0.7	1.0	0.6

* - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations MONTH: DECEMBER 1991

Day	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PLANT (pCi/L)	BKGRD (pCi/L)
1	0.4	0.4	0.5	0.4
2	0.5	0.6	0.7	0.5
3	0.4	0.4	0.7	0.5
4	0.4	0.6	0.9	0.6
5	0.3	0.4	0.5	0.5
6	0.6	0.5	0.6	0.6
7	0.3	0.4	•	0.4
8	0.3	0.3	•	0.4
9	0.6	0.5	0.8	0.6
10	1.0	1.0	1.1	0.9
11	1.5	1.3	1.4	1.1
12	1.1	1.1	1.0	0.7
13	0.5	0.5	0.6	0.6
14	0.3	0.4	0.6	0.4
15	0.3	0.4	0.6	0.4
16	0.5	0.4	0.7	0.5
17	0.4	0.4	0.7	0.5
18	0.4	0.5	0.9	0.5
19	1.0	0.9	1.2	0.9
20	0.8	0.8	0.9	0.6
21	0.6	0.5	0.7	0.6
22	0.4	0.4	0.6	0.5
23	0.8	0.7	0.7	0.6
24	0.3	0.4	0.6	0.4
25	1.1	0.8	1.0	1.1
26	1.3	1.1	1.4	1.3
27	1.2	1.1	1.3	1.2
28	0.5	0.6	0.8	0.6
29	0.5	0.5	0.7	0.6
30	0.3	0.3	0.6	0.4
31	0.4	0.4	0.5	0.5
AVERAGE	0.6	0.6	0.8	0.6
MAXIMUM	3.0	2.9	2.5	2.4
MINIMUM	0.1	0.2	0.3	0.2
MEDIAN	0.5	0.5	0.7	0.6

* - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations MONTH: JANUARY 1992

Day	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PILOT PLANT (pCi/L)	BKGRD (pCi/L)
1	0.8	0.6	0.8	0.6
2	1.0	1.0	1.0	*
3	0.5	0.5	0.7	*
4	0.3	0.4	0.6	*
5	0.3	0.4	0.6	*
6	0.4	0.4	0.7	*
7	0.4	0.4	0.6	*
8	0.5	0.5	0.7	0.6
9	0.4	0.4	0.7	0.5
10	0.4	0.5	0.8	0.5
11	0.3	0.4	0.7	0.5
12	0.8	0.7	1.0	0.7
13	0.5	0.6	0.7	0.5
14	0.3	0.5	0.9	0.4
15	0.3	0.5	1.1	0.5
16	0.4	0.7	1.4	0.6
17	0.3	0.5	1.0	0.5
18	0.3	0.6	1.5	0.5
19	0.5	0.8	1.2	0.6
20	0.5	0.7	0.9	0.6
21	0.8	0.8	1.1	1.0
22	1.2	1.3	1.3	1.1
23	0.4	0.5	0.6	0.4
24	0.4	0.7	0.7	0.5
25	0.4	0.6	0.7	0.5
26	0.5	0.6	0.6	0.5
27	0.8	0.8	1.0	0.8
28	0.6	0.6	0.6	0.6
29	0.5	0.6	0.6	*
30	1.0	0.7	0.9	*
31	0.4	0.5	0.6	*
AVERAGE	0.5	0.6	0.8	0.6
MAXIMUM	3.4	2.5	3.3	2.3
MINIMUM	0.1	0.2	0.3	0.2
MEDIAN	0.4	0.6	0.7	0.5

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* - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations **MONTH:** OCTOBER 1991

Day	NW (pCi/L)	SW (pCi/L)	NE (pCi/L)	SE (pCi/L)
1	3.7	3.4	19.5	*
2	4.4	3.7	8.9	*
3	*	*	13.3	*
4	*	*	10.3	*
5	*	*	4.5	*
6	*	2.0	12.8	*
7	*	4.6	13.0	*
8	*	3.2	18.3	*
9	1.4	2.5	15.5	*
10	4.0	3.0	13.9	*
11	10.5	8.0	18.8	*
12	4.5	4.7	11.8	*
13	17.5	23.9	27.3	*
14	9.8	12.5	35.3	*
15	7.4	6.0	12.1	*
16	6.8	9.9	23.1	53.0
17	8.0	22.0	29.4	46.1
18	3.3	6.2	13.0	21.4
19	2.6	9.0	6.6	20.1
20	17.1	15.9	39.1	75.2
21	4.8	11.9	65.3	63.1
22	3.2	5.3	12.0	11.3
23	2.2	2.9	5.0	7.5
24	6.0	5.2	6.0	7.3
25	6.8	2.2	3.5	6.7
26	7.7	6.3	2.8	4.1
27	5.7	3.3	3.5	2.9
28	1.4	17.1	0.5	0.8
29	2.9	10.4	5.6	9.6
30	11.4	14.3	16.0	22.0
31	5.2	14.6	4.2	8.2
AVERAGE	6.3	8.4	15.2	22.4
MAXIMUM	17.5	23.9	65.3	75.2
MINIMUM	1.4	2.0	0.5	0.8
MEDIAN	7.1	6.0	12.1	9.6

* - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations MONTH: NOVEMBER 1991

Day	NW (pCi/L)	SW (pCi/L)	NE (pCi/L)	SE (pCi/L)
1	17.1	21.5	7.1	4.3
2	0.5	1.0	13.1	28.6
3	0.5	1.2	19.1	33.3
4	2.6	2.8	33.2	52.5
5	19.2	2.7	52.8	58.5
6	0.6	1.1	10.3	7.5
7	0.9	2.3	5.3	16.3
8	1.8	3.6	10.6	12.0
9	23.8	27.3	48.8	31.2
10	13.1	14.7	56.7	31.1
11	5.1	5.0	13.2	12.2
12	6.7	4.2	38.2	15.0
13	1.0	1.9	8.3	2.2
14	3.4	3.9	10.2	10.3
15	2.1	2.3	4.7	2.9
16	3.3	5.1	2.1	1.5
17	10.1	10.0	0.5	*
18	4.5	1.9	0.9	0.5
19	0.8	0.8	0.5	0.5
20	0.5	0.9	0.6	0.9
21	201.0	11.9	12.9	9.7
22	527.2	40.8	13.3	12.1
23	483.9	22.1	26.4	11.9
24	1.3	0.7	4.9	3.0
25	166.7	3.8	15.5	14.5
26	439.9	10.5	5.0	16.1
27	70.2	10.4	2.3	2.4
28	65.9	2.7	0.8	0.9
29	0.5	0.5	0.5	0.4
30	0.4	0.5	0.7	0.7
AVERAGE	69.2	7.3	13.9	13.6
MAXIMUM	3727.0	160.8	308.3	274.1
MINIMUM	0.2	0.3	0.2	0.2
MEDIAN	12.1	7.7	14.3	11.6

* - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations DATE: DECEMBER 1991

Day	NW (pCi/L)	SW (pCi/L)	NE (pCi/L)	SE (pCi/L)
1	0.9	1.7	0.5	0.6
2	1.9	3.4	0.6	0.6
3	0.5	0.7	2.5	1.5
4	0.5	0.6	2.4	1.5
5	0.4	0.6	1.0	0.5
6	1.3	1.3	1.4	1.2
7	0.5	0.7	0.8	0.4
8	0.4	0.4	0.5	0.3
9	0.8	1.0	0.9	1.5
10	1.5	2.1	1.6	2.4
11	2.0	2.2	2.0	2.3
12	2.0	2.1	1.4	1.4
13	0.9	0.9	0.8	0.6
14	0.4	0.6	1.0	1.1
15	0.4	0.6	0.9	1.1
16	0.8	0.7	1.3	1.1
17	0.5	0.6	0.9	0.8
18	0.6	0.8	0.7	1.5
19	1.3	2.1	1.2	2.0
20	1.2	1.6	1.0	1.1
21	1.1	1.0	1.7	1.8
22	0.8	0.7	0.9	0.5
23	1.3	1.8	1.0	1.2
24	0.5	0.7	0.9	1.4
25	1.9	3.0	2.0	3.5
26	2.2	3.5	2.7	6.7
27	1.5	2.0	1.9	2.3
28	0.9	1.1	0.5	0.5
29	0.8	1.1	0.9	1.5
30	0.4	0.6	0.3	0.4
31	0.6	0.7	0.3	0.3
AVERAGE	1.0	1.3	1.2	1.4
MAXIMUM	9.4	8.9	5.8	24.8
MINIMUM	0.2	0.3	0.2	0.1
MEDIAN	0.8	1.0	1.0	1.2

• - Data not available

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

Period Ending January 31, 1992

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

Selected Radon Data Report

LOCATION: Selected Sampling Locations DATE: JANUARY 1992

Day	NW (pCi/L)	SW (pCi/L)	NE (pCi/L)	SE (pCi/L)
1	1.0	1.7	0.6	0.8
2	1.7	1.8	0.8	1.1
3	0.7	1.0	0.5	0.6
4	0.4	0.6	0.5	0.5
5	0.7	0.8	0.3	0.3
6	0.6	1.1	0.7	1.1
7	0.7	0.8	0.6	0.6
8	1.3	1.0	0.4	0.5
9	0.5	0.6	0.7	0.9
10	0.5	0.7	0.7	1.2
11	0.6	0.6	0.7	0.4
12	1.1	1.7	1.1	1.2
13	1.3	1.4	0.8	0.7
14	0.5	0.8	0.5	1.5
15	0.4	0.5	0.9	0.7
16	0.6	0.6	0.9	0.3
17	0.5	0.5	1.1	0.8
18	0.6	0.7	0.9	0.9
19	1.9	1.0	1.8	2.7
20	0.9	1.0	1.5	1.3
21	1.4	2.0	1.7	1.7
22	1.9	2.5	1.9	2.5
23	0.9	0.8	1.0	0.9
24	0.8	1.1	1.3	1.4
25	0.9	0.9	0.8	0.9
26		1.8	0.6	0.9
27		1.8	1.5	2.0
28	0.8	1.3	0.9	1.3
29	2.0	1.8	1.1	1.9
30	0.8	2.4	2.9	3.7
31	0.4	0.8	0.7	1.0
AVERAGE	0.9	1.2	1.0	1.2
MAXIMUM	5.0	9.6	7.6	15.6
MINIMUM	0.2	0.1	0.2	0.1
MEDIAN	0.8	1.0	0.8	0.4

* - Data not available

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT

FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

PERIOD ENDING JANUARY 31, 1992

ENCLOSURE D

DRILLING/BORING LOGS

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE 1-8-92
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 1 OF ~~8~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1-8-92 800 100841	2	6	FIRM (10YR 3/2) VERY DARK grayish BROWN (Silty clay, moist, Low plasticity, with Root Lets.	CI	1.75	Trip field Blank 100842
	1-8-92 800 100843	4	6	HARD (10YR 2/2) VERY DARK BROWN, silty clay with Root Lets, Low Plasticity, moist.	CI	2.5	HNU = Ø PPM βγ = Ø above Background
1		6	0	No RECOVERY	NA	NA	
		7	0	No Recovery	NA	NA	
2	1-8-92 810 100845	4	6	HARD (10YR 3/2) VERY DARK grayish BROWN, silty clay Slightly Moist Low Plasticity.	CI	2.75	HNU = Ø PPM βγ = Ø above Background
		7	6	A/A.	CI	2.75	

NOTES: R.S.= Rad Screen A/A= As Above.

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	NO METER IN OFFICE	

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 2 OF ~~9~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		6	0	NO RECOVERY	NA	NA	
		6	0	NO RECOVERY	NA	NA	
4	820 100844 RS. 100847	10	6	HARD (10YR 4/4) dark yellowish Brown, Silty clay, Low Plasticity, moist.	CI	2.5	HNU = Ø ppm βγ = Ø cpm above Back ground.
	100845 RS 100848	9	6	A/A	CI	2.75	
5			~~18~~ 1-14-92				
	100846 R.S 100849	9	6	A/A.	CI	2.25	
		6	0	NO RECOVERY	NA	NA	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Logger: John Strapzzon
Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	NO METER IN OFFICE.	

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 3 OF ~~8~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS 1-14-92
6	1-8-92 830 100850	13	6	FIRM (10YR 4/3) DARK BROWN, Silty clay (with some Very fine Sand) Low plasticity, Slightly moist.	CI	1.5	HNU = Ø ppm βγ = Ø cpm above Background.
		9	6	A/A	CI	1.25	
7		9	6	A/A	CI	2.0	
		6	0	NO RECOVERY	NA	NA	
8	1-8-92 900 100851	Shelby Tube	12	VERY HARD (10YR 5/4) yellowish Brn. Silty clay with gravel, Slightly moist, No plasticity.	CI	4.5	HNU = Ø ppm βγ = Ø cpm above Background. Sample was archived due to low recovery.
9				AUGER to 10' to By Pass Rock.			
10							

NOTES:

R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon
Kevin Myers

Sample Tech. Vern Larger

Instrument	Seriel #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	NO METER	in office

Samples collected per ASTM Colors identified using Munsell Color Chart

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 4 OF ~~8~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 inches	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS BEA 1-14-92
10	1-8-92 945 100852	Shelby tube	12	VERY HARD (10YR 4/4) Dark yellowish Brown, Silty Clay with Traces of gravel, Low Plasticity, Slightly Moist.	Cl	4.5	HNU = Ø PPM BY = Ø CPM above Background Due to low recovery - Archive sample
12	1-8-92 955 100853	23	6	A/A	Cl	4.5	HNU = ØPPM BY = Ø cpm above Background
		19	6	VERY HARD (10YR (4/4) Dark yellowish Brown mottled with gray, Silty Clay with some Sand (fine) and traces of gravel, Low, Plasticity, Slightly Moist.	Cl	4.5	END of weathering ZONE
13	1-8-92 955 100854	34	6	VERY HARD (5Y 4/1) Dark gray, Silty Clay with Traces of Sand & gravel Low plasticity, Slightly moist.	Cl	4.5	
		29	6	A/A	Cl	4.5	
14	1-8-92 1100 ~~100855~~ 100859	5	6	HARD (5Y 4/1) Dark gray, Silty Clay with Traces of Sand & gravel, Low plasticity, slightly moist	Cl	3.5	Total V sample Change Sample No. to 100859 + RS.

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon
Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	Ø
BY Meter	85665	40-60
α Meter	NO METERS	IN OFFICE

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 5 OF ~~8~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS HEM 1-14-92
15	1-8-92 1100 100859	9 Total γ/gamma spec.	5	A/A	CI	2.25	HNU = Ø ppm Bγ = Ø cpm above Back ground
		12	~~HEM 11~~ 1-14-92 0	No Recovery	NA	NA	
		14	0	No RECOVERY	NA	NA	
16	1-8-92 1115 100854	23	6	VERY HARD (5Y 4/1) Dark gray, Silty clay with Traces of Sand & gravel, Low plasticity, Slightly Moist.	CI	4.5	HNU = Ø ppm Bγ = Ø cpm above Back ground
		47	6 ~~HEM 24~~ 1-14-92	A/A	CI	4.5	
17		34	6	A/A	CI	4.5	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon
Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	Ø
Bγ Meter	85665	40-60
α Meter	NO METER IN OFFICE	

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE: JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST: G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 6 OF ~~9~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BY 1-14-92)
	1-8-92 1115 100854	29	6	A/A.	CI	4.5	
18	1-8-92 1130 100855 RS 100857	39	6	HARD (5Y 4/1) Dark gray, Silty Clay with Traces of Sand & gravel, Low plasticity, Slightly moist.	CI	3.5	HNU = Ø ppm BY = Ø cpm above Background
	1-8-92 1130 100856 RS 100858	45	6 (12) 1-14-92	VERY HARD (5Y 4/1) Dark gray, Silty Clay with Sand & gravel, no Plasticity, Slightly moist.	CI	4.5	
19		50	0	NO RECOVERY	NA	NA	HAD Refusal on the split spoon Cobble stuck at the End of the split spoon.
		Split spoon Refusal NA	0	Refusal of split spoon - NO RECOVERY	NA	NA	Total U sample # 100859 at 14-16ft
20	1-9-92 1500 100860	17	6	VERY Soft (5Y 4/1) Dary gray, Clayey Sand with Traces Of gravel VERY moist. NO Plasticity.	SC	1-14-92 BGN 1.5 25	HNU = Ø ppm BY = Ø cpm above Background Strap hole found, 6" Water in hole.

NOTES:

R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech.: Vern Larger

Instrument	Seriel #	Background
HNU Meter	711111	Ø
BY Meter	85665	40-60
∝ Meter	NO METER IN OFFICE	

Samples collected per ASTM Colors identified using Munsell Color Chart

407-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS AUGER		PAGE 7 OF ~~8~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 Inches	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (ppm 1-14-92)
	1-8-92 1500 10086	11	6 ~~12~~ ppm 1-14-92	FIRM (5Y 4/1) DARK GRAY, SILTY CLAY WITH SOME SAND & GRAVEL VERY MOIST, MEDIUM PLASTICITY	Cl	~~.25~~ 1.5	
21							
		10	0	NO RECOVERY	NA	NA	
		6	0	NO RECOVERY	NA	NA	
22	1-8-92 1525 10086	13	6	HARD (A/A)	Cl	2.5	HNU = Ø ppm Bγ = Ø cpm above Background
		15	ppm ~~24~~ 1-14-92 6	FIRM (A/A)	Cl	1.75	
23		19	6	A/A	Cl	.75	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	- Ø
Bγ Meter	85665	40-60
α Meter	NO METER	IN OFFICE

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1734	COORDINATES:	DATE: JAN 08 1992
ELEVATION: Est. 590'0	GWL: Depth Date/Time	DATE STARTED: JAN 08 1992
ENGINEER/GEOLOGIST: G.E.Marshall	Depth Date/Time	DATE COMPLETED: JAN 08 1992
DRILLING METHODS: AUGER		PAGE 8 OF ~~8~~ 10

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (MFR 1-14-92)
		16	6	A/A	CL	1.0	
24	1-8-92 1532 100861	5	6	VERY Soft (5Y 4/1) ~~Silty~~ Dark gray Silty Clay with some sand & gravel, wet to VERY moist, medium plasticity.	CL	.25	HNU = Ø PPM BY = Ø cpm above Back ground.
		6	MFR 1-14-92 6	A/A.	CL	.25	water & sludge was SEND to Lab. Sample # 100862
25		5	W 01/22/92 N 0	NO RECOVERY	NA	NA	auger Rod had a water mark 8' up, water was Running out of spoon
		7	0	NO RECOVERY	NA	NA	Stop boring because of perched water. Sending water and Soil to Lab sample # 100862 + Rad Screen.
26				Bottom of Boring 26.0 FT			
				Composite Drum Sample Total U Total Th. R&I Lab sample # 100863 WEMCO Lab sample # 100864			Boring was halted due to hitting perched groundwater. at ≈ 20.0 FT

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM

Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
BY Meter	85665	40-60
α Meter	no meter in office	

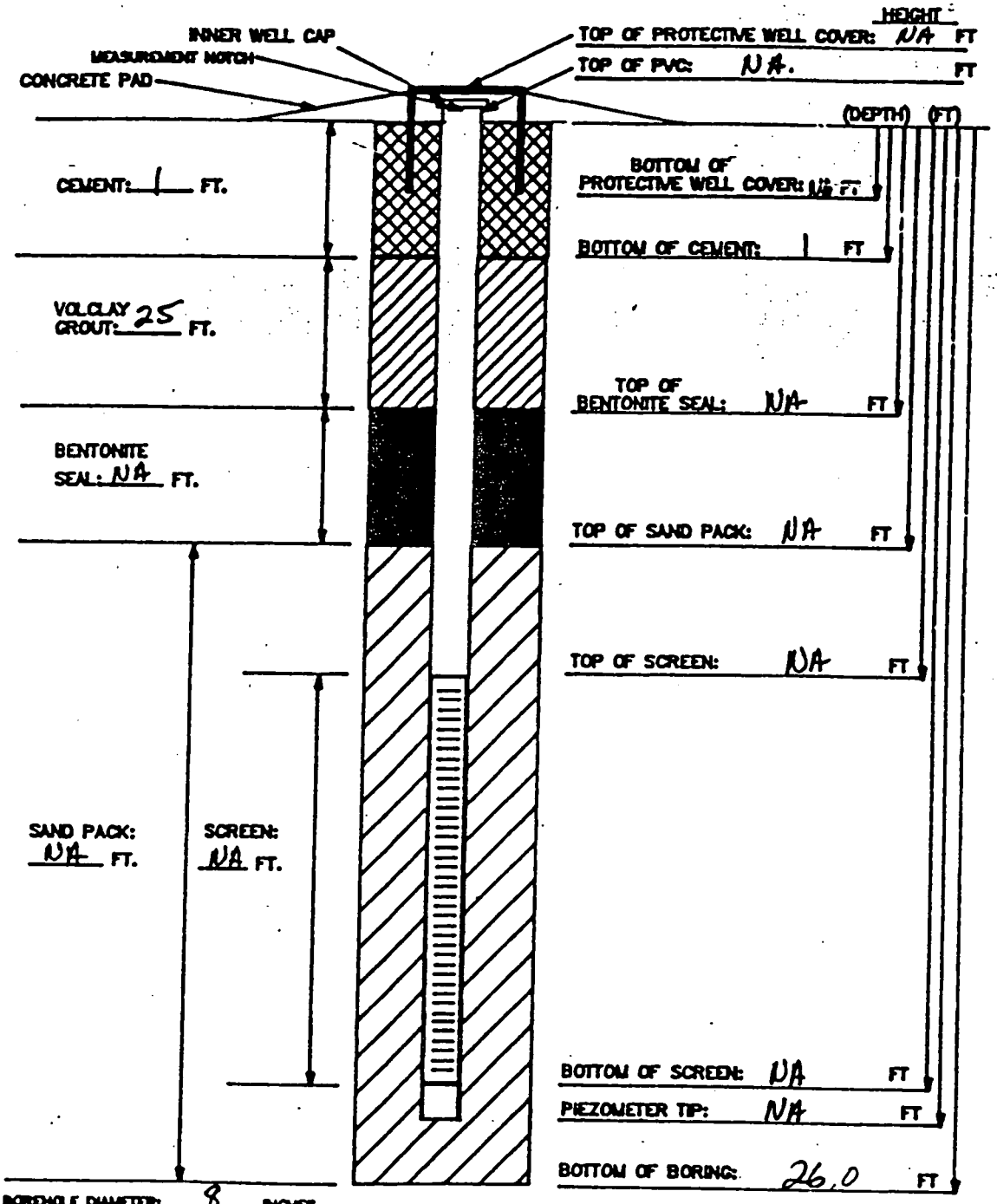
402-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1734

INSTALLATION DATE: 1-8-92

2900



MATERIALS USED:

SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1.5 sks
AMOUNT OF CEMENT: 1.5 sks
AMOUNT OF WATER USED: 40 gals
OTHER: NA.

NOTES:

1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22

GEOLOGIST/ENGINEER: Glen E Marshall

FERNALD RI/FS

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS (EWMF) FIELD ENG./GEO. JE Marshall DATE 1-14-92
PROJECT NO. 9602.3.22 CHECKED BY C Grube DATE 01/23/92
BORING NO. 1734
PIEZOMETER NO. NA DATE OF INSTALLATION NA

BOREHOLE DRILLING

DRILLING METHOD Auger	TYPE OF BIT Auger Bit.
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM — TO —	SIZE NA FROM — TO —
FLUID NA FROM — TO —	SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft.)	
TOP OF RISER PIPE	NA		NA	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA		NA	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1	BOTTOM 26	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
SAND	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
GRAVEL	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PIEZOMETER TIP	NA		NA	
BOTTOM OF BOREHOLE	26			
GWL AFTER INSTALLATION	NA		NA	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? NA YES ☐ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? NA YES ☐ NO ☐
REMARKS 1.0' of Cement from 0.0 to 1.0'

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1732	COORDINATES:	DATE 1/8/92	
ELEVATION: 592 ft	GWL: Depth Date/Time	DATE STARTED: 1/8/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/9/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 9	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		2	6	Stiff. 10YR (4/2) Dark grayish brown. Clay High plasticity. Moist	CI	1.0	Hard Auger 1st 6" Sample 101385 Trip blank 101386 (1500) 1/7/92 HNU=0 ppm BG=0 cpm
	101387 (1515) 1/8/92	4	6	Stiff. 10YR (4/2) Dark grayish brown. Clay. High plasticity. Moist.	CI	.75	
1		6	4	SAA	CI	1.0	
		7	0	No Recovery	NA	NA	
2	101388 (1526) 1/8/92	2	6	Very stiff. 10YR (5/4) Yellowish brown. Silty clay. Low plasticity, moist	CI	3.25	HNU=0 ppm BG=0 cpm
		4	6	SAA, Stiff	CI	2.75	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Clay Gardner
Dan Jamison

Background
HNU=0 ppm
BG=0 cpm
Background subtracted out.

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9402-3.22	PROJECT NAME: Fernald RI/FS EU MF		
BORING NUMBER: 1732	COORDINATES:	DATE 1/8/92	
ELEVATION: 592 ft	GWL: Depth Date/Time	DATE STARTED: 1/8/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/9/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 2 OF 9	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		6	0	No Recovery.	NA	NA	
		9	0	No Recovery.	NA	NA	
4 RAD	101389 101390 (1530) 1/8/92	11	6	Hard. 2.5y(6/3) Light yellowish brown, gravelly clay. No plasticity, dry	CI	>4.5	HNU= 0 ppm RS= 0 cpm
RAD	101391 101392 (1530) 1/8/92	19	6	SAA	CI	>4.5	
5 RAD	101393 101394 (1530) 1/8/92	18	6	SAA	CI	>4.5	
		21	0	No Recovery.	NA	NA	

NOTES:
Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Clay Gardner
Dan Jamison

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1782	COORDINATES:		DATE 1/8/92
ELEVATION: 592 ft	GWL: Depth	Date/Time	DATE STARTED: 1/8/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 1/9/92
DRILLING METHODS: Hollow Stem Auger			PAGE 3 OF 89

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101394 (1830) 1/8/92	60	6	Hard. 2.5Y (6/3) Light yellowish brown. Gravelly clay, no plasticity, dry.	Cl	>4.5	HNU=0 ppm BG=0 cpm
		45	0	No Recovery	NA	NA	
7		40	0	No Recovery	NA	NA	
		32	0	No Recovery	NA	NA	
8	101394 (1615) 1/8/92	10	6	Hard. 2.5Y (7/4) Pale yellow gravelly clay, no plasticity dry.	Cl	>4.5	HNU=0 ppm BG=0 cpm
		11	6	SAA	Cl	>4.5	

NOTES:
Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Elay Gardner
Dan Jamison

402-11-46

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF	
BORING NUMBER: 1732	COORDINATES:	DATE 1/8/92
ELEVATION: 592.27	GWL: Depth Date/Time	DATE STARTED: 1/8/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/9/92
DRILLING METHODS: Hollow Stem Auger		PAGE 4 OF 89

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		13	4	Hand. 2.5Y (7/4) Pale yellow gravelly clay, no plasticity dry.	CL	>4.5	
		15	0	No Recovery	NA	NA	
10		13	0	No Recovery	NA	NA	
		17	0	No Recovery	NA	NA	
11		24	0	No Recovery	NA	NA	
		21	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Dan Jamison

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1782	COORDINATES:		DATE 1/9/92
ELEVATION: 592 ft	GWL: Depth	Date/Time	DATE STARTED: 1/8/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 1/9/92
DRILLING METHODS: Hollow Stem Auger			PAGE 5 OF 9

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101396 1083 1/8/92	11	6	Very stiff. 2.5 (7/4) Pale yellow, gravelly clay. No plasticity, dry.	Cl	3.75	HNU = 0 ppm BG = 0 cpm
		31	6	Top 4" SAA. Bottom 2" Sand + gravel, wet	Cl	3.75	
13		80	0	No Recovery.	NA	NA	
		36	0	No Recovery	NA	NA	
14 ~~980~~ ~~1/8/92~~ 1/2/92	101397 ~~101398~~ 1083 1/8/92	17	6	Hard. 2.5Y (6/3) Light yellowish brown clay, No plasticity, Dry.	Cl	>4.5	HNU = 0 ppm BG = 0 cpm
		25	6	SAA	Cl	>4.5	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Elay Gardner
Don Jamison

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		DATE 1/9/92
BORING NUMBER: 1732	COORDINATES:		DATE STARTED: 1/8/92
ELEVATION: 592 ft	GWL: Depth	Date/Time	DATE COMPLETED: 1/9/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	PAGE 6 OF 9
DRILLING METHODS: Hollow Stem Auger			

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		50	4	Hard. 2.5 (6/3) Light yellowish brown, clay, no plasticity dry	Cl	>4.5	
		6	0	No Recovery	NA	NA	
16	10 LSB 10905 1/9/92	31	6	Hard. 2.5Y (6/3) Light yellow brown. Clay with fossils. Dense, dry. Consistency of shale	Cl	>4.5	HNu=0ppm RX=0cpm
		48	6	SAA	Cl	>4.5	
17		60	6	SAA	Cl	>4.5	
			0	No Recovery	NA	NA	Refusal.

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Clay Gardner
Don Jamison

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EU MF		
BORING NUMBER: 1732	COORDINATES:	DATE 1/9/92	
ELEVATION: 592 ft	GWL: Depth Date/Time	DATE STARTED: 1/8/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/9/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 7 OF 9	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101399 101400 (0945) 1/9/92	7	6	Soft, 2.5(7/3) Pale Yellow sandy clay, very wet.	Cl	<.25 <.25 DSO 1/21/92	HNU=0ppm RS=0cpm
	101401 101402 (0945) 1/9/92	27	6	SAA	Cl	<.25 <.25 DSO 1/21/92	
19	101403 101404 (0945) 1/9/92	37	6	SAA	Cl	<.25 0	
	101405 101406 (0945) 1/9/92	50	6	SAA	Cl	<.25	
20	101407 (0955) 1/9/92	24	6	~~Soft~~ SAA DSO 1/9/92	Cl	<.25	HNU=0ppm RS=0cpm
		60	6	SAA	Cl	<.25	Hit perched water at 21 ft. Stopped drilling

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Clay Gardner
Dan Jamison

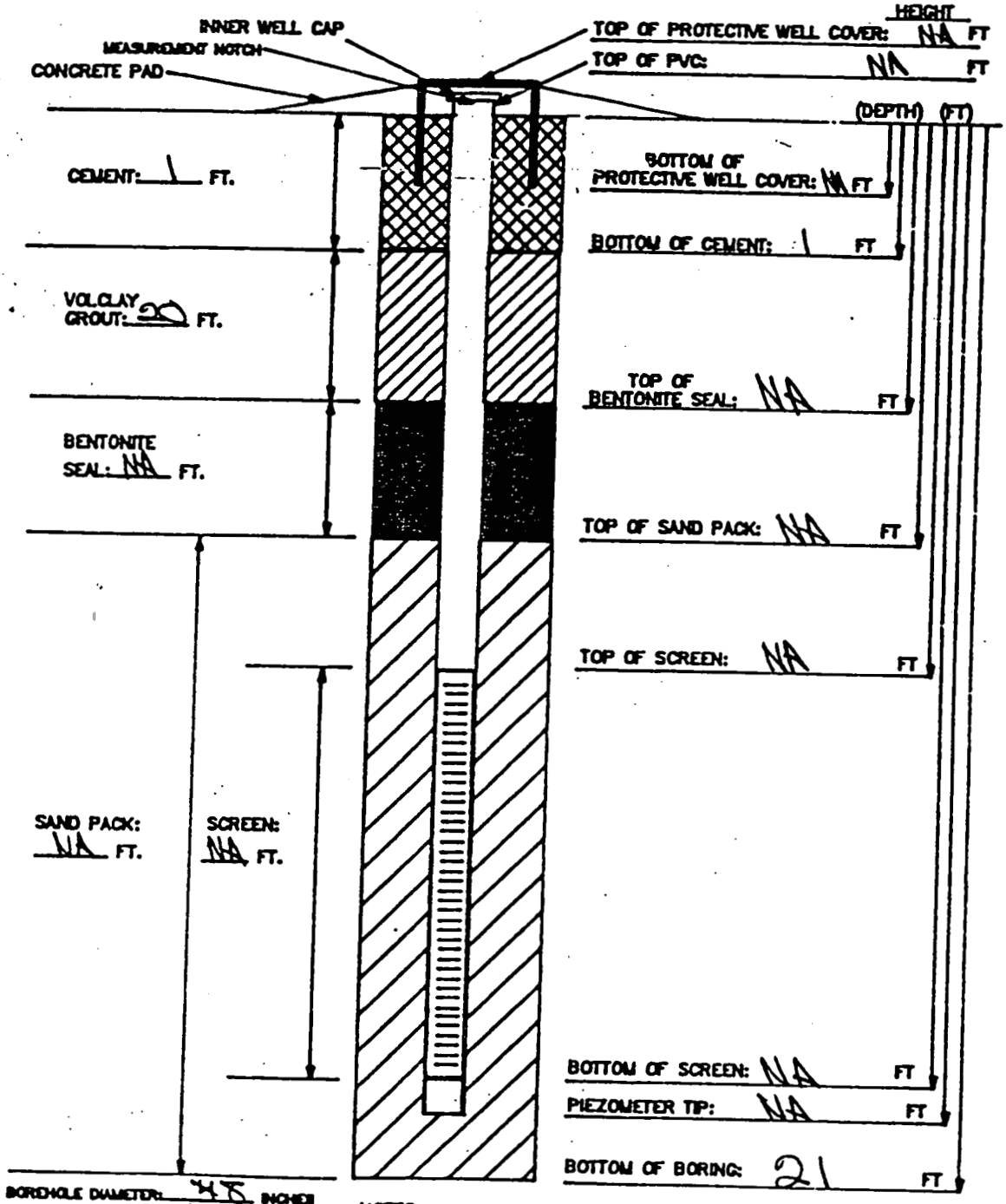
402-11-86

8019
2900

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1732

INSTALLATION DATE: 1/9/92



BOREHOLE DIAMETER: 4 5/8 INCHES
DSO 1/21/92

MATERIALS USED:
SAND TYPE AND QUANTITY:
BENTONITE PELLETS (5-GALLON BUCKETS):
BAGS OF VOLCLAY GROUT: 1 bag grout
AMOUNT OF CEMENT: 1/2 bag cement
AMOUNT OF WATER USED:
OTHER: N.A

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22 GEOLOGIST/ENGINEER: D. O'Brien

FERNALD
RI/FS

9019
2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FLUME FIELD ENG./GEO. D. O'Brien DATE 1/9/92
PROJECT NO. 9602-3.22 CHECKED BY C. Grube DATE 01/16/92
BORING NO. 1732
PIEZOMETER NO. NA DATE OF INSTALLATION 1/9/92

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Auger
DRILLING FLUID (S) USED:
FLUID NA FROM NA TO NA
FLUID NA FROM NA TO NA

TYPE OF BIT NA
CASING SIZE (S) USED:
SIZE NA FROM NA TO NA
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE:
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1.0	BOTTOM 21.0	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	21.0			
GWL AFTER INSTALLATION	NA			

S THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
S A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
ARKS 0.0-1.0 ft. cement cap

409-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.22	PROJECT NAME: Temp RI/FS EWMF		
BORING NUMBER: 2731	COORDINATES:	DATE 1-8-92	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-8-92	
ENGINEER/GEOLOGIST: J. Leat	Rapid Date/Time	DATE COMPLETED 1-8-92	
DRILLING METHODS: Cable Tool		PAGE 1 OF 8	

S.A.A - Same As Above

N.R. No Recovery

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BEA 1-15-92)
	100549 100550	4		V. stiff dark brown (10yr 3/3) silty clay trace organics, low plasticity, moist.			Hnu - 0 ppm
1	105	8	10		CL	3.25	Bb - 50 cpm
	1-8-92	10					α - 0 cpm
	100550	5					Hnu - 0 ppm
2	1020	10	12	S.A.A.	CL	3.25	Bb - 50 cpm
3	1-8-9	12					α - 0 cpm
	100550	10		V. stiff, dark yellowish brown, (10yr. 3/6) silty clay, trace gravel, moist.			Hnu - 0 ppm
4	1025	17	16		CL	3.0	Bb - 50 cpm
	1-8-92	22					α - 0 cpm
	100551	3					Hnu - 0 ppm
5	1030	6	13	S.A.A.	CL	3.0	Bb - 50 cpm
6	1-8-92	10					α - 0 cpm
	100552 1035 1-8-92	3	6	m. dense gray (10yr. 5/1) poorly graded angular gravel, wet. 6.25'	GP	NA	Hnu - 0 ppm
	100554 1035 1-8-92	6	6	very stiff, yellowish brown, (10yr. 5/6) silty clay, low plast. moist 6.5'	CL	2.5	Bb - 50 cpm
7	100556 1035 1-8-92	9	4	very stiff, dark yellowish brown, (10yr. 3/6) silty clay, low plastic, moist. 7.0'	CL	2.5	α - 0 cpm
				stiff, yellowish brown, (10yr. 5/8) silty clay, mud to high plast. V. moist.	CL	1.0	

NOTES

Drilling Contractor - Penn Drilling
Drilling Equipment - Cyclone 43
Driller - Craig Coulter
Asst. - Gary Dye

100549 - Rad Screen - Geotech (Dirt)
100553 - " " Geochem 6.0-6.5 ft
100555 - " " Geochem 6.5-7.0 ft
100557 - " " Geochem 7.0-7.5 ft

Backgrounds
Hnu - 0 ppm
Bb - 50 cpm
α - 0 cpm

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.22	PROJECT NAME: FCMP RI/FS		
BORING NUMBER: 2731	COORDINATES:	DATE 1-8-92	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-8-92	
ENGINEER/GEOLOGIST: J. Leary	Depth Date/Time	DATE COMPLETED: 1-19-92	
DRILLING METHODS: Cable Tool		PAGE 2 OF 8	

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8	100558 1035 1-8-92	13	0	N.R.	NA	NA	Hnu 0 BD 0 See page 1
9	100559 100560 100561 1130	No blow counts on Shelby Tube	30	Stiff, yellowish brown, (10yr, 5/6) silty clay, some gravel, Low plasticity, moist. ↓	CL	1.5	Hnu - 0 ppm BD - 50 cpm α - 0 cpm
11	1-8-92	NA	0	N.R.	NA	NA	
12	100562 1340 1-8-92	3 7 9	16	med dense, yellowish brown (10yr, 5/6) clayey silt, some sand, moist to wet. 12.0' laminar poorly graded sand wedge yellowish brown, (10yr 5/6) ~12.25 med dense, yellowish brown, (10yr, 5/6). clayey silt, trace gravel, moist to wet.	ML SP ML	NA NA NA	Hnu - 0 ppm BD - 50 cpm α - 0 cpm
13	100563 1405 1-8-92	17 100/5	18	Dense, brown to yellowish brown, (10yr, 5/3) to (10yr 5/6) clayey silt, some gravel, sl moist to moist. Sandstone cobble sampled thru at 13.25' 13.5' JL 1-9-92 V. stiff, gray (10yr, 5/1) silty clay, Low plast. moist.	ML CL	NA 1.75	Hnu - 0 ppm BD - 50 cpm α - 0 cpm
14	100564 1435 1-8-92	17 18	7	Dense, gray (10yr, 5/1) silt, some clay, Saturated	ML	NA	Hnu - 0 ppm BD - 50 cpm

NOTES
#100560 - Rad Screen Shelby 8.0'
100561 - " " Shelby 10.5'

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP-RI/FS-CWMF	
BORING NUMBER: 2731	COORDINATES:	DATE 1-8-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-8-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 1-13-92
DRILLING METHODS: Cable tools		PAGE 3 OF 9

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15	Sat Above 1-8-92	21	7 Above J.L 1-28-92	S.A.A.			α - 0 cpm
16	100565 1530 1-8-92	3	6	Stiff, gray (10yr, 5/1) gray silty clay, trace gravel, moist.	CL	2.0	Hnu - 0 ppm
	100567 1530 J.L 1-8-92	7	6 12 J.L 1-8-92	S.A.A	CL	2.0	Bb - 50 cpm
17	100569 1530 1-8-92	13	0	N.R.	NA	NA	
	100570 1530 1-8-92	18	0	N.R.	NA	NA	α - 0 cpm
18	100571 100572 1-9-92 1600	35	9	Stiff, gray, (10yr 5/1) ~~gray~~ J.L 1-8-92 clay, some silt, med plasticity, V. moist.	CL	J.L 1-9-92 2.0	Hnu - 0 ppm
		7					Bb - 50 cpm
	1-8-92	13	J.L 1-9-92				J.L 1-9-92 α - 0 cpm
19	100572 1-9-92	3	8	Soft, gray to grayish brown (10yr, 5/1) to (10yr 5/2) clayey silt to silty clay, med to high plasticity. V. moist.	ml/cl	.5	Hnu - 0 ppm
	1615	7					Bb - 50 cpm
20	1-8-92	9					α - 0 cpm
21	100573 J.L 1-9-92	17	5	Stiff dark greyish brown, (2.5y, 4/2) silty clay, some gravel, low plasticity, moist.	CL	1.5	Hnu - 0 ppm
	1625	19					Bb - 50 cpm
22	1-8-92	50/5					α - 0 cpm

NOTES

#100566 - Rad Screen Geochem 15.5-16.0

#100568 " " " 16.0-16.5

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.5.22	PROJECT NAME: [illegible]	
BORING NUMBER: 2731	COORDINATES:	DATE 1-8-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-8-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Cable Tool		PAGE 4 OF 8

DEPTH (Ft.)	SAMPLE (TYPE & NO.)	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
22	100574 1645 1-8-92	100/5 21 22	6 JL 1-8-92	S.A.A	CL	1.5	HNU - 0 ppm BG - 50cpm α - 0cpm
23							
24	100576 JL 1-10-92 0900 1-9-92	No blow counts on Shelby tubes	0	Shelby tube pushed 1.0' No recovery	NA	NA	HNU - ↑ BG - NA α - ↓
25	100577 JL 1-10-92 0940 1-9-92	35 65 50/3	4	V. stiff, gray to dark grayish brown. (10yr, 5/1) to (2.5y, 4/2) silty clay, some gravel, moist. Low plasticity	CL	2.5	HNU - 0 ppm BG - 50cpm α - 0cpm
26							
27	100578 JL 1-10-92 0950 1-9-92	50 50/0	4	Hard, olive to gray (5y, 4/3) to (10yr, 5/1) silty clay, some gravel, low plast. moist. L 26.5 ~~N.R.~~ J.L 1-28-92	CL	4.0	HNU - 0 ppm BG - 50cpm α - 0cpm
28	100579 100580 JL 1-10-92 1000 1-9-92	23 35 50/3	3	Hard, olive to gray (5y, 4/3) to (10yr, 5/1) silty clay, some gravel, low plasticity. moist	CL	4.25	HNU - 0 ppm BG - 50cpm α - 0cpm
29							

NOTES
#100575 - Red Screen, Disturbed - Geotech, 22.0-29.0

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.322	PROJECT NAME: FEMP RI/FS EUMF	
BORING NUMBER: 2731	COORDINATES:	DATE 1-9-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-8-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED 1-13-92
DRILLING METHODS: Cable Tool		PAGE 5 OF 8

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
29	100574 1000 1-9-92	100/0	0 ~~NA~~	NA	NA	NA	NA
30				Bedrock believed to be hit-spoon refusal, drill to 30.5			
31				spoon refusal, drill to 31.5			
32	100576 1340 1-9-92	100/5	6	weathered calcareous shale			Hnu - 0 ppm BG - 50 cpm - 0 cpm

NOTES
*100579 - Total U - Total Thorium Drum cutting
*100578 - Full HSL Full Rad Hand Auger
*100578 - Trip Field Blank

FERNALD RI/FS

~~Page 6 of 8~~ pem 1-29-92

VISUAL CLASSIFICATION OF ROCK

PROJECT NUMBER 602.3.22 FIELD ENG./GEO. G. Marshall PAGE 6 OF 8

PROJECT NAME FERNALD RI/FS EWMF BORING NO. 2731

APPROX. ELEV. _____ CORE SIZE 2 DATE 1-13-91

DRILLING METHOD Cable Tool / AUGER DATE STARTED 1-8-92

COORDINATES _____ DATE COMPLETED 1-13-91

CASING INFORMATION		GROUNDWATER LEVEL DATA			
SIZE	DEPTH	ACTUAL TIME	DEPTH	ACTUAL TIME	DEPTH
10"	32'	NA	—	—	—

RUN NUMBER	DEPTH (ft)	RECOVERY (in)	% RECOVERY	% RQD	DESCRIPTION	JOINT SPACING MAXIMUM	MINIMUM	AVERAGE	REMARKS
	32								
		6			VERY HARD (7.5 YR N 5/) gray. Limestone fossiliferous, Broken to slightly Broken, coarsely crystalline, very Thinly Bedded with Dark gray shale.				~~No Sem~~ HNU = Ø ppm Bg - Ø cpm above Back ground
		6							
	33								
		6			A/A				
		6							
	34								
1		6			A/A				
		6							
	35								
		6			A/A				
		6							
	36				HARD (7.5 YR N5/) gray, Limestone, massive, finly crystalline, Thinly Laminated with Dark gray shale.				
		6							
		4							
	37				NO RECOVERY				HNU Background = Ø ppm Bg " = ~~Ø cpm~~ 40-60 cpm
	37.5				Stop coring at 37.5' 14:15				

NA

09 oct 2/92

133

398-11-86

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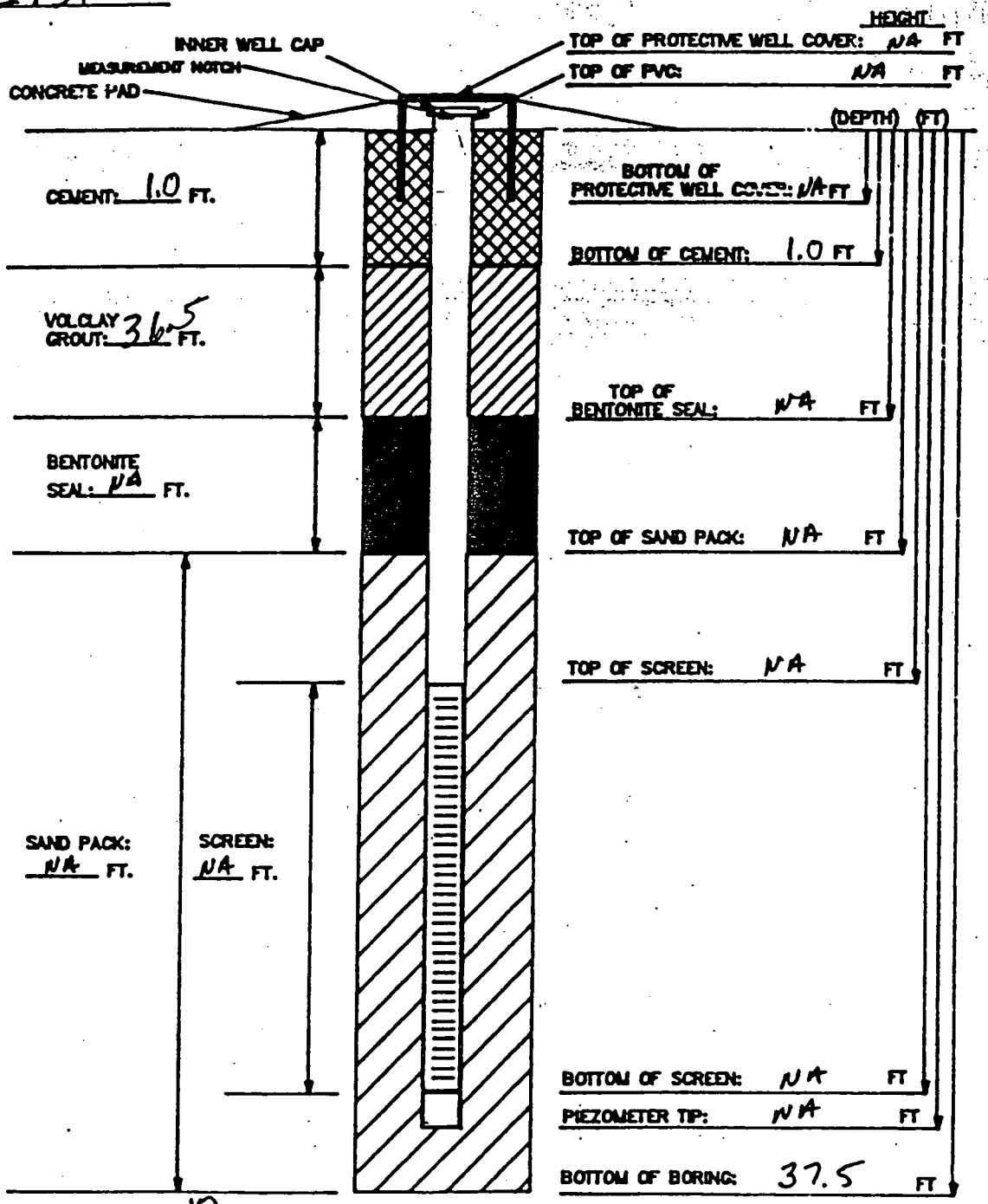
PGM
1-15-92

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
2731

INSTALLATION DATE: 1-8-92
2900



BOREHOLE DIAMETER: 10 INCHES

MATERIALS USED:
SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 2
AMOUNT OF CEMENT: 1/2 bag
AMOUNT OF WATER USED: 50 gals.
OTHER: NA

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE:
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22

GEOLOGIST/ENGINEER: GE Marshall

Page Slot 1 of 1 for boring

FERNALD RI/FS

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS (EWMF) FIELD ENG./GEO. DE Marshall DATE 1-15-92
PROJECT NO. 9602.3.22 CHECKED BY C Grule DATE 01/27/92
BORING NO. 2731
PIEZOMETER NO. NA DATE OF INSTALLATION NA

BOREHOLE DRILLING

DRILLING METHOD ~~Auger~~ Cable tool (DEM 1-15-92)	TYPE OF BIT ~~Auger Bit~~. Cable Tool / Core Bit. (DEM 1-15-92)
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM — TO —	SIZE NA FROM — TO —
FLUID NA FROM — TO —	SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	NA		NA	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA		NA	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1	BOTTOM 37.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
SAND	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
GRAVEL	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PIEZOMETER TIP	NA		NA	
BOTTOM OF BOREHOLE	37.5			
GWL AFTER INSTALLATION	NA		NA	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? NA YES ☐ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? NA YES ☐ NO ☐
REMARKS 1.0' of cement from 0.0 to 1.0'

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: Est 586.5	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST: G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 1 OF ~~10~~ 12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (DPM 1-14-92)
	0830 1-9-92 100865	2	6	VERY Soft (10 2/2) VERY DARK BROWN Silty clay with RootLets, No plasticity moist.	Cl	.25	Trip Field Blank Sample # 100866 HNU = Ø ppm. Bγ = Ø cpm above Background
		2	0 (Ø 1-14-92)		NA	NA	
1				NO RECOVERY			
		4	0	NO RECOVERY	NA	NA	
		6	0	NO RECOVERY	NA	NA	
2	1-9-92 0840 100867	5	6	HARD (10YR 4/4) DARK yellowish Brown Silty Clay, with TRACES of SAND (VERY fine) MEDIUM plasticity, Moist.	Cl	2.25	HNU = Ø ppm Bγ = Ø cpm above Background
		7	6 (~~10~~ 1-14-92)	A/A.	Cl	2.25	
3							

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
Bγ Meter	85665	40-60
α Meter	No METER at office.	

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: 586.5' (est)	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 2 OF ~~10~~ 12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (PEM 1-14-92)
3		7	0	NO RECOVERY	NA	NA	
		8	0	NO RECOVERY	NA	NA	
4	1-9-92 0950 100868 R.S. 100870	15	6	HARD (10YR 5/6) Sandy silty clay (sand fine), yellowish Brown, No plasticity, DRY.	CI	4.5	HNU = Ø PPM Br = Ø cpm above Background
	100869 R.S. 100871	17	2 (~~PEM~~ 0 1-14-92)	A/A.	CI	3.75	
5		18	0	NO RECOVERY	NA	NA	
		12	0	NO RECOVERY	NA	NA	
6							

NOTES:

R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Instrument	Serial #	Background
HNU Meter	711111	Ø
β/γ Meter	85665	40-60
α Meter	NO METER at office	

Samples collected per ASTM Colors identified using Munsell Color Chart

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: est 586.5	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 3 OF 12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BGM 1-14-92)
	1-9-92 0900 100872	12 1-14-92 BGM	6	HARD (10YR 7/4) very pale Brown Silty clay with Some Sand (very fine) No plasticity, DRY	Cl	4.5	HNU = Ø ppm Bγ = Ø cpm above Background
	1	13	6	A/A	Cl	4.5	
7		19	6	HARD (10YR 6/8) brownish yellow, Sandy-Silty Clay (Sand fine to very fine) No plasticity, DRY	Cl	4.5	
		9	0	No Recovery	NA	NA	
8	RS.100874 1-9-92	Shelby Tube	20	HARD (10YR 5/3) BROWN MODIE with (5YR 5/8) yellowish RED, silty Clay No plasticity, Slightly moist	Cl	4.5	HNU = ØPPM Bγ = Ø cpm above Background. Rig Down — Broken nipple on pump. could only push Shelby ~~to 10.5~~ 2.5 feet. - from 8.0 to 10.5 ft
9	945 100873						
10							
10.5	RS.100875						

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	Ø
Bγ Meter	85665	40-60
α Meter	ND	

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: Est. 586.3	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST: G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 4 OF ~~10~~ 12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BZm 1-14-92)
10.5	1-9-92 1352 100876	18	6	HARD (10YR 5/4) yellowish Brown Silty Clay with some Sand. Trace of gravel, No Plasticity Slightly moist.	Cl	4.0	HNU = Ø ppm By = Ø above Back ground.
11		18	6	A/A (10YR 5/3) Brown.	Cl	4.5	END of weathering zone.
	1-9-92 1352 100877	24	6	VERY HARD (5Y 4/1) Dark gray, Silty Clay with some coarse gravel No plasticity, Slightly moist	Cl	4.5	
12		26	6	A/A	Cl	4.5	
	1-9-92 1358 100878	30	6	VERY HARD (5Y 4/1) Dark gray, Silty-Sandy (Very fine sand) clay No plasticity, Slightly moist (Lime stone cobble was at the end of split spoon)	Cl	4.5	HNU = Ø ppm By = Ø above Back ground
13		34	2	A/A	Cl	4.5	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech. Vern Larger

Instrument	Serial #	Background
HNU Meter	711111	Ø
By Meter	85665	40-60
α Meter	ND	

Samples collected per ASTM Colors identified using Munsell Color Chart

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: est 586.5	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 5 OF ~~10~~ 12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (HEM 1-14-92)
14		32	0	NO RECOVERY	NA	NA	
		32	0	NO RECOVERY	NA	NA	
	1-9-92 100879 1420 Total U Gamma Spec	22	6	VERY HARD (5Y 4/1) Dark gray, silty Clay with Little Sand & grave/ No plasticity, slightly moist	CI	4.5	HNU = Ø ppm Bγ = Ø cpm above Background
15		26	6	A/A	CI	4.5	ARCHIVE 1 500 ML #100880 AND SEND 1 500 ML to RSL Lab for Total U/Gamma Spec sample #100879
		28	6	A/A	CI	4.5	
16		32	6	HARD A/A	CI	3.75	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Instrument	Serial #	Background
HNU Meter	711111	Ø
Bγ Meter	85665	40-60
α Meter	NO	

Samples collected per ASTM Colors identified using Munsell Color Chart

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS - (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: Gt. 546.5	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 6 OF 12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BEM 1-14-92)
	1-9-92 100881 1430	22	6	HARD (5Y 4/1) DARK gray, silty clay with Traces of Sand & gravel, No Plasticity, Slightly Moist.	Cl	3.5	HNU = Ø ppm By = Ø cpm above Back ground
17	RS 100885						
	100882 1430	27	6	A/A	Cl	3.5	
	R.S. 100886						
	100883 1430	38	6	VERY HARD A/A	Cl	4.5	
18	R.S. 100887						
	100884 1430	38	6	A/A.	Cl	4.5	
	R.S. 100888						
	100889 1522 1-9-92	6	6	VERY HARD (5Y 4/1) Dark gray, Silty Clay with Little of Sand & gravel, No plasticity, slightly moist	Cl	4.5	HNU = Ø PPM By = Ø cpm above Back ground.
19							
	100891 1522 1-9-92	13	6	A/A	Cl	4.0	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	Ø
By Meter	85665	40-60
∝ Meter	NO	

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE: 1-9-92
ELEVATION: Gr. 586.6	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST: G.R.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 7 OF ~~to~~ 12

DEM 1-14-92

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		14	2	A/A	CI	4.0	
20		21	0	NO RECOVERY	NA	NA	
		12	6	Limestone cobbles		NA	HNU = Ø ppm Bγ = Ø cpm above Background
21	1531 100889 1-9-92	36	6	HARD (5Y 4/1) Dark gray, Silty Clay, with Little sand & gravel No plasticity, slightly moist.	CI	3.0	Put cobbles in waste Drum.
		28	0	NO RECOVERY	NA	NA	
22		28	0	NO RECOVERY	NA	NA	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech. Vern Larger

Instrument	Serial #	Background
HNU Meter	711111	Ø
Bγ Meter	85665	40 -60
α Meter	ND	

Samples collected per ASTM Colors identified using Munsell Color Chart

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: ~~92~~ 546.5'	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 8 OF ~~10~~ 12

1-14-92

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1600 1-9-92	23	0	NO RECOVERY	NA	NA	
23		22	0	NO RECOVERY	NA	NA	
		20	0	NO RECOVERY	NA	NA	
24		21	0	NO RECOVERY	NA	NA	
	1620 1-9-92 100890	24	6	Very soft (5Y 4/1) DARK GRAY, Clayey Sand, Slightly MOIST (VERY fine Sand)	SC ~~CL~~ CH 01/23/92	<.25 ~~<.25~~	HNU = Ø ppm BY = Ø cpm above Background.
25		34	6	A/A	SC ~~CL~~ CH 01/23/92	<.25 ~~<.25~~	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
BY Meter	85665	40-60
∝ Meter	ND.	

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: 586.5 est	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST: G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 9 OF 10-12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		44	0	NO RECOVERY	NA	NA	
26		12	0	NO RECOVERY	NA	NA	
	1630 100890 1-9-92	4	6	VERY soft (5Y 4/1) Dark gray clayey SAND (SAND VERY fine)	SC	<.25 ~~.25~~ CH 01/23/92	HNU = Ø ppm BY = Ø cpm above Back ground
27		4	8 2	HARD SILTEM (5Y 4/1) Dark gray Silty Clay with a Little sand & gravel, Low Plasticity, moist	CI	3.0	
		12	0	NO RECOVERY	NA	NA	
28		18	0	NO RECOVERY	NA	NA	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
BY Meter	85665	40-60
∝ Meter	ND.	

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1730	COORDINATES:	DATE 1-9-92
ELEVATION: est 589.15	GWL: Depth Date/Time	DATE STARTED: 1-9-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-9-92
DRILLING METHODS: AUGER		PAGE 10 OF 10/12

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 Inches)	RECOVERY (In.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BEA 1-14-92)
	1700 10089 RS100892	10	6	Very Soft (5Y 4/1) Dark gray Silty Clay with a Little sand and gravel, MEDIUM plasticity very moist	CI	2.25	HNU = Ø ppm βγ = Ø cpm above Background
29		13	0 (PM 01/23/92) 6	NO RECOVERY	NA	NA	
		15	0	NO RECOVERY	NA	NA	
30		18	0	NO RECOVERY	NA	NA	
				Bottom of Boring at 30.5 ft.			
				Composite drum Sample 1x500ml & 1x40ml to RSI Lab. Sample # 100893 1x500ml to WEMCO Sample NO. 100894			

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor: PENN DRILLING

Drilling Equipment: MOBIL DRILLING RIG 80

Driller: John Strapzzon, Kevin Myers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

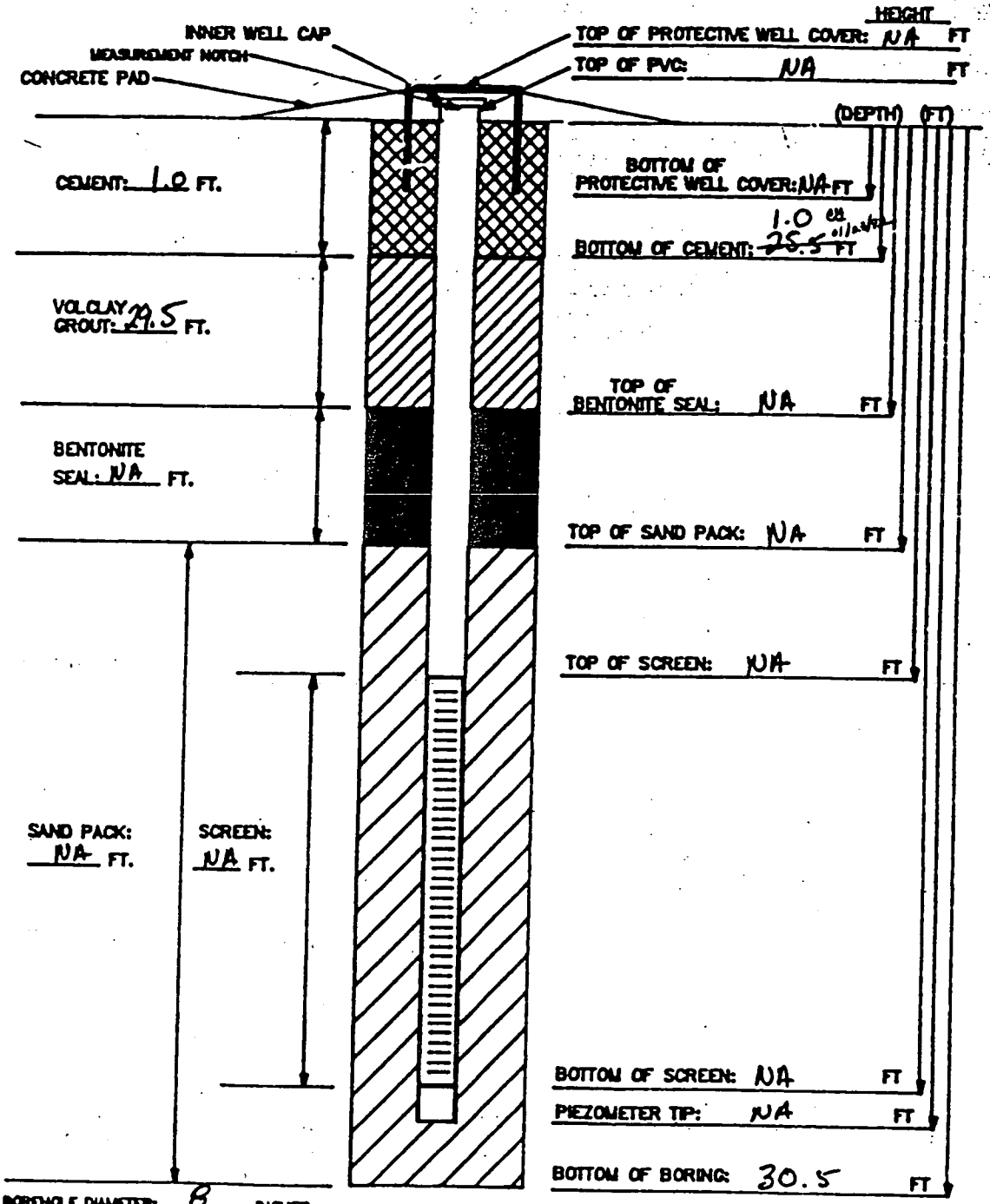
Instrument	Serial #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	NO	—

402-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1730

INSTALLATION DATE: 1-9-92 1000



MATERIALS USED:

SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1.5 sks
AMOUNT OF CEMENT: .5 sks
AMOUNT OF WATER USED: 40 gals
OTHER: NONE

NOTES:

1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22

GEOLOGIST/ENGINEER: M Emarshall

FERNALD RI/FS

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS (EWMF) FIELD ENG./GEO. HE Marshall DATE 1-14-92
PROJECT NO. 9602.3.22 CHECKED BY Cotrulu DATE 01/23/92
BORING NO. 1730
PIEZOMETER NO. NA DATE OF INSTALLATION NA

BOREHOLE DRILLING

DRILLING METHOD Auger (Hollow)	TYPE OF BIT Auger Bit.
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM — TO —	SIZE NA FROM — TO —
FLUID NA FROM — TO —	SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	NA		NA	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA		NA	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1	BOTTOM 30.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
SAND	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
GRAVEL	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PIEZOMETER TIP	NA		NA	
BOTTOM OF BOREHOLE	30.5			
GWL AFTER INSTALLATION	NA		NA	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? NA YES ☐ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? NA YES ☐ NO ☐
REMARKS 1.0 ft cement from 0.0 to 1.0 ft

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FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: 2171	COORDINATES:	DATE: 1-14-92	
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92/1015	DATE STARTED: 1-14-92	
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 1-23-92	
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 1 OF 8 10	

KM, 1-28-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0 – 1.2	1-14-92 1003 38000	3 6 9	14	Very Stiff light yellowish brown (2.5Y, 6/4) CLAYEY SILT with Sand and trace fine gravel, some organic matter, moist	ML	2.75	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
1.5 – 2.7	1-14-92 1010 38001	5 5 9	14	Very Stiff light olive brown (2.5Y, 5/4) SILTY CLAY with yellowish brown (10YR, 5/6), dark brown (10YR, 3/3) and light olive gray (5Y, 6/2) mottling, damp, medium plasticity	CL	2.5	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
3.0 – 4.2	1-14-92 1013 38002	8 11 12	14	Very Stiff light olive brown (2.5Y, 5/4) SILTY CLAY with trace organic matter, moist, low plasticity	CL	2.0	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
4.5 – 5.8	1-14-92 1016 38003	8 9 9	16	Stiff light olive brown (2.5Y, 5/4) SILTY CLAY with a little yellowish brown (10YR, 5/6), dark brown (10YR, 3/3) and light olive gray (5Y, 6/2) mottling, moist, low plasticity	CL	1.25	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
6.0 – 6.5	1-14-92 1020 38004	7 5	12	Loose light olive brown (2.5Y, 5/4) CLAYEY medium sand, wet	SC	N/A	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
6.5 – 7.0 – 7.5		5		Hard light gray (5Y, 6/1) CLAY, damp, low plasticity	CL	4.0	

NOTES

Drilling Company: Pennsylvania Drilling
Driller: Dave Newman
Assistant Driller: Bob Johnson

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

Hnu S/N: A01336 .2 ppm
Bγ S/N: 50760 30 cpm
α S/N: 50768 0 cpm
} Background Levels

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FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2171	COORDINATES:	DATE: 1-14-92
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92 / 1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 2 OF ~~8~~ 10

K.M. 1-24-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	1-14-92 1115 38005	7 13 21	18	Very soft light olive brown (2.5Y, 5/4) SANDY CLAY, wet, low plasticity	CL	<.25	Hnu = .2 ppm Br = 30 cpm α = 0 cpm
9.0	1-14-92 1120 38006	18 19 21	18	Dense light olive brown (2.5Y, 5/4) CLAYEY SAND, wet	SC	N/A	Hnu = .2 ppm Br = 30 cpm α = 0 cpm
10				Very stiff light olive brown (2.5Y, 5/4) CLAYEY SILT, moist	ML	3.0	
10.5	1-14-92 1430 38007	16 39 50	14	Hard gray (5Y, 5/1) CLAY with sand and gravel, slightly moist, non plastic	CL	4.5	Hnu = .2 ppm Br = 30 cpm α = 0 cpm Hit a cobble
11.7 12 12.6	1-14-92 1447 38008	5 6 12	7	Very stiff gray (5Y, 5/1) SILTY CLAY with sand and gravel, moist, non plastic	CL	3.0	Hnu = .2 ppm Br = 30 cpm α = 0 cpm
13.5	1-14-92 1455 38009	3 7 10	18	Stiff gray (5Y, 5/1) SILTY CLAY with sand and gravel, moist, medium plasticity	CL	1.5	Hnu = .2 ppm Br = 30 cpm α = 0 cpm
15.0							

NOTES

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2171	COORDINATES:	DATE: 1-14-92
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92 / 1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 3 OF ~~8~~ 10

1-24-92 KM.

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15.0	1-14-92 1510 38010	3 7 8	10	Stiff gray (5Y, 5/1) SILTY CLAY with sand and gravel, a few wood fragments, moist, medium plasticity	CL	1.5	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
15.83							
16.5	1-14-92 1525 38011	4 9 12	18	Stiff gray (5Y, 5/1) SILTY CLAY with sand and gravel, moist medium plasticity	CL	2.0	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
18	1-14-92 1531	3 5 7	0	No Recovery	N/A	N/A	
19.5	1-14-92 1695 38012	6 13 21	12	Very stiff olive gray (5Y, 5/2) SILTY CLAY with sand and fine gravel, slightly moist, low plasticity	CL	3.75	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
20.5							
21	1-14-92 1650 38013	6 13 18	12	Same as above	CL	3.75	Hnu = .2 ppm Bγ = 30 cpm α = 0 cpm
22							
22.5							

NOTES

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 6023.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2171	COORDINATES:	DATE: 1-14-92
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92 / 1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Len Marion	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 4 OF 9/10

K.M. 1-24-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
22.5	1-14-92 1702 38014	8 7 13	15	Very stiff olive gray (5Y, 5/2) SILTY CLAY with sand and fine gravel, slighty moist, low plasticity	CL	2.5	Hnu = .2 ppm Br = 30 cpm α = 0 cpm
23.75 24	1-14-92 1715 38015	8 8 10	7	Very stiff gray (5Y, 5/1) and some olive (5Y, 4/4) SILTY CLAY with sand and a little gravel, slightly moist, low plasticity	CL	2.5	Hnu = .2 ppm Br = 30 cpm α = 0 cpm
24.6 25.5	1-15-92 0920 38016	7 9 11	14	Medium dense light olive brown (2.5Y, 5/4) SAND with a little clay and gravel, moist	SC	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
26.7 27	1-15-92 0930 38017	5 6 6	16	Medium dense light olive brown (2.5Y, 5/4) SAND with ~~trace a little~~ clay and a little gravel, K.M. 1-15-92 moist	SC	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
28.3 28.5	1-15-92 0940 38018	6 9 11	12	Medium dense light yellowish brown (2.5Y, 6/3) SAND with trace gravel, dry	SW	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm Soil Samples will be collected at 5 ft. intervals Next Sample at 35 ft.
30							

NOTES

1/15/92

Hnu: .2 ppm
Br: 20 cpm
α: 0 cpm
} Background Levels

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FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2171	COORDINATES:	DATE: 1-15-92
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92/1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: CABLE Tool 10" drill bit		PAGE 5 OF ~~8~~ 10

K.M. 1-24-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
35							
36.38 36.5	1-15-92 1106 38019	12 22 48	16	Very dense light yellowish brown (2.5Y, 6/3) well graded SAND with trace gravel, dry	SW	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
40							
41.2 41.5	1-15-92 1315 38020	8 11 13	14	Medium dense light yellowish brown (2.5Y, 6/3) medium SAND, dry	SP	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
45				Very K.M. 1-15-92 ~~Medium~~ dense light yellowish brown (2.5Y, 6/3) Medium SAND with trace gravel, dry			
46.0 46.5	1-15-92 1415 38021	28 50	12		SP	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
50							

NOTES

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	K.M. 1-15-92
BORING NUMBER: 2171	COORDINATES:	DATE: 1-15-92
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92 1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Ken Marson	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: CABLE Tool 10" drill bit		PAGE 6 OF 8/10

K.M. 1-24-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
50							
51.0 51.5	1-15-92 1430 38022	39 50	12	Very dense light brownish gray (2.5Y, 6/2) GRAVELLY SAND, dry	SW	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
55							
56.0 56.5	1-15-92 1540 38023	39 50	12	Very dense light brownish gray (2.5Y, 6/2) GRAVELLY SAND, moist	SW	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
60							
61.0 61.5	1-15-92 1700 38024	23 50	K.M. 1-15-92 ~~13~~ 12	Very dense light brownish gray (2.5Y, 6/2) GRAVELLY SAND, moist	SW	N/A	Hnu = .2 ppm Br = 20 cpm α = 0 cpm
63.85 65				Water Level ▽			water Level = 63.85 ft. below ground surface on 1-24-92 at 1015

NOTES

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2171	COORDINATES:	DATE: 1-21-92
ELEVATION:	GWL: Depth 63.85 ft Date/Time 1-24-92 / 1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 7 OF 8/10

K.M. 1-24-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
65	1-21-92 1406 38025	6 7 13	18	Medium dense grayish brown (2.5Y, 4/2) well graded SAND with a little fine gravel, wet	SW	N/A	Hnu = .2 ppm Bγ = 20 cpm α = 0 cpm
66.5							
70	1-21-92 1515 38026	5 11 12	18	Medium dense grayish brown (2.5Y, 5/2) well graded SAND with fine gravel, wet	SW	N/A	Hnu = .2 ppm Bγ = 20 cpm α = 0 cpm
71.5							
75	1-21-92 1602 38027	6 9 13	8	Medium dense grayish brown (2.5Y, 5/2) well graded SAND with a little fine gravel, wet	SW	N/A	Hnu = .2 ppm Bγ = 20 cpm α = 0 cpm a piece of gravel was lodged in the shoe
75.7							
76.5							
80							

NOTES:

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/F	
BORING NUMBER: 2171	COORDINATES:	DATE: 1-21-92
ELEVATION:	GWL: Depth 63.85 Date/Time 1-24-92 1015	DATE STARTED: 1-14-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 1-23-92
DRILLING METHODS: CABLE Tool, 10" drill bit		PAGE 8 OF 8/10

KM 1-24-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
80	1-21-92 1700 38028	3 6 11	18	Medium dense grayish brown (2.5Y, 5/2) well graded gravelly SAND, wet	SW	N/A	Hnu = .2 ppm BT = 20 cpm α = 0 cpm
81.5				Bottom of Bore Hole Drilled to a depth of 80 ft, Split spoon sampled to a depth of 81.5 ft.			

NOTES

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS Misc Wells
BORING NUMBER: 2679	COORDINATES:
ELEVATION:	GWL: Depth 6.8 Date/Time 1-21-92 0910
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time
DRILLING METHODS: Cable Tool	

DATE: 1-13-92
DATE STARTED: 1-13-92
DATE COMPLETED: 1-22-92
PAGE 1 OF 13

DEPTH (ft)	SAMPLE TYPE & NO (JL 1-15-92)	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
	38266 1500 1-12-92	3 6 8	14	m. dense, dark brown (10yr, 3/3) clayey silt, some organics, moist.	ML	NA	Hnu 0 ppm; Bd 50cpm; α 0cpm
2	38267 1505 1-13-92	3 6 8	15	~~m. dense~~ stiff, yellowish brown, 10yr, 5/6 silty clay, trace gravel, low plasticity, moist.	CL	1.75	Hnu - 0 ppm; Bd - 50cpm; α - 0cpm
3 4	38268 1510 1-13-92	8 15 18	15	S.A.A. med plasticity.	CL	1.75	Hnu - 0 ppm; Bd - 50cpm; α - 0
5 6	38269 1515 1-13-92	13 14 12	14	v. stiff, brown, (10yr, 5/3) silty clay, some gravel, low plasticity, moist	ML	NA	Hnu - 0 ppm; Bd - 50cpm; α - 0cpm
7	38270 1530 1-13-92	9 12 14	14	S.A.A	ML	NA	Hnu - 0 ppm; Bd - 50cpm; α - 0cpm

NOTES
Drilling Contractor - Penn Drilling
Drilling Equipment - Cyclone 43
Driller - Craig Coulter.
Asst. - Gary Dye

S.A.A. - Same As Above

N.R. No Recovery

Background
Hnu - 0 ppm
Bd - 40 cpm
α - 0 cpm

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER 602.3.22	PROJECT NAME FEMP RI/FS Misc Wells		
BORING NUMBER 2767 2679 J.L 1-14-92	COORDINATES:	DATE 1-13-92	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED 1-13-92	
ENGINEER/GEOLOGIST J. Lear	Depth Date/Time	DATE COMPLETED 1-22-92	
DRILLING METHODS Cable Tool		PAGE 2	OF 13

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8	38271 1535 1-13-92	22 44 50	0	N.R	NA	NA	Hnu Bg α NA
9 10	38272 1550 1-13-92	12 23 31	16	Hard, brown to grayish brown (10yr, 5/3 to 10yr, 5/2) silty clay. Some gravel, Some mottling, sl. moist, low plasticity	CL	>4.5	Hnu - 0 ppm Bg - 50 cpm α - 0 cpm
11 12	38273 1555 1-13-92	26 31 36	12	V. stiff, gray, (10yr, 5/1) silty clay, Some gravel, some mottling, low plast. moist.	CL	2.0	Hnu - 0 ppm Bg - 50 cpm α - 0 cpm
13	38274 1600 1-13-92	13 23 23	0	N.R.	NA	NA	Hnu Bg α NA
14 15	38275 1605 1-13-92	14 22 24	15	Stiff, gray, (10yr, 5/1) silty clay, trace gravel, low plast., moist.	CL	1.0	Hnu - 0 ppm Bg - 40 cpm α - 0 cpm

NOTES see page 1

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS Misc. Wells		
BORING NUMBER: 2679	COORDINATES:	DATE 1-13-92	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED 1-13-92	
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED 1-22-92	
DRILLING METHODS: Cable Tool		PAGE 3	OF 13

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (tsf)	REMARKS
16	38276 1650 1-13-92	3 8 11	16	Stiff, olive gray, ~~10yr~~ (5Y, 5/2) silty clay, trace gravel, low plast., moist	CL	1.75	Hnu - 0 ppm Bf - 40 cpm α - 0 cpm
17 18	38277 1700 1-13-92	50/2	1	Stiff, olive gray, (5Y, 5/2) silty clay. Some gravel, low to mid plasticity, moist.	CL	1.25	Hnu - 0 ppm Bf - 50 cpm α - 40 cpm
19	38278 1715 1-13-92	13 24 34	0	NR.	NA	NA	Hnu Bf α NA
20 21	38279 1720 1-13-92	18 23 28	10	Stiff, olive gray to gray, (5Y, 5/2) to (10yr, 5/1) silty clay, trace gravel, low to mid plasticity, moist.	CL	1.5	Hnu 0 ppm Bf 40 cpm α 0 cpm
22	38280 1000 1-14-92	18 25 38	12	Stiff, olive gray, (2.5Y, 5/2) silty clay, some gravel moist.	CL	2.5	Hnu 0 ppm Bf 50 cpm α 0 cpm

NOTES see page 1

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS Misc Wells		
BORING NUMBER: 2679	COORDINATES:		
ELEVATION:	GWL: Depth Date/Time	DATE: 1-14-92	
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE STARTED: 1-13-92	
DRILLING METHODS: Cable tool		DATE COMPLETED: 1-22-92	
		PAGE 4	OF 13

DEPTH (Ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
23	38281 1045 1-14-92	12 24 31	13	S.A.A.	CL	2.5	Hnu - 0 ppm; Bg - 50cpm; α - 0 cpm
24 25	38282 1055 1-14-92	17 42 50/4	14	Hard, dark gray, (5Y, 4/1) silty clay, some gravel, low plasticity, moist.	CL	4.25	Hnu - 0 ppm; Bg - 40 cpm; α - 0cpm
26 27	38283 1105 1-14-92	50/3	2	Hard, Dark gray, (5Y, 4/1) silty clay some large gravel inhibiting recovery, low Plast., moist.	CL	4.25	Hnu - 0ppm; Bg - 50cpm; α - 0cpm
28	38284 1115 1-14-92	10 11 9	10	v. stiff, gray to Dark gray (10yr, 5/1 to 2.5Y, 5/2) silty clay, laminar gravel (Poorly graded mud) 1.5in, some sand, moist.	CL	2.25	Hnu - 0ppm; Bg - 50cpm; α - 0cpm
29 30	38285 1120 1-14-92	10 5 7	0	N.R.	NA	NA	Hnu - Bg - α - NA

NOTES see page1

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOIL

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS Misc. Wells		
BORING NUMBER: 2679	COORDINATES:	DATE: 1-14-91	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED:	1-13-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED:	1-22-92
DRILLING METHODS: Cable tool		PAGE 5	OF 13

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
31	38286 1415 1-14-92	3 6 6	0	N.R.	NA	NA	Hnu - Bb - α - NA
32	38287 1425 1-14-92	5 5 8	8	Stiff, olive ~~brown~~ gray, (5Y. 4/2) silty clay, some sand, trace gravel, low plast. moist.	CL	1.75	Hnu - 0 ppm Bb - 50 cpm α - 0 cpm
33	38288 1430 1-14-92	5 7 8	10	Soft, olive gray (5Y. 4/2) sandy silty clay, trace gravel, low plasticity, moist	CL	.6	Hnu - 0 ppm Bb - 50 cpm α - 0 cpm
34	38289 1435 J.L. 1-14-92	2 3 4	8	S.A.A. except some sand	CL	.6	Hnu - 0 ppm Bb - 50 cpm α - 0 cpm J.L 1-14-92
36	38290 1445 1-14-92	5 6 14	12	S.A.A.	CL	.75	Hnu - 0 ppm Bb - 50 cpm α - 0 cpm
37				36.75 med dense, olive gray, (5Y. 4/2) clayey silty sand, poorly graded, fine, moist.	SP	NA	

NOTES See page 1

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOI

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: 2679	COORDINATES:	TE: 1-14-92	
ELEVATION:	GWL: Depth Date/Time	RE STARTED: 1-13-92	
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	TE COMPLETED: 1-22-92	
DRILLING METHODS: Cable Tool		GE 4 6	OF 13

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
38	38291	9		S.A.A	SP	NA	Hnu - 0 ppm
	1500	10	11	38.25 med dense, olive gray (5Y 5/2) poorly graded fine sand, some clay, some silt, moist.	SP	NA	Gr - 50 cpm
39	1-14-92	12					α - 0 cpm
40				Sand And Gravel Aquifer met at 37.75' samples will be taken every five feet beginning at 45.0ft			
41							
42							
43							
44							
45							

NOTES See pg 1

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOI

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS Misc Wells		
BORING NUMBER: 2679	COORDINATES:		TE: 1-14-92
ELEVATION:	GWL: Depth	Date/Time	TE STARTED: 1-13-92
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	TE COMPLETED: 1-22-92
DRILLING METHODS: Cable Tools			GE 7 OF 13

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
45	38292	4		med dense, olive, (2.5Y, 4/3) poorly graded sand, trace gravel, moist.	SP	NA	BNU - 0 ppm
46	1540	4	12				BG - 50 cpm
	1-14-91	8					α - 0 cpm
47							
48							
49							
50	38293	4		med dense, grayish brown, (2.5Y, 5/2) Slayey silt to silty clay, No to med to high plasticity, moist to saturated	ml/cl	NA 1.0	BNU - 0 ppm
51	1610	6	16				BG - 50 cpm
	1-14-91	6					α - 0 cpm
52							

NOTES see page 1

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FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOI

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS
BORING NUMBER: 2679	COORDINATES:
ELEVATION:	GWL: Depth Date/Time
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time
DRILLING METHODS: Cable tool	

TE 1-14-92
E STARTED: 1-13-92
E COMPLETED 1-22-92
E 8 OF 13

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
53							
54							
55	38294	7		Stiff, gray, (10yr. 5/1) clayey silt to silty clay. Low to high plasticity, 1in. laminar sand at 56.25, moist.	ml/cl	No/	Hnu - 0 ppm
	1625	14	16				Bz - 50 ppm
56	1-14-92	22					O - 0 ppm
57							
58							
59							
60							

NOTES see page 1

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3-22	PROJECT NAME: FEMP RI/FS Misc Wells		
BORING NUMBER: 2679	COORDINATES:	DATE	1-15-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED:	1-13-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED	1-22-92
DRILLING METHODS: Cable Tool		PAGE 9	OF 13

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
60	38295	22	13	Dense, dark gray, (2.54, 411) silt, some sand, moist.	ML	NA	Hnu - 0 ppm
	0945	44		~0.75			BD - 50 cpm
61	1-15-92	50/4		Dense, gray, (10yr, 611) poorly graded fine sand, some silt, sl. moist.	SP	NA	α - 0 cpm
62							
63							
64							
65	38296	4	13	V. Dense, dark grayish brown, poorly graded sand, trace gravel, V. moist. (2.54, 412)			Hnu - 0 ppm
	1000	6					BD - 50 cpm
66	1-15-92	42					α - 0 cpm
67							

NOTES see page 1

VISUAL CLASSIFICATION OF SOIL

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2679	COORDINATES:	DATE: 1-15-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-13-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 1-22-92
DRILLING METHODS: Cable tool		PAGE 10 OF 13

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
68							
69							
70	3B297	16		V. Dense, olive gray, (5Y 4/2) poorly graded sand, some gravel, trace silt, saturated			
71	1120	31	14		SP	NA	Hnu - 0 ppm BZ - 50 cpm α - 0 cpm
	1-15-92	30					
72							
73							
74							
75							

NOTES See pg 1

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2679	COORDINATES:	DATE: 1-15-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-13-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 1-22-92
DRILLING METHODS: Cable Tool		PAGE 11 OF 13

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
75				J.L 1-15-92			
	38298	14		~~med~~ dense, olive gray (5Y 4/2) poorly graded fine sand, some silt, wet.	SP	NA	Hnu - 0 ppm
	1440	15	14				Bd - 50 cpm
76	1-15-92	22					α - 0 cpm
77							
78							
79							
80	38299	13		Dense, olive gray (5Y 5/2) poorly graded sand, some silt to silty sand, trace gravel, wet.			Hnu - 0 ppm
	1500	15	15				Bd - 50 cpm
81	1-15-92	21					α - 0 cpm
82				Drilling ends at 80.0 ft Sampling ends at 81.5 ft			

NOTES

38300 - Total U. ~~Total Thorium~~ J.L 1-24-92, WEMCO

38301 - Total U. Total Thorium - IT

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FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)	
BORING NUMBER: 1738	COORDINATES: N 483,539 E 1,302,635	DATE 1-2-92
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92
ENGINEER/GEOLOGIST: G.MARSHALL	Depth Date/Time	DATE COMPLETED: 1-4-92
DRILLING METHODS: AUGER		PAGE 1 OF 9/11

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1-2-92 100782 9:00	3	6	Stiff (10YR 3/2) Dark grayish Brown Silty Clay, Low plasticity, [redacted], w Root Lets	[redacted] Cl	1.5	#100783 TRIP Blank HNU Ø PPM BG Ø CPM above Background
	1-2-92 100784 9:30	2	6	Stiff (10YR 3/4) Dark yellowish Brown, Clay with traces of Sand, Low plasticity, moist w Traces of Root Lets.	Cl	1.5	
1		4	18 1-4-92 6	A/A	Cl 2.0	2.0	
		5	0	No Recovery	NA	NA	
2	1-2-92 1000 100785	2	6	Stiff. (10YR 5/6) yellowish brown Sandy Clay, Low plasticity, Slightly moist.	Cl	1.75	HNU Ø PPM BG Ø CPM above. Background
		6	0	No Recovery	NA	NA	
3							

NOTES:

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~BOBBY YOST~~ John Strapzzon

KEVIN MYERS

Sample Tech. VERN LARGER

HNU Background Ø PPM
BG Background 40-60 CPM

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)		
BORING NUMBER: 1738	COORDINATES: N 483,539 E 1,382,635	DATE 1-2-92	
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92	
ENGINEER/GEOLOGIST: G.MARSHALL	Depth Date/Time	DATE COMPLETED: 1-4-92	
DRILLING METHODS: AUGER		PAGE 2 OF 911	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (BCM 1-14-92)
		9	0	No Recovery	NA	NA	
		11	0	No Recovery	NA	NA	
4	1-2-92 1015 100786 Rad SCREEN 100790	13	6	Very stiff (10YR 5/4) yellowish Brown, gravelly to sandy Clay no plasticity, slightly moist.	Cl	3.0	HNU = Ø ppm BK = Ø cpm above Back ground.
5	1-2-92 100787 1015 RS 100791	19	6 (1-14-92 BCM 24)	HARD (10YR 5/4) yellowish Brown Gravelly to Sandy Clay, No Plasticity, slightly moist	cl	4.5	
	1-2-92 100788 1015 RS 100792	20	6	A/A	cl	4.5	
6	1-2-92 100789 1015 RS 100793	26	6	A/A	cl	4.5	

NOTES:

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~BOBBY YOST~~ John Strapzzon

KEVIN MYERS

Sample Tech. VERN LARGER

A/A = As Above

*RS = Rad SCREEN

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602.3.22	PROJECT NAME: FERNALD RI/FS (EWMF)		
BORING NUMBER: 1738	COORDINATES: N 483,539 E 1,392,635	DATE 1-2-92	
ELEVATION: 616.51	GWL: Depth Date/Time	DATE STARTED: 1-2-92	
ENGINEER/GEOLOGIST: G.MARSHALL	Depth Date/Time	DATE COMPLETED: 1-4-92	
DRILLING METHODS: AUGER		PAGE 3 OF 9 11	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (JSM 1-14-92)
	1-2-92 1027 100794	32	6	HARD (10YR 5/4) yellowish Brown gravelly Clay, No plasticity Slightly moist. modied w/gray	Cl	4.5	HNU ∅ PPM Bg ∅ CPM above Back ground
	100795 1027 1-2-92	27	6	VERY LOOSE (10YR 5/4) yellowish Brown Sand (Fine - coarse) moist	SW	NA	CH 01/02/92
	100796 1027 1-2-92			HARD (10YR 5/4) yellowish Brown silty Clay, No Plasticity. moist.	Cl	4.5	
7		31	6	HARD (10YR 5/4) yellowish Brown gravelly Clay, No Plasticity Slightly moist w Limestone cobble.	Cl	4.5	Limestone cobble was at the end of spoon.
		39	0	No RECOVERY	NA	NA	
8	1-2-92 1100 100797 Archive	Shelby tube		HARD (10YR 5/4) yellowish Brown gravelly clay, Low Plasticity, Slightly moist w coarse gravel at the end of tube (Trace)	Cl	4.5	Could only push Shelby tube to 10.5' HNU ∅ PPM Bg ∅ CPM above Background
9			12				
							Archive Sample in 1000 ml Jar.
10							

NOTES:

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~BOBBY YOST~~ John Strapzzon

KEVIN MYERS

Sample Tech. VERN LARGER

402-11-88

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1238	COORDINATES: N 483,539 E 1,382,635	DATE 1-2-92
ELEVATION: 616.51	GWL: Depth Date/Time	DATE STARTED: 1-2-92
ENGINEER/GEOLOGIST. G.MARSHALL	Depth Date/Time	DATE COMPLETED: 1-4-92
DRILLING METHODS: AUGER		PAGE 4 OF 9/11

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		Shelby Tube					
10.5	1-2-92 1300 100798	11	6	HARD (10YR 5/4) yellowish Brown gravelly clay, Low plasticity, slightly moist w TRACE of COARSE gravel.	Cl	4.5	HNU = Ø ppm Bγ = Ø cpm above Background
11		15	6 (BEN 1-14-92)	A/A	Cl	4.5	*Pushed 3" split spoon w 18" of Recovery.
		18	6	Stiff (10YR 5/4) yellowish Brown Sandy clay (sand very fine) Low plasticity, moist. Lower 1" with gray clay	Cl	1.5	~~End of weathering zone.~~
12	1-2-92 1330 100799	RS 100800 Shelby tube	(18) (18)	(10YR 5/1) gray, clay, High plasticity moist.	Cl	NA	HNU = Ø PPM Bγ = Ø CPM above Background
13							
14				Firm (10YR 5/4) yellowish Brown, Sandy Clay (sand very fine) Low Plasticity, moist			
15	RS 100801				Cl	2.0	

NOTES:

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~BOBBY YOST~~ John Strapezzon

KEVIN MYERS

Sample Tech. VERN LARGER

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1738	COORDINATES: N 473,539 E 382,685	DATE 1-4-92
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-4-92
DRILLING METHODS: AUGER		PAGE 5 OF 9

DEPTH 1-4-92	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 (IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS DER 1-14-92
	1-4-92 830 100802 Total U	3	6	Very soft (10YR 5/4) yellowish Brown Sandy clay (sand very fine) Low plasticity, moist.	Cl	<.25 ~~<.25~~ CB 01/24/92	NNU = Ø PPM BG = Ø cpm above Background
		5	6	Firm (A/A)	Cl CB 01/24/92	1.5	Archive 1-500 mL Sample #100803
16		5	6	Firm (5Y 4/1) Dark gray, clay with some sand & gravel, High plasticity, moist	Cl	1.0	16.0 FT End of weathering zone
		9	6	A/A	Cl	1.5	
17	1-4-92 847 100803	7 5	6	Soft (5Y 4/1) Dark gray clay with some sand & gravel, High plasticity, moist.	Cl	.5	NNU = Ø PPM BG = Ø cpm above Background
		7	4	A/A	Cl	.5	Archive sample. 1-500 mL
19							

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: DER ~~Bobby Yost~~ John Strapazzon

Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	731111	Ø PPM
BG Meter	85665	40-60 cpm
α Meter	No meter at office	

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)		
BORING NUMBER: 1738	COORDINATES: N483,539 E1,382,638	DATE 1-4-92	
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92	
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-4-92	
DRILLING METHODS: AUGER		PAGE 6 OF 11	

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6"	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
18		6	0	NO RECOVERY	NA	NA	
		9	0	NO RECOVERY	NA	NA	
19	1-4-92 855 100803	7	6	VERY soft (5y 4/1) Dark gray clay with Some Sand & gravel, High Plasticity, moist.	CI	<.25 ~~.25~~ CH 01/22/92	HNU = Ø ppm Bg = Ø cpm above Background
		9	6	A/A.	CI	.5	Archive 1-500 ml sample # 100803.
20		9	0	NO RECOVERY	NA	NA	
		10	0	NO RECOVERY	NA	NA	
21							

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~Bobby Yost~~ John Strapzzon

Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
Bg Meter	85665	40-60 cpm
α Meter	NA	—

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1738	COORDINATES: N 483,539 E 1382[illegible]	DATE 1-4-92
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-4-92
DRILLING METHODS: AUGER		PAGE 7 OF 9 11

BPM 1-14-92

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21	1-4-92 915 100804 RS 100805	3		Very soft (5Y 5/1) gray; clay with some sand & gravel, high plasticity moist.	CI	.5	NNU = Ø ppm Bγ = Ø cpm above Background
		3	6 0		NA	NA	
22				NO RECOVERY			
		9	0	NO RECOVERY	NA	NA	
		13	0	NO RECOVERY	NA	NA	
23	1-4-92 930 100806 RS	Tube ↑		Hard (5Y 5/1) gray, gravelly clay with some sand, high plasticity, moist.	CI		NNU = Ø ppm Bγ = Ø cpm above Background
24	100807	Shelby	28				
25						3.25	
26	RS 100808						

NOTES: R.S.= Rad Screen A/A= As Above

Instrument	Seriel #	Background
HNU Meter	711111	Ø
Pj Meter	85665	40-60
Bγ Meter	N/A	—

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~Bobby Tost~~ BPM John Strapczon

Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1738	COORDINATES: N 483,539 E 1,382,635	DATE 1-4-92
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-4-92
DRILLING METHODS: AUGER		PAGE 8 OF 911

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 (IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
26	1-4-92 1100 100804 RS 100810	15	6	VERY soft (5Y 4/1) Dark gray Clayey Sand (very fine sand) Medium plasticity, moist.	SC ~~SC~~ ~~ML~~	CH 01/22/92 ~~2.25~~ <.25	HNU = Ø ppm Bγ = Ø cpm above Background.
		10	6	A/A	~~ML~~ SC	<.25 ~~2.25~~ CH 01/22/92	
27		12	24 6	A/A	SC ~~ML~~	<.25 ~~2.25~~ CH 01/22/92	
	1-4-92 1100 100808 Medium	7	6	very Soft (5Y 4/1) Dark gray clay w/ Some Sand (very fine) and gravel, medium plasticity moist.	Cl	.5	
28	1-4-92 1130	12	6	A/A	Cl	.5	HNU = Ø ppm Bγ = Ø cpm above Background
	1-4-92 1130 100812 RS 100815	11	6	very soft (5Y 4/1) Dark gray, Clay w Some Sand (very fine) and gravel, medium plasticity moist.	Cl	<.25 ~~2.5~~ CH 01/22/92	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~Bobby Yost~~ STRAPZZON Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	Ø
Bγ Meter	85665	40-60
α Meter	NA	

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: 1738	COORDINATES: N 483,539 E 1,332,635	DATE 1-4-92
ELEVATION: 616.5'	GWL: Depth Date/Time	DATE STARTED: 1-2-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-4-92
DRILLING METHODS: AUGER		PAGE 9 OF 9 11

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 (in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (DPM 1-14-92)
	1-4-92 1130 100813 RS 100816	13	6	very soft (5Y 4/1) Dark gray, Clay w/ some Sand (very fine) and gravel, medium plasticity, moist.	CL	<.25 ~~<.25~~ CJ 01/22/92	HNU = Ø ppm BT = Ø cpm above background
	1-4-92 1130 100817 RS 100817	15	2	A/A	CL	<.25 ~~<.25~~ CJ 01/22/92	
30							

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: ~~Bobby Yost~~ John Strapzzon (DPM) Kevin Meyers

Sample Tech. Vern Larger

Instrument	Seriel #	Background
HNU Meter	711111	Ø
BT Meter	85665	40-60
α Meter	NA	

Samples collected per ASTM Colors identified using Munsell Color Chart

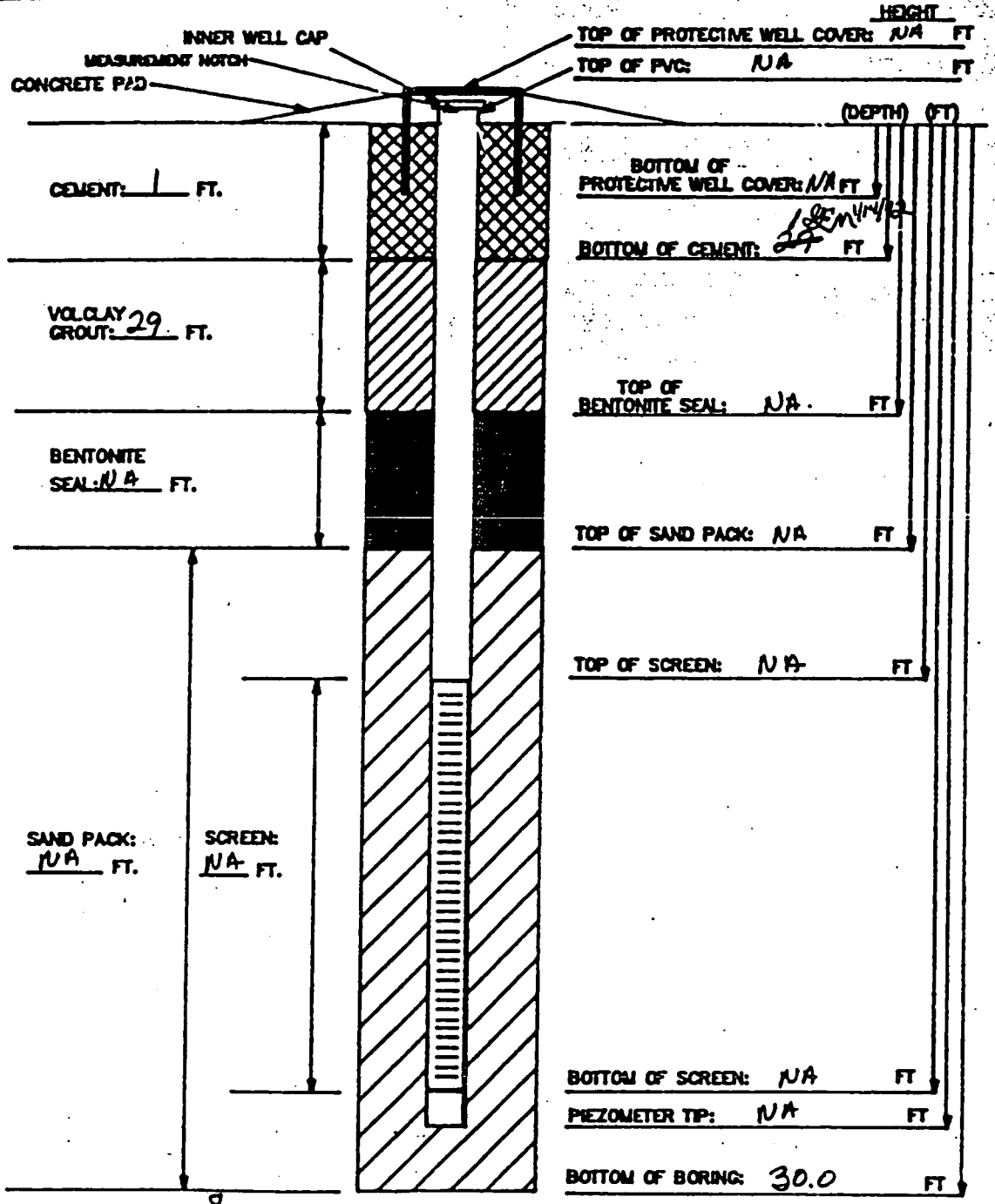
402-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1738

INSTALLATION DATE: 1-4-92

2900



BOREHOLE DIAMETER: 8 INCHES

MATERIALS USED:
SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1
AMOUNT OF CEMENT: 1/2
AMOUNT OF WATER USED: 30 gals
OTHER: NA

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED BUMP.
4) WATER DEPTH/DATE:
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22

GEOLOGIST/ENGINEER: B. Marshall

FERNALD RI/FS

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS (EWMF) FIELD ENG./GEO. JE Marshall DATE 1-14-92
PROJECT NO. 9602.3.22 CHECKED BY DATE
BORING NO. 1738
PIEZOMETER NO. NA DATE OF INSTALLATION NA

BOREHOLE DRILLING

DRILLING METHOD Auger	TYPE OF BIT Auger Bit.
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM — TO —	SIZE NA FROM — TO —
FLUID NA FROM — TO —	SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	NA		NA	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA		NA	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1	BOTTOM 30	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
SAND	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
GRAVEL	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PIEZOMETER TIP	NA		NA	
BOTTOM OF BOREHOLE	30			
GWL AFTER INSTALLATION	NA		NA	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? NA YES ☐ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? NA YES ☐ NO ☐
REMARKS 1.0 foot of cement from 0.0 to 1.0 ft.

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS 2900

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: 1070	COORDINATES:	DATE 1-6-92	
ELEVATION: 598ft	GWL: Depth Date/Time	DATE STARTED: 1-4-92	
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED 1-6-92	
DRILLING METHODS: Cable Tool		PAGE 1 OF 7	

S.A.A - Same As Above

N.R. - No Recovery

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	100602 1030 1-4-92	5	6	med dense, (10yr, 5/4) yellowish brown, silt, some organics, some clay, moist	ML	NA	Hnu - 0 ppm
1	100603 1030 1-4-92	5	6	S.A.A.	ML	NA	Bq - 40 cpm
	100604 1030 1-4-92	12	2	stiff, brownish yellow. (10yr, 6/4) clayey silt, some organics, moist	CL	1.75	α - 0 cpm
2	100605 1035 1-4-92	5	6	S.A.A.	CL	1.75	Hnu - 0 ppm
	100606 1035 1-4-92	6	6	med dense, brownish yellow (10yr, 6/4) clayey silt, trace organics, moist.	ML	NA	Bq - 40 cpm
3	100606 1035 1-4-92	9	3	S.A.A.	ML	NA	α - 0 cpm
	100606 1040 1-4-92	12	6	S.A.A.	ML	NA	Hnu - 0 ppm
4	100606 1040 1-4-92	18	3	S.A.A	ML	NA	Bq - 40 cpm
	100606 1040 1-4-92	22	0	N.R.	NA	NA	α - 0 cpm
5	100606 1045 1-4-92	25	0	N.R.	↓	↓	Hnu - 0 ppm
	1045 1-4-92	26	0	N.R.			Bq - 40 cpm
6	100606 1045 1-4-92	28	0	N.R.	NA	NA	α - 0 cpm
	100606 1050 1-4-92	13	6	Dense, yellowish brown. (10yr, 5/6) clayey silt, trace gravel, moist	ML	NA	Hnu - 0 ppm
7	100606 1050 1-4-92	18	6	Dense, yellowish brown. (10yr, 5/6) silt, some sand, trace clay, moist	ML	NA	Bq - 40 cpm
	100606 1050 1-4-92	27	6	S.A.A.	ML	NA	α - 0 cpm

NOTES

Drilling Contractor - Penn Drilling

Drilling Equipment - Cyclone 43

Driller - Craig Coulter

Asst. - Gary Dye

Backgrounds

Hnu - 0 ppm

Bq - 40 cpm

α - 0 cpm

#100600 - Full HSL, Full Rad

#100607 - Rad Screen (Geotech)

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.22.	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: 1070	COORDINATES:	DATE 1-4-92	
ELEVATION: See p. 1	GWL: Depth Date/Time	DATE STARTED: 1-4-92	
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 1-6-92	
DRILLING METHODS: Cable Tool		PAGE 2 OF 7	

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8	100608 1315 1-4-92	22	6	Dense, brown (10yr, 5/3) poorly graded sand, some silt, V. moist.	SP	NA	Hnu - 0 ppm
	100610 1315 1-4-92	20	6	Dense, brown, (10yr, 5/3) sandy silt, grading to sandy clay, wet to moist.	ml/cl	NA	
chem	100612 1315 1-4-92	23	0	N.R.	NA	NA	Bq - 40 cpm
9	100613 1315 1-4-92	27	0	N.R.	NA	NA	α - 0 cpm
10	100614 1530 1-4-92	Shelby tube remains No blow counts Possible	12	yellowish brown (10yr, 5/4) silty clay, trace gravel, Low to med Plasticity moist. Shelby could not be fully penetrated	CL	NA	Hnu - 0 ppm Bq - 20-40 cpm α - 0 cpm
11	100615 1600 1-4-92	NA	16	Gray, (10yr, 5/1) silty clay, trace gravel, low Plasticity, Sl. moist. -11.8'	CL	NA	Hnu - 0 ppm Bq - 40 cpm α - 0 cpm
12				~~N.R.~~ J.L 1-4-92			
13	100617 0930 1-5-92	30	0	N.R.	NA	NA	Hnu - 0 ppm
14	100618 0930 1-5-92	21	0	N.R.	NA	NA	Bq - 50 cpm
14.5	100619 0930 1-5-92	19	0	N.R.	NA	NA	α - 0 cpm
				cont. Pg 3			

NOTES

#100609 - Rad Screen 7.5-8.0ft Geochem
#100611 - Rad Screen 8.0-8.5ft. Geochem
#100616 - Rad Screen 10.5-13.0 Shelby

402-11-88

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER 602.3.22.	PROJECT NAME. FEMP RI/FS EWMF		
BORING NUMBER: 1070	COORDINATES:	DATE 1-5-92	
ELEVATION See p. 1	GWL: Depth. Date/Time	DATE STARTED: 1-4-92	
ENGINEER/GEOLOGIST. J. Lear	Depth Date/Time	DATE COMPLETED 1-6-92	
DRILLING METHODS: Cable Tool		PAGE 3 OF ~~6~~ 7	

DEPTH (FT)	SAMPLE NO.	BLOWS ON SAMPLER PER 6 (in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15	100620 0935 1-5-92	10	6	V. stiff, gray, (10yr, 5/1) silty clay, some gravel, low plasticity, moist.	CL	2.75	Hnu - 0 ppm
	100621 0935 1-5-92	10	0	N.R.	NA	NA	Bg - 40 cpm
16	100622 0935 1-5-92	16	0	N.R.			
	100623 0935 1-5-92	18	0	N.R.	NA	NA	α - 0 cpm
17	100624 0940 1-5-92	3	6	Stiff, gray, (10yr, 5/1) silty clay, some gravel, low to mid plasticity, V. moist.	CL	1.0	Hnu - 0 ppm
	100625 0940 1-5-92	5	5	S.A.A.	CL	1.0	Bg - 40 cpm
18	100624 0940 1-5-92	9	0	N.R.	NA	NA	α - 0 cpm
	100626 1000 1-5-92	3	6	V. stiff, gray (10yr, 5/1) silty clay, some gravel, low plasticity, moist.	CL	3.0	Hnu - 0 ppm
19	100627 1000 1-5-92	7	0	N.R.	NA	NA	Bg - 40 cpm
	100628 1000 1-5-92	13	0	N.R.	NA	NA	α - 0 cpm
20	100629			Gray, (10yr, 5/1) silty clay some gravel, low plasticity, moist.	CL	NA	Hnu - 0 ppm
	100629	No blow counts	18				
21	100629 1100 1-5-92	on Shelby tube		~~N.R.~~ J.V. 1-5-92			Bg - 40 cpm α - 0 cpm
22				Continued - Pg 4			

NOTES

#100630 - Rad Screen - Shelby 19.5-22.5

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER 602.3.22.	PROJECT NAME FEMP RI/FS EWMF		
BORING NUMBER 1070	COORDINATES:	DATE 1-5-92	
ELEVATION See p. 1	GWL: Depth Date/Time	DATE STARTED 1-4-92	
ENGINEER/GEOLOGIST J. Lear	Depth Date/Time	DATE COMPLETED 1-6-92	
DRILLING METHODS Cable Tool		PAGE 4 OF 7	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	100630 1000 1-5-92	NA	J.L. 1-5-92 ~~10~~	Shelby cont. S.A.A.	CL		
23	100631 1300 1-5-92	4	6	Stiff, gray (10yr, 5/1) silty clay, some gravel low to med plasticity, moist.	CL	2.0	Hnu - 0 ppm
	100632 1300 1-5-92	10	0	NR.	NA	NA	Bd - 40 cpm
24	100633 1300 1-5-92	12	0	NR	NA	NA	α - 0 cpm
	100634 1310 1-5-92	6	6	Stiff, gray, (10yr, 5/1) silty clay, some gravel, low to med plasticity, moist. 24.25	CL	1.5	Hnu - 0 ppm
25	100635 1310 1-5-92	5	0	med dense, gray, (10yr, 5/1) Poorly graded fine sand, some gravel, sl. moist. 24.5	SP	NA	Bd - 50 cpm
	100636 1310 1-5-92	6	0	N.R.	NA		α - 0 cpm
26	100637 0900 1-6-92	5	0	N.R.	NA		Hnu - 0 ppm
	100638 0900 1-6-92	6	0	N.R.	NA		Bd - 50 cpm
27	100639 0900 1-6-92	5	0	N.R.	NA		α - 0 cpm
	100640 0915 1-6-92	6	0	N.R.	NA		Hnu - 0 ppm
28	100641 0915 1-6-92	9	0	N.R	NA		Bd - 40 cpm
	100642 0915 1-6-92	13	0	N.R.	NA		α - 0 ppm
29	100643 1015 1-6-92	7	6	V. dense, gray, (10yr, 5/1) Gravelly clay, some sand, saturated, use of penetrometer not applicable too soupy	CL		Hnu - 0 ppm
	100645 1015 1-6-92	9	5	S.A.A.	CL	NA	Bd - 50 cpm

NOTES

#100644 - Rad Screen, Geochem 28.5 - 29.0'
#100646 - Rad Screen, Geochem 29.0 - 29.5'

402-11-88

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: ~~FEM~~ J.L 602.3.22	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: 1070	COORDINATES:		DATE 1-6-92
ELEVATION: See p. 1	GWL: Depth	Date/Time	DATE STARTED: 1-4-92
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	DATE COMPLETED: 1-6-92
DRILLING METHODS: Cable Tool			PAGE 5 OF 7

DEPTH (FT) 29.5	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30	NA	50/0		Spoon Did not penetrate any further than 29.5	NA	NA	α - 0 cpm
				No water encountered in boring Boring plugged and Abandoned			

NOTES
See Pgs 1-4

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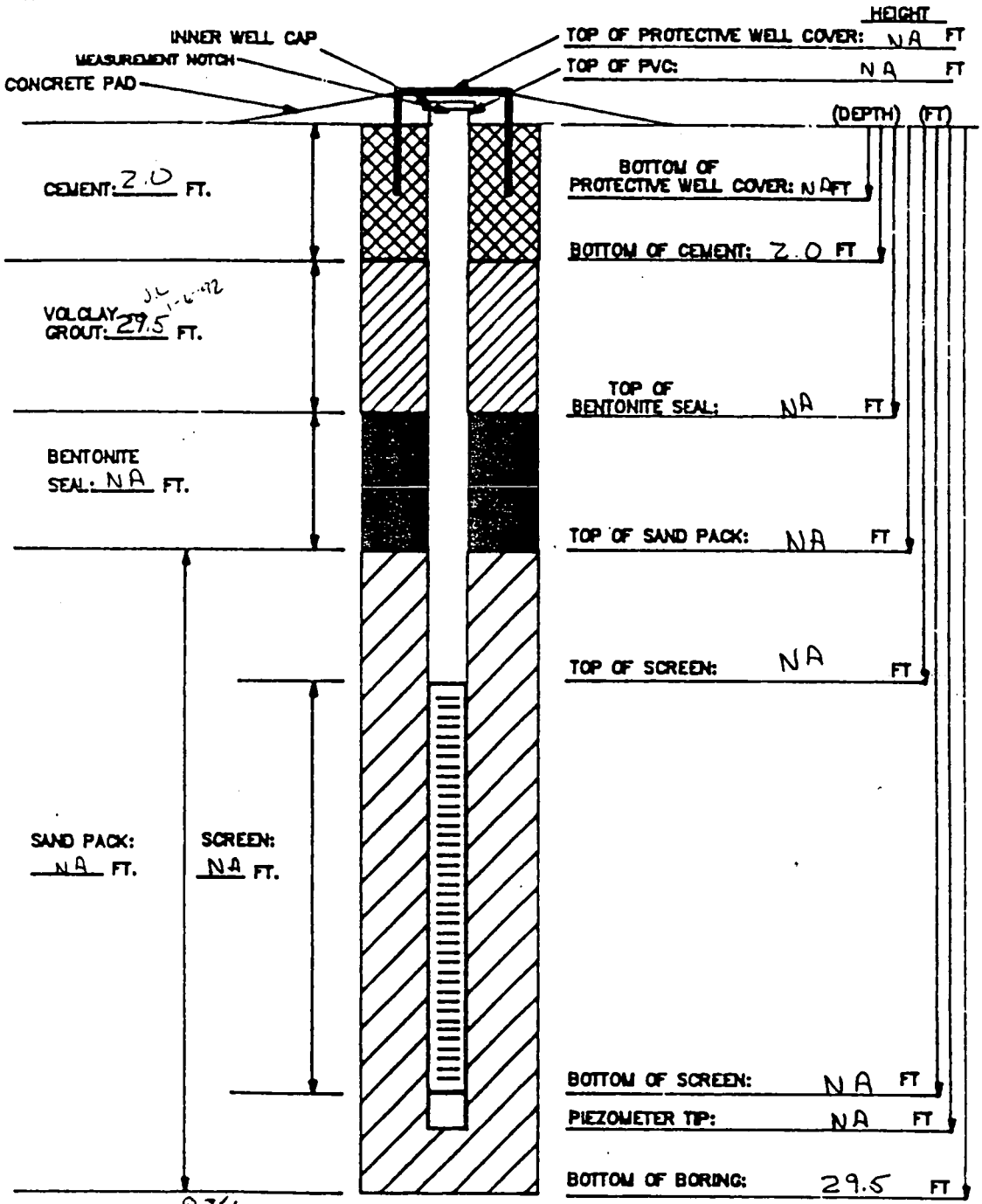
FERNALD RI/FS

INSTALLATION DATE: 1-6-92 2900

INSTALLATION DIAGRAM

J.L 1-6-92 ~~MONITORING WELL~~ Plug/Co boring NO. 1070



MATERIALS USED:

SAND TYPE AND QUANTITY: NA

BENTONITE PELLETS (5-GALLON BUCKETS): NA

BAGS OF VOLCLAY GROUT: 5 50lb bags

AMOUNT OF CEMENT: 1 94lb bag

AMOUNT OF WATER USED: 100 gals

OTHER: NA

NOTES: NA

1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 602.3.22 GEOLOGIST/ENGINEER: J. Lear

FERNALD RI/FS

7/7

PIEZOMETER INSTALLATION SHEET 2900

PROJECT NAME FEMP RI/FS EWMF FIELD ENG./GEO. J. Lear DATE 1-7-92
PROJECT NO. 602.3.22 CHECKED BY _____ DATE _____
BORING NO. 1070
PIEZOMETER NO. NA DATE OF INSTALLATION 1-6-92

BOREHOLE DRILLING

DRILLING METHOD Cable Tool	TYPE OF BIT Cable Tool
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID H_2O FROM 0 TO 29.5	SIZE NA ~~FROM~~ ~~TO~~
FLUID NA ~~FROM~~ ~~TO~~	SIZE 8 in FROM 0 TO 29.5

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (~~ft~~)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
Cement GROUT / SLURRY	TOP 0.0	J.L. 1-7-92 BOTTOM ~~0~~ 2.0		
	TOP 2.0	BOTTOM 29.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	29.5			
GWL AFTER INSTALLATION	NA			

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

REMARKS _____

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FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF) 2800	
BORING NUMBER: ~~1936~~ DEM 1736	COORDINATES: N 483,334 E 1,381,000	DATE 1-5-92
ELEVATION: Est. 605.0'	GWL: Depth Date/Time	DATE STARTED: 1-5-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-5-92
DRILLING METHODS: AUGER		PAGE 1 OF ~~7~~ 4 DEM

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	100820 0845 1-5-92	2	6	FIRM (10YR 5/2) very Dark grayish Brown, silty clay, No plasticity, moist, Some Rootlets.	Cl	.75	TRIP/field Blank Sample # 100821 HNU = Ø ppm βγ = Ø cpm above Background
	100822 0845 1-5-92	2	6	HARD (10YR 3/4) Dark yellowish Brown Silty Clay, Low plasticity, Slightly moist.	Cl	2.25	
1		6	~~18~~ DEM 1-14-92 6	HARD (10YR 3/4) A/A	Cl	2.5	
		8	0	No Recovery	NA	NA	
2	100822 0900 1-5-92	7	6	A/A	Cl	2.5	HNU = Ø ppm βγ = Ø cpm above Background
		7	~~18~~ DEM 1-14-92 6	A/A	Cl	2.5	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Seriel #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	NO METERS IN OFFICE	

402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: ~~1936~~ 1736	COORDINATES: N 483,334 E 1,381,000	DATE 1-5-92
ELEVATION: Est. 605.0'	GWL: Depth Date/Time	DATE STARTED: 1-5-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-5-92
DRILLING METHODS: AUGER		PAGE 2 OF ~~2~~ 3

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	900 100822 1-5-92	10	6	Soft (10YR 5/4) yellowish Brown silty clay, with some gravel & sand, Low Plasticity, slightly moist	Cl	.5	HNU = ∅ ppm Bγ = ∅ cpm above Background
		12	0	NO RECOVERY	NA	NA	
4	100823 930 RS 100827	15	6	Soft (10YR 5/4) yellowish Brown silty clay, Low plasticity, slightly moist.	Cl	.5	HNU = ∅ ppm Bγ = ∅ cpm above Background
	100824 RS 100828	15	6	A/A (HARD)	Cl	2.0	
5	100825 RS 100829	13	6	Firm (10YR 5/4) yellowish Brown, Sandy Clay, Low plasticity, slightly moist.	Cl	1.0	
	100826 RS 100830	16	3	VERY HARD (10YR 5/4) yellowish Brown Silty Clay with Traces of Sand and gravel, Low Plasticity, Slightly moist.	Cl	>4.5 ~~>4.5~~ 1/22/97	

NOTES:

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Meyers

Sample Tech. Vern Larger

R.S.= Rad Screen A/A= As Above

Instrument	Seriel #	Background
HNU Meter	711111	6
Bγ Meter	85665	40-60
α Meter	NO METERS IN OFFICE	

Samples collected per ASTM Colors identified using Munsell Color Chart

402-11-86

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: ~~1936~~ 1736	COORDINATES: N 483,334 E 1,381,000	DATE 1-5-92
ELEVATION: Est. 605.0'	GWL: Depth Date/Time	DATE STARTED: 1-5-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-5-92
DRILLING METHODS: AUGER		PAGE 3 OF ~~4~~ 5

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6"	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
6	100831 1000 100832	17	6	VERY Soft (10YR 4/4) Dark yellowish Brown, Clayey Sand, No plasticity (sand very fine). wet.	ML	<.25 ~~.25~~ @04/22/92	HNU = Ø PPM
				VERY HARD (10YR 5/4) yellowish Brown silty clay with Traces of Sand & gravel, Low Plasticity, Slightly moist.	CI	@04/22/92 ~~>4.5~~ >4.5	βγ = Ø cpm above Background
	1000 100832 1-5-92	23	6	A/A		@04/22/92 ~~>4.5~~ >4.5	
7	1000 100833 1-5-92	30	~~24~~ 1-14-92 6	HARD (10YR 5/4) yellowish Brown, Sandy clay, with Traces of gravel, No Plasticity, moist	CI	2.75	
	1000 100834 1-5-92	33	6	VERY HARD (10YR 5/4) yellowish Brown silty clay with Traces of Sand & gravel Low Plasticity, Slightly moist.	CI	@04/22/92 ~~>4.5~~	END of weathering ZONE.
				VERY HARD (5Y 5/1) gray, Silty clay, with Traces of gravel. No Plasticity, DRY.	CI	>4.5	
8	1000 1-5-92 100835	Kelly tube	6 ~~18~~	VERY HARD (5Y 5/1) gray, silty clay with Some gravel, No Plasticity DRY	CI	>4.5 @04/22/92 ~~>4.5~~	HNU = Ø PPM βγ = Ø CPM above Background
9	~~RG 100830 & 100837 (Bottom)~~ RGM 1-5-92						Hit Cobble at END of Tube. Remove sample from tube. ARCHIVE IN 500ml JAR.
							AUGER DOWN TO 10 feet To By pass Limestone Cobble.
10				NO Sample taken			
10.5	100836 1115 1-5-92	11	6	VERY HARD (5Y 5/1) gray, silty clay with some gravel, NO Plasticity, DRY	CI	>4.5 ~~>4.5~~ @04/22/92	HNU = Ø PPM βγ = Ø CPM above Background

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon
Kevin Meyers

Sample Tech. Vern Larger

Instrument	Serial #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	NO METER IN OFFICE	

Samples collected per ASTM Colors identified using Munsell Color Chart

 402-11-86

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: ~~1936~~ 1736	COORDINATES: N 483,334 E 1,381,000	DATE 1-5-92
ELEVATION: Est. 605.0'	GWL: Depth Date/Time	DATE STARTED: 1-5-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-5-92
DRILLING METHODS: AUGER		PAGE 4 OF 7

DER 1-14-92

DEPTH 14.1 10.5	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1115 1-5-92	15	6	(5y 4/1) Dark gray Limestone Cobbles	NA	NA	HNU = ∅ ppm βγ = ∅ cpm above Background
11	1115 1-5-92 100837	21	~~24~~ 1-14-92 6	Medium Dense ~~Very Soft~~ (5y 5/1) gray, clayey gravelly Sand, wet.	GC	NA ~~3.5~~ 01-22-92	
		24	0	No Recovery	NA	NA	
12	100837 1330 1-5-92	9	6	Loose (5y 5/1) gray, clayey gravelly sand, wet	GC	NA	HNU = ∅ ppm βγ = ∅ cpm above Back ground
	100837 1330 1-5-92	13	~~24~~ 1-14-92 6	Medium Dense (5y 5/1) gray, clayey gravelly sand, wet	GC	NA	
13	100838 1330 1-5-92	14	6	Hard (5y 4/1) Dark gray silty clay with some gravel, No plasticity, Slightly moist	CI	3.5	

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon

Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

Instrument	Serial #	Background
HNU Meter	711111	∅
βγ Meter	85665	40-60
α Meter	no meters in office	

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602.3.22	PROJECT NAME. FERNALD RI/FS (EWMF)	
BORING NUMBER: ~~1936~~ BEM 1736	COORDINATES: N 483,334 E 1,381,000	DATE 1-5-92
ELEVATION: Est. 605.0'	GWL: Depth Date/Time	DATE STARTED: 1-5-92
ENGINEER/GEOLOGIST. G.E.Marshall	Depth Date/Time	DATE COMPLETED: 1-5-92
DRILLING METHODS: AUGER		PAGE 5 OF ~~5~~ 7

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (PGA 1-14-92)
	100838 1330 1-5-92	17	6	VERY HARD (5Y 4/1) Dark gray, Silty Clay w/some gravel, No Plasticity Slightly moist.	CL	4.5	
14	100839 1408 Full Red	14	6	MEDIUM DENSE (5Y 5/1) gray, clayey gravelly Sand, wet	GC	NA	HNU = Ø ppm βγ = Ø cpm above Background
		19	6	A/A	GC	NA	Stop boring; perched water encountered ~~Stop boring at 14ft~~ Perched water 11ft ~~Encountered at 14ft~~
15	100840 1408 1-5-92	25	6	HARD (5Y 4/1) Dary gray, ~~Cta Sam~~ Silty Clay with some gravel, No plasticity, Slightly moist.	CL	3.5	
		17	0	NO RECOVERY	NA	NA	
16				Bottom of sampling 16.0 FT			Plug Hole used 1 1/2 of Vol clay grout & 30 gals of water.

NOTES: R.S.= Rad Screen A/A= As Above

Drilling Contractor PENN DRILLING

Drilling Equipment MOBIL DRILLING RIG 80

Driller: John Strapzzon
Kevin Meyers

Sample Tech. Vern Larger

Samples collected per ASTM Colors identified using Munsell Color Chart

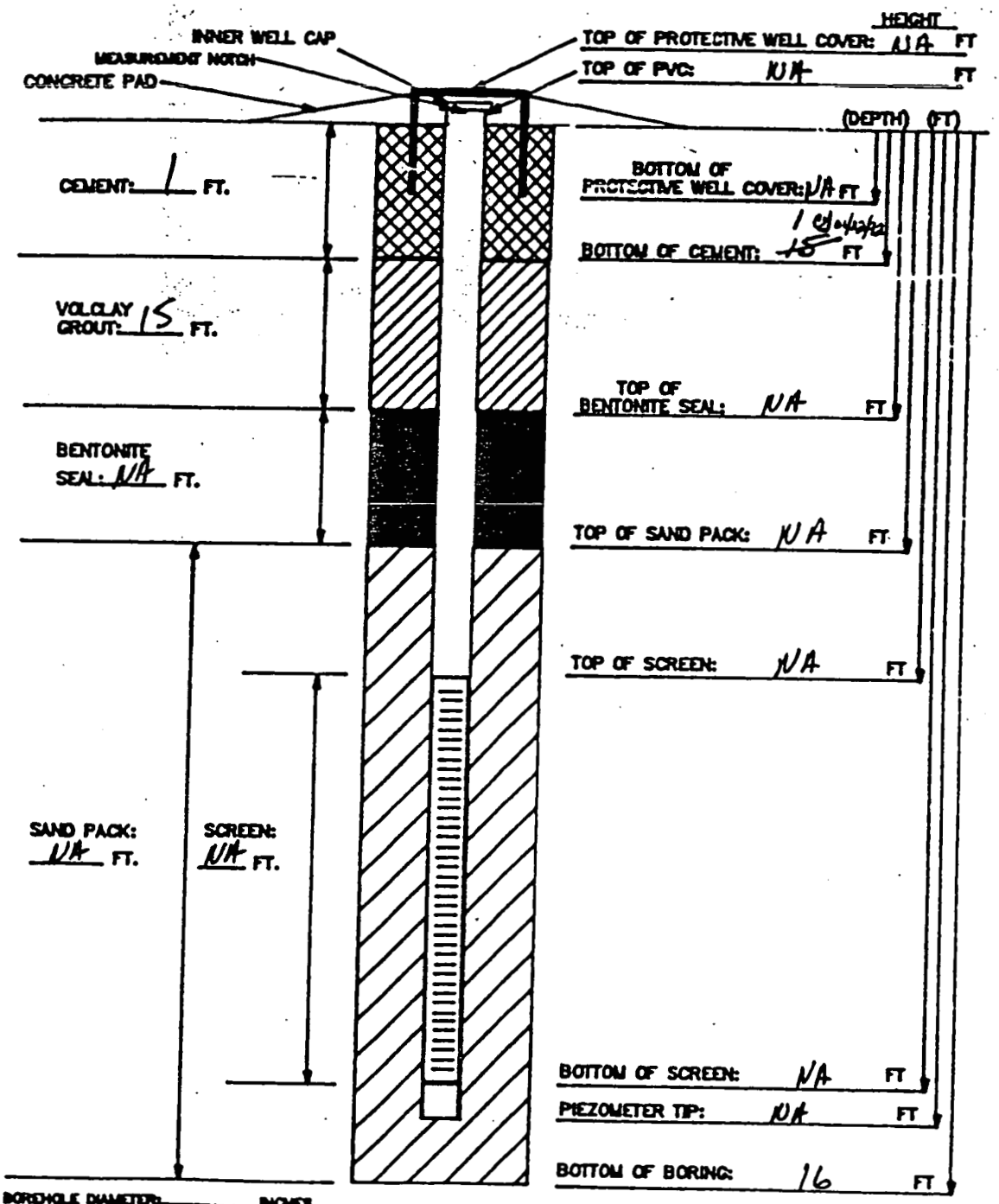
Instrument	Seriel #	Background
HNU Meter	711111	Ø
βγ Meter	85665	40-60
α Meter	No METER	IN OFFICE

402-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1736

INSTALLATION DATE: 1-5-92 2900



BOREHOLE DIAMETER: _____ INCHES

MATERIALS USED:
SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1 1/2 Bag
AMOUNT OF CEMENT: 1/2 Bag
AMOUNT OF WATER USED: 30 gals
OTHER: NA

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22 GEOLOGIST/ENGINEER: GE Marshall

FERNALD RI/FS

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS (EWMF) FIELD ENG./GEO. JE Marshall DATE 1-14-92
PROJECT NO. 9602.3.22 CHECKED BY C. Ulrich DATE 01/23/92
BORING NO. 1736
PIEZOMETER NO. NA DATE OF INSTALLATION NA

BOREHOLE DRILLING

DRILLING METHOD Auger	TYPE OF BIT Auger Bit.
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM — TO —	SIZE NA FROM — TO —
FLUID NA FROM — TO —	SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft.)	
TOP OF RISER PIPE	NA		NA	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA		NA	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1	BOTTOM 16	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
SAND	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
GRAVEL	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP NA	BOTTOM NA
PIEZOMETER TIP	NA		NA	
BOTTOM OF BOREHOLE	16			
GWL AFTER INSTALLATION	NA		NA	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? NA YES ☐ NO ☐
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? NA YES ☐ NO ☐
REMARKS 1' of cement from 0.0 to 1.0

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOIL

2900

PROJECT NUMBER: 602.3.22	PROJECT NAME: Femp RI/FS		
BORING NUMBER: 1679	COORDINATES:		DATE 1-23-92
ELEVATION:	GWL: Depth Dry	Date/Time 1-28-92, 0945	DATE STARTED: 1-23-92
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	DATE COMPLETED 1-27-92
DRILLING METHODS: Cable tool			PAGE 1 OF 7

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	100400 100401 1530 1-23-92	3 7 8	7	Stiff, dark brown, (10yr. 3/3) silty clay, some organics, moist, low plasticity	CL	1.25	Hnu - 0 ppm Bg - 40 cpm
2 3	100400 1535 1-23-92	7 8 10	12	Stiff yellowish brown, (10yr. 5/8) silty clay, some gravel, med. plasticity, v. moist.	CL	1.25	Hnu - 0 - ppm Bg - 40 cpm
4	100400 1540 1-23-92	8 10 10	12	S.A.A.	CL	1.5	Hnu - 0 ppm Bg - 40 cpm
5 6	100402 1600 1-23-92	Shelby Attempt Recovery Not Ample to use	16 Shelby	yellowish brown, (10yr. 5/8) clay silt sand gravel, mix, ↓ 5.75	GC	NA	Hnu - 0 ppm Bg - 40 cpm
7	1600	for Sample Recovery is Archived	Pushed 2.7ft	N R ↑ ↓ J.L. N.R	NA	NA	Hnu - 0 ppm Bg - 50 cpm

NOTES

Drilling Contractor - Penn Drilling
Drilling Equipment - Cyclone 43
Driller - Craig Coulter
Asst. - Gary Dye

S.A.A - Same As Above
N.R. - No Recovery

Background
Hnu - 0 ppm
Bg - 50 cpm

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1679	COORDINATES:	DATE 1-23-92
ELEVATION:	GWL: Depth see p91 Date/Time	DATE STARTED: 1-23-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 1-27-92
DRILLING METHODS: Cable tool		PAGE 2 OF 7

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8	100403 100404 100405 100406 1625	9 10	12	S.A.A ~~S.A.A~~ S.A.A	GC GC	NA NA	Hnu - 0 ppm Bt - 50 cpm
9	1-23-92	10		N.R.			
10	100407 1630 1-23-92	12 13 21	8	V. stiff, brown to gray, (10yr. 5/3) to (10yr. 5/1) silty clay, trace gravel, moist. Low plasticity.	CL	3.5	Hnu - 0 ppm Bt - 50 cpm
11	100407 1635 1-23-92	10 12 18	6	Hard, lgray. (10yr. 5/1) silty clay, trace gravel, sl. moist. Low plasticity	CL	4.0	Hnu - 0 ppm Bt - 50 cpm
12 13	100407 1640 1-27-92	12 16 25	8	V. Stiff, gray to brown, (10yr. 5/1) to (10yr. 5/3) silty clay, some gravel, moist.	CL	3.5	Hnu - 0 ppm Bt - 50 cpm
14 15	100407 0400 1-24-92	12 15 19	0	N.R	NA	NA	Hnu Bt } NA

NOTES: See Page 1

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER 602.3.22	PROJECT NAME. FEMP RI/FS	
BORING NUMBER: 602.3.22	COORDINATES:	DATE 1-24-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-23-92
ENGINEER/GEOLOGIST J. Lear	Depth Date/Time	DATE COMPLETED 1-27-92
DRILLING METHODS cable tool		PAGE 3 OF 7

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	See Above 1-24-92	21	0	N.R.	NA	NA	See Above
16	100408 100409	5	6	Stiff, gray, (10yr, 5/1) silty clay, some gravel, low to mid plasticity, moist to very moist.	CL	3.5	Hnu - 0 ppm
	100410 100411	3 3	3	S.A.A	CL	2.5	
	0905						
17		50/3	0	NR	NA	NA	Bd - 50 cpm
	1-24-92	NR	0	J.L. 1-24-92 Stiff NP	NA	NA	
18	100412	9	2	Stiff, gray to grayish brown, (10yr, 5/1) to (2.5y, 5/2) silty gravelly clay, low to mid plast. moist. to v. moist.	CL	J.L. 1-24-92 2.0	Hnu - 0 ppm
	0910	10					Bd - 40 cpm
19	1-24-92	11					
	100413	4	9	Stiff, grayish brown, (2.5y, 5/2) silty clay, some gravel, low to mid plast. moist.	CL	1.5	Hnu - 0 ppm
20	0915	7					Bd - 40 cpm
	1-24-92	10					
21	100414 100415	5	8	S. A. A.	CL	1.5	Hnu - 0 ppm
	0930	7					Bd - 50 cpm
22	1-24-92	16					
				cont. page 4			

NOTES

See page 1

FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1679	COORDINATES:	DATE 1-24-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-23-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 1-27-92
DRILLING METHODS: Cable Tool		PAGE ~~3~~ 4 OF 7

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 (in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
22	100414	5		Stiff, gray, (10yr, 5/1) silty clay, some gravel, low plasticity, sl. moist. 22.4'	CL	1.5	Hnu - 0 ppm
23	0940	12	8	med dense, sandy, clayey, well graded gravel, sl. moist.	GC	NA	
	1-24-92	16					Bd - 40 cpm
24	1015	8	0	N.R.	NA	NA	Hnu - 0 ppm
25	1-24-92	12					Bd - 40 cpm
		20					
	1070	10	0	N.R.	NA	NA	Hnu - NA
	1-24-92	15					Bd - NA
		19					
27	1040	8	0	N.R.	NA	NA	Hnu - NA
28	1-29-92	12					Bd - NA
		12					
	100416	2		med stiff, dark grayish brown, (2.5y, 4/2) silty clay, some sand, some gravel, med plasticity, moist.			
29	1050	8	15		CL	.75	Hnu - 0 ppm
	1-24-92	12					Bd - 40 cpm

NOTES See page 1

FERNALD RI/FS

VISUAL CLASSIFICATION OF SOIL

2900

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: 1679	COORDINATES:		DATE 1-24-92
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 1-23-92.
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	DATE COMPLETED J.L. 1-24-92 1-27-92
DRILLING METHODS: Cable tool			PAGE 5 OF 7

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30	100417 100418 10419	No blows on shelby tube	Pushed 30 ft Recovery 34 in	Stiff, olive brown, (2.5Y, 4/3) silty clay, some gravel, trace sand, med plasticity, moist	CL	1.5	Hnu - 0 ppm
31	1100						
32	1-24-92						Bd - 40cpm
33	~~100419~~ ~~100420~~ J.L. 1-24-92 100420 100421 1110	5 6 10 15	5 0 0 0	med stiff, olive brown (2.5Y, 4/3) sandy silty clay, low to med plast. moist to v. moist. NR. NR. N.R	CL	.75	Hnu - 0 ppm
34	1-24-92						Bd - 40cpm
35				Sampling ends a 34.5 ft J.L 1-24-92 Drilling Ends at 35.0 ft.			

NOTES See page 1
100422 - Full HSL
100423 - Trip Blank
100424 - Total U Wenco
100425 - Total U Th. II

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		DATE: 1/2/92
BORING NUMBER: 1739	COORDINATES:		DATE STARTED: 1/2/92
ELEVATION: 617 ft	GWL: Depth	Date/Time	DATE COMPLETED: 1/4/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	PAGE 1 OF 10
DRILLING METHODS: Hollow Stem Auger			

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		2	0	No Recovery.	NA	NA	0-1½" hand auger sample 101334 (0930) 101335
		6	0	No Recovery	NA	NA	
1		7	0	No Recovery	NA	NA	
	101336 (0945) 1/2/92	10	6	Very stiff. 10YR (5/4) yellowish brown. Silty clay with sand & gravel. Low plasticity moist.	CL	2.25	
2		7	0	No Recovery	NA	NA	HNU = 0 ppm BD = 0 cpm
		9	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner, Don Jamison

Background
HNU = 0 ppm
BD = 30 cpm
Background subtracted out.

407-11-86

FE RNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EW MF		
BORING NUMBER: 1739	COORDINATES:	DATE 1/2/92	
ELEVATION: 617 ft	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 2 OF 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101337 (0945) 1/2/92	18	6	Very stiff 10YR (3/4) yellowish brown mottled w/ gray. Silty clay some gravel. Low plasticity Moist slightly	CL	2.5	
		25	6	SAA	CL	2.75	
4		3	0	No Recovery	NA	NA	Rock was found in bottom of spoon.
		4	0	No Recovery	NA	NA	
5		7	0	No Recovery	NA	NA	
		9	0	No Recovery	NA	NA	

NOTES:
Drilling Contractor Pennsylvania Drilling
Drilling Equipment Bombardier Mobile Drill
Driller: Elay Gardner
Dan Jamison

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EU MF		
BORING NUMBER: 1739	COORDINATES:	DATE: 1/2/92	
ELEVATION: 617 ft	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 3 OF 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		6	6	Very stiff. 10YR(5/4) Yellowish brown. Silty clay, w/gravel. Some plasticity, MOIST	CL	2.5	HNU = 0ppm RD = 0cpm
101	101333 (1015) 1/2/92	8	6	Stiff. 5Y(5/1) Very dark gray. Clay. Medium plasticity, MOIST	CL	1.5	
7		10	6	SAA, very stiff.	CL	2.5	
		13	6	Stiff. 5Y(5/1) Gray. Clay with gravel. Low plasticity, MOIST	CL	2.0	
8 RAD	101339 101340 (1030) 1/2/92	8	6	SAA	CL	2.0	HNU = 0ppm RD = 0cpm
RAD	101341 101342 1030 1/2/92	10	6	SAA	CL	2.0	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Clay Gardner
Don Jamison

SAA = Same As Above

407-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF		
BORING NUMBER: 1739	COORDINATES:	DATE: 1/2/92	
ELEVATION: 617 ft	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 4 OF 9	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
RAD	101512 101644 11000 1/2/92	11	6	Stiff. 5Y (5/1) Gray clay with gravel. Low plasticity moist	CL	2.5	
		13	0	No Recovery	~~CL~~ NA	~~1.5~~ NA	
10			0	No Recovery	NA	NA	Augured down to 12' after crushing shelby
			0	No Recovery	NA	NA	
11			0	No Recovery	NA	NA	
			0	No Recovery	NA	NA	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Clay Gardner
Dan Jamison

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FERNALD RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1739	COORDINATES:	DATE: 1/4/92	
ELEVATION: 617 ft.	GWL: Depth / Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth / Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 5 OF 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
			0	No Recovery			Pushed Shelby at 12', crushed the tube at 13'
			0	No Recovery			
13	10135 (1330) 9134 1/4/92	17	6	Very stiff. 5Y (5/1) Gray mottled w/ yellowish brown. Gravelly clay, 1/2" zone of sand. Low plasticity wet	CL	2.5	HNU=0ppm BG=0cpm
		13	2	Very stiff. SAA	CL	2.25	
14		15	0	No Recovery	NA	NA	
		20	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombacher Mobile Drill

Driller: Elay Gardner, Don Jamison

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FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF		
BORING NUMBER: 1739	COORDINATES:	DATE 1/4/92	
ELEVATION: 617 ft.	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 6 OF 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	10,346 (1355) 1/4/92	4	6	Stiff. 5Y (5/1) Gray. mottled w/ yellowish brown. Gravelly clay. Low plasticity wet	CI	1.5	HNU=0ppm BZ=0ppm
		4	6	Very Stiff. SAA	CI	2.0	
16		8	6	SAA	CI	2.75	
		10	4	SAA	CI	3.25	
17	10,348 (1410) 1/4/92	17	6	SAA	CI	3.0	HNU=0ppm BZ=0ppm
		18	6	SAA	CI	3.25	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Elay Gardner
Dan Jamison

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402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF		
BORING NUMBER: 1739	COORDINATES:	DATE: 1/4/92	
ELEVATION: 617 ft.	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 7 OF 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		20	4	Very stiff. 5Y (5/1) Gray mottled with yellowish brown Gravelly clay. Low plasticity wet	CL	3.75	
		25	0	No Recovery	NA	NA	
19	10:34 HS 10:35 AD (HED) 1/4/92		34"	Very stiff. 5Y (5/1) Gray gravelly clay. Low plasticity, very moist.	Cl	2.5	HNU = 0ppm BX = 0cpm Shelby tube pushed from 19.0 ft to 22.0 ft.
		Tube					
20		Shelby					

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Elay Gardner

Don Jamison

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402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EW MF		
BORING NUMBER: 1739	COORDINATES:	DATE 1/4/92	
ELEVATION: 617 ft	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 8 OF 13	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		Tubed					
	Rad 101350 (1400) 1/4/92	Shelby					
22	101351 (1300) 1/4/92	7	6	Stiff. 5Y (5/1) Gray. gravelly clay. Low plasticity moist.	Cl	1.25	HNU=0ppm BX=0cpm
		11	6	SAA	Cl	1.25	
23		12	0	No Recovery	NA	NA	
		14	0	No Recovery	NA	NA	

NOTES:
Drilling Contractor Pennsylvania Drilling
Drilling Equipment Bombadier Mobile Drill
Elay Gardner
Dan Jamison

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FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF		
BORING NUMBER: 1739	COORDINATES:	DATE: 1/4/92	
ELEVATION: 1117 ft.	GWL: Depth Date/Time	DATE STARTED: 1/2/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/4/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 9 OF 10	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		7	0	No Recovery	NA	NA	Rock in base of spoon
		9	0	No Recovery	NA	NA	
25		14	0	No Recovery	NA	NA	
		24	0	No Recovery	NA	NA	
26		4	0	No Recovery	NA	NA	Rock jammed in spoon
		11	0	No Recovery	NA	NA	

NOTES:
Drilling Contractor Pennsylvania Drilling
Drilling Equipment Bombardier Mobile Drill
Driller: Elgy Gardner
Doth Jamison

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402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF	DATE 1/4/92
BORING NUMBER: 1739	COORDINATES:	DATE STARTED: 1/2/92
ELEVATION: 617 ft	GWL: Depth Date/Time	DATE COMPLETED: 1/4/92
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	PAGE 10 OF 10
DRILLING METHODS: Hollow Stem Auger		

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		12	0	No Recovery	NA	NA	
		11	0	No Recovery	NA	NA	
25	101352 101353 (1545) 1/4/92	10	6	Stiff. 5Y (5/1) Gray gravelly clay. Low plasticity. moist.	cl	1.25	HNU=0ppm RX=0cpm
	101354 101355 (1545) 1/4/92	72	6	SAA	cl	1.5	
29	101356 101357 (1545) 1/4/92	26	6	SAA	cl	1.25	
		30	0	No Recovery	NA	NA	
	30						

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Eloy Gardner
Don Sumison

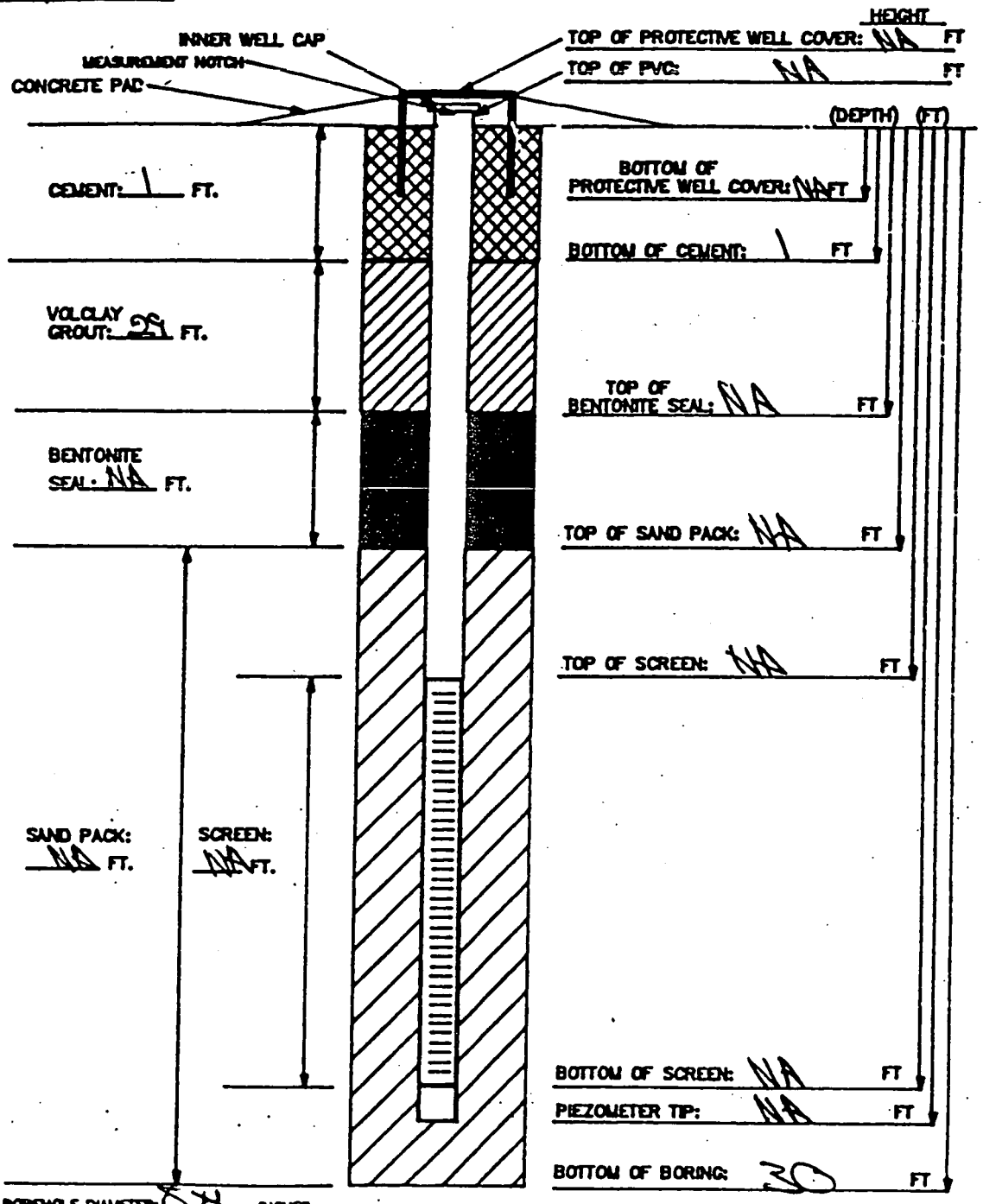
402-11-86

11 of 12 2900

FERNALD RI/FS 3.22

INSTALLATION DATE: 1/5/92

INSTALLATION DIAGRAM
MONITORING WELL NO.
1739



BOREHOLE DIAMETER: 8 1/4 INCHES
1/5/92

MATERIALS USED:
SAND TYPE AND QUANTITY:
BENTONITE PELLETS (5-GALLON BUCKETS):
BAGS OF VOLCLAY GROUT: 2 bag
AMOUNT OF CEMENT: 1 bag
AMOUNT OF WATER USED:
OTHER: N/A

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: N/A
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

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TASK: 3.22 GEOLOGIST/ENGINEER: D. O'Brien

FERNALD
RI/FS

12012

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS EWMF FIELD ENG./GEO. D. O'Brien DATE 1/15/92
PROJECT NO. 9602-3.22 CHECKED BY C. Gruber DATE 01/17/92
BORING NO. 1739
PIEZOMETER NO. NA DATE OF INSTALLATION

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Augers
DRILLING FLUID (S) USED:
FLUID NA FROM NA TO NA
FLUID NA FROM NA TO NA

TYPE OF BIT NA
CASING SIZE (S) USED:
SIZE NA FROM NA TO NA
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE:
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1.0	BOTTOM 30.0	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	30			
GWL AFTER INSTALLATION	NA			

THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒ 208

REMARKS 0.0-1.0 ft. cement cap

409-11-86

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: 2400	COORDINATES:	DATE 12-12-91	
ELEVATION:	GWL: Depth 63.4 Date/Time 12-21-91/1230	DATE STARTED: 12-12-91	
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91	
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 1 OF 8/10	

K.M. 1-16-92

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0 .9 1.5	12-12-91 1410 53625	3 5 5	11	Stiff yellowish brown (10 YR, 5/4) CLAYEY SILT with organic matter, moist	ML	1.5	Hnu = .2 ppm Bγ = 60 cpm α = 0 cpm
2.3 3.0	12-12-91 1415 53626	5 13 15	10	Hard yellowish brown (10YR, 5/4) SILTY CLAY with sand and some black weathering, a little organic matter, damp, non plastic	CL	>4.5	Hnu = .2 ppm Bγ = 60 cpm α = 0 cpm
3.5 4.5	12-12-91 1420 53627	15 16 20	6	Hard light yellowish brown (2.5Y, 6/4) SILTY CLAY with sand and a little fine gravel, dry, non plastic	CL	>4.5	Hnu = .2 ppm Bγ = 60 cpm α = 0 cpm
5.3 6.0	12-12-91 1430 53628	18 18 18	10	Hard light yellowish brown (2.5Y, 6/4) SILTY CLAY with sand and trace fine gravel, damp, non plastic	CL	4.5	Hnu = .2 ppm Bγ = 60 cpm α = 0 cpm
6.8 7.5	12-12-91 1435 53629	17 17 16	10	Hard light yellowish brown (2.5Y, 6/4) SILTY CLAY with sand and a little gravel, damp, non plastic	CL	4.5	Hnu = .2 ppm Bγ = 60 cpm α = 0 cpm

NOTES:
Drilling Company: Pennsylvania Drilling
Driller: Dave Newman
Assistant Driller: Bob Johnson

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

Hnu = A01343	.2 ppm	Background Levels
Bγ S/N: 73937	60 cpm	
α S/N: 73908	0 cpm	

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2400	COORDINATES:	DATE 12-12-91
ELEVATION:	GWL: Depth 63.4 Date/Time 12-21-91/1230	DATE STARTED: 12-12-91
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
DRILLING METHODS: CABLE Tool 10" drill bit		PAGE 2 OF 8/10

K.M. 1-16-92

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
7.5	12-12-91 1440 53630	13 12 21	0	No Recovery	N/A	N/A	Hnu= Br= α= N/A
9.0 9.5	12-12-91 1450 53631	13 21 30	6	Stiff light yellowish brown (2.5Y, 6/4) CLAY with some sand and fine gravel, moist, medium plasticity	CL	1.5	Hnu= .2 ppm Br= 60 cpm α= 0 cpm
10.5 11	12-16-91 1314 53632	8 12 18	6	Stiff light yellowish brown (2.5Y, 6/4) SANDY CLAY with gravel, moist medium plasticity	CL	1.5	Hnu= .2ppm Br= 40 cpm α= 0 cpm
12	12-16-91 1325 53633	12 28 31	18	Very stiff gray (2.5Y, 5/0) SANDY CLAY with gravel, damp, low plasticity	CL	3.0	Hnu= .2 ppm Br= 40 cpm α= 0 cpm
13.5 13.75	12-16-91 1345 53634	7 9 12	3	Same as above	CL	3.0	Hnu= .2 ppm Br= 40 cpm α= 0 cpm
15							

NOTES

on 12-16-91 Gary Dye was the Assistant Driller

12-16-91

Hnu S/N: A01343	.2 ppm	Background Levels
Br S/N: 73937	40 cpm	
α S/N: 73908	0 cpm	

402-11-88

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2400	COORDINATES:	DATE 12-16-91
ELEVATION:	GWL: Depth 63.4 Date/Time 12-21-91/1230	DATE STARTED: 12-12-91
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
DRILLING METHODS: CABLE Tool 10" Drill Bit.		PAGE 3 OF 8/10

K.M. 1-16-92

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 (in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15	12-16-91 1400 53635	3 5 8	12	Very stiff gray (5Y, 5/1) SANDY CLAY with gravel, damp, low plasticity	CL	3.0	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
16.5	12-16-91 1410 53636	3 4 8	6	Same as above	CL	3.0	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
18	12-16-91 1430 53637	3 8 10	12	Very stiff gray (5Y, 5/1) SANDY CLAY with gravel, damp, medium plasticity	CL	2.0	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
19.5	12-16-91 1540 53638	3 6 9	0	No Recovery	N/A	N/A	N/A
21	12-16-91 1645 53639	5 9 9	12	Very stiff gray (5Y, 5/1) SANDY CLAY with gravel, damp, medium plasticity	CL	2.5	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
22.5							

NOTES

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

ECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	KMo 12-16-91
ORING NUMBER: 2400	COORDINATES:	DATE 12-16-91
LEVATION:	GWL: Depth 63.4 Date/Time 12-21-91 1230	DATE STARTED: 12-12-91
NGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
RILLING METHODS: Cable Tool 10" drill bit		PAGE 4 OF ~~8~~ 10

K.M. 1-16-92

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
22.5	12-16-91 1655 53640	2 4 5	14	Loose olive brown (2.5Y, 4/3) medium SAND with trace gravel, dry	SP	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
23.7 24	12-16-91 0900 53641	4 6 12	12	Medium dense grayish brown (2.5Y, 5/2) medium SAND with trace gravel, dry	SP	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
25				Samples will be taken at 5 ft. intervals			
30							

NOTES

12-17-91

Hnu S/N: 711111 .2 ppm
Bγ S/N: 73937 40 cpm
α S/N: 73908 0 cpm
} Background Levels

212

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2400	COORDINATES:	DATE 12-17-91
ELEVATION:	GWL: Depth 63.4 Date/Time 12-21-91/1230	DATE STARTED: 12-12-91
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 5 OF 8/10

K.M. 1-16-92

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30	12-17-91 0945 53642	39 45 49	14	Very dense light yellowish brown (2.5Y, 6/3) gravelly SAND, dry	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
31.5							
35	12-17-91 1015 53643	19 18 23	18	Same as above but dense	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
36.5							
40	12-17-91 1120 53644	10 17 20	15	Same as above	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
41.5							
45							

NOTES

402-11-66

ERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

CT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
RING NUMBER: 2400	COORDINATES:	DATE 12-17-91
EVATION:	GWL: Depth 63.4 Date/Time 12-21-91 1230	DATE STARTED: 12-12-91
GINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
ILLING METHODS: Cable Tool 10" drill bit		PAGE 6 OF ~~8~~ 10

K.M. 1-6-92

ft.	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
5 6.5	12-17-91 1430 53645	17 49 50	18	Same as above but very dense	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
0							
	12-17-91 1520 53646	6 15 27	14	Same as above but dense	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
5							
6 .5	12-17-91 1600 53647	39 50	12	Very dense light yellowish brown (2.5Y, 6/3) Sandy Gravel dry	GW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
0							

OTES:

214

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3-23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2400	COORDINATES:	DATE 12-18-91
ELEVATION:	GWL: Depth 63.4 Date/Time 12-21-91 1230	DATE STARTED: 12-12-91
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 7 OF 8/10

K.M. 1-16-92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
60							
60.8 615	12-18-91 0915 53648	3 6 9	10	Medium dense grayish brown (2.5Y, 5/2) medium sand with fine gravel, damp	SP	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
63.4				Water Level ▽			The water level = 63.4 ft. below the ground surface on 12-21-91 at 1230
65	12-18-91 1030 53649	5 6 13	10	Medium dense grayish brown (2.5Y, 5/2) fine gravel with sand, wet	GW ~~SW~~ K.M. 12-18-91	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
70							
71.5	12-18-91 1417 53650	2 3 5	18	Loose ~~Medium dense~~ K.M. 12-18-91 grayish brown (2.5Y, 5/2) SAND with ~~fine~~ a little gravel, wet K.M. 12-18-91	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
75							

NOTES

12-18-91 215

Hnu S/N: 711111 .2 ppm
Bγ S/N: 73937 40 cpm
α S/N: 73908 0 cpm
} Background Levels

402-11-88

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 2400	COORDINATES:	DATE 12-18-91
ELEVATION:	GWL: Depth 63.4 Date/Time 12-21-91 1230	DATE STARTED: 12-12-91
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 12-20-91
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 8 OF 8/10

K.M. 1-16-92

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
75	12-18-91 1500 53651	3 6 9	14	Medium dense grayish brown (2.5Y, 5/2) SAND with fine gravel, wet	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
76.5							
80							
80.4	12-18-91 1549 53652	5 7 6	5	Same as above	SW	N/A	Hnu = .2 ppm Bγ = 40 cpm α = 0 cpm
				Bottom of Bore Hole Drilled to 80 ft. Depth of sampling - 81.5 ft.			

NOTES:

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402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS FWMF		
BORING NUMBER: 1729	COORDINATES:	DATE: 1/13/92	
ELEVATION: 591 ft	GWL: Depth / Date/Time	DATE STARTED: 1/13/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth / Date/Time	DATE COMPLETED: 1/13/92	
DRILLING METHODS: Hollow Stem Augers		PAGE 1 OF 10/12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 (in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		1	6	Soft. 10YR (5/4) Yellowish brown silty clay. Medium plasticity, moist	Cl	.25	Hand Auger 6". Sample 101409 & trip blank 101410 (0845)
	101411 (0900)	3	6	Soft. 10YR (5/4) Yellowish brown silty clay. Medium plasticity, moist.	Cl	.25	HNU = 0ppm BS = 0cpm
1		3	0	No Recovery.	NA	NA	
		6	0	No Recovery..	NA	NA	
2	101412 (0950)	11	6	Very stiff. 2.5Y (6/3) Light yellowish brown gravelly sandy clay. No plasticity Moist.	Cl	2.25	HNU = 0ppm BS = 0cpm
		13	6	SAA.	Cl	2.25	

DSO 1/13/92

NOTES:
Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombacher
Driller: Clay Gardner, Kevin Myers

SAA - same as above
NA - not applicable

Background:
HNU = 0ppm
BS = 30ppm

Background has been subtracted out.

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 91602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1729	COORDINATES:	DATE: 1/13/92	
ELEVATION: 591 ft	GWL: Depth Date/Time	DATE STARTED: 1/13/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/13/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 2 OF 10 12	

CB 2141

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101413 (0950)	15	6	Hard. 2.5Y (6/3) Light yellowish brown clayey sand. Moist	SC ~~SC~~ ~~DO~~ 2/3/92	NA ~~4.0~~	
		17	6	SAA.	2/3/92 SC ~~SC~~	NA ~~3.75~~	
4	101414 101415 (1015)	11	6	Loose. 10YR (5/6) Yellowish brown. Gravelly coarse sand, moist	SW ~~SC~~ ~~DO~~ 2/3/92	NA	HNU = 0 ppm; BZ = 0 ppm.
	101416 101417 (1015)	8	6	SAA	SW ~~SC~~ ~~DO~~ 2/3/92	NA	
5		13	0	No Recovery.	NA	NA	
		12	0	No Recovery.	NA	NA	

NOTES:

Drilling Contractor: ~~Pennsylvania Drilling~~

Drilling Equipment: Bombardier

Driller: Elay Gardner
Kevin Myers

SAA - SAME AS ABOVE
NA - Not applicable

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402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS FWMF		
BORING NUMBER: 1729	COORDINATES:	DATE: 1/13/92	
ELEVATION: 591 ft	GWL: Depth Date/Time	DATE STARTED: 1/13/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/13/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 3	OF 10/12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101418 (1030)	5	6	Loose. 10YR(5/6) Yellowish brown. Gravelly coarse sand, moist	SW	NA	HNU = 0ppm BZ = 0ppm
		7	6	SAA	SW	NA	
7		9	6	SAA	SW	NA	
	101419 (1030)	12	6	Medium dense. 10YR(5/6) Yellowish brown, fine clayey sand, moist.	~~SC~~ ~~SC~~ ~~DSO~~ 2/3/92	NA	
8	101419 101420 (1045)	1 Shelby	24 ~~27~~ ~~DSO~~ 2/3/92	SAA	~~SC~~ ~~SC~~ ~~DSO~~ 2/3/92	NA	Shelby pushed from 8-10'.

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombadier

Driller: Elgy Gardner
Kevin Myers

SAA - Same As Above
NA - Not Applicable

219

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS FCUMF		
BORING NUMBER: 1729	COORDINATES:	DATE: 1/13/92	
ELEVATION: 591 ft	GWL: Depth / Date/Time	DATE STARTED: 1/13/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth / Date/Time	DATE COMPLETED: 1/13/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 4 OF 4	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	Shelby 1						
101421 (1040)	Shelby 1			Hard 5Y(5/1) Gray gravelly clay with Low plasticity moist DO 1/13/92	Cl	>4.5	
10	101422 (1050)	13	6	Hard. 5Y(5/1). Gray gravelly clay with sand stringers. Low plasticity, moist.	Cl	>4.5	HNU=0ppm BZ=0ppm
		15	6	SAA	Cl	>4.5	
11		11	0	No Recovery.	NA	NA	
		16	0	No Recovery.	NA	NA	

CB 2/4/92

NOTES:

SAA - SAME AS ABOVE
NA - Not applicable

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombadier
Driller: Elay Gardner
Kevin Myers

220

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 91602-3.22	PROJECT NAME: Fernald RI/FS FWMF		
BORING NUMBER: 1729	COORDINATES:	DATE 1/13/92	
ELEVATION: 591 ft	GWL: Depth Date/Time	DATE STARTED: 1/13/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/13/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 5	OF 10/12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101423 101424 (1120)	21	3	Very stiff. 5Y (5/1) Gray gravelly clay, low plasticity moist	cl	3.5	HNU=0ppm RSO=0cpm
	101425 101426 (1120)	24	6	Hard, SAA.	cl	>4.5	
13	101427 101428 (1120)	34	6	Very stiff, SAA	cl	2.5	
		24	0	No Recovery.	NA	NA	
14		2	0	No Recovery	NA	NA	~~HNU=0ppm~~ ~~RSO=0cpm~~ DSO 1/13/92
		6	0	No Recovery.	NA	NA	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombadier

Driller: Elay Gardner
Kevin Myers

SAA - Same as above
NA - Not applicable

DSO 1/13/92

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS FWMF		
BORING NUMBER: 1729	COORDINATES:	DATE: 11/13/9	
ELEVATION: 591 ft	GWL: Depth Date/Time	DATE STARTED: 11/3/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 11/13/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 11	OF 10 12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		9	0	No Recovery	NA	NA	
		9	0	No Recovery	NA	NA	
16	101429 (1330)	2	6	Very stiff. Dy (10YR) gray gravelly clay, low plasticity moist	CL	3.25	HNU=0ppm BZ=0ppm
		8	0	No Recovery.	NA	NA	
17		9	0	No Recovery.	NA	NA	
		11	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombadier

Driller: Elgy Gardner
Kevin Myers

SAA - same as above
NA - not applicable

222

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS FWMF		
BORING NUMBER: 1729	COORDINATES:	DATE: 11/13/92	
ELEVATION: 591 ft	GWL: Depth / Date/Time	DATE STARTED: 11/13/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth / Date/Time	DATE COMPLETED: 11/13/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 7 OF 10 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101430 101431 (1400)		34	Stiff. 5Y(5/1) Gray gravelly, sandy, clay, high plasticity, moist	cl	1.0	HNU = 0ppm BZ = 0ppm
							Shelby pushed from 18 to 21 ft.
19		Tube					
20		Shelby					

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombadier

Driller: Elay Gardner, Kevin Myers

SAA - Same as above
NA - not applicable

223

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF	
BORING NUMBER: 1729	COORDINATES:	DATE 1/13/92
ELEVATION: 591 ft	GWL: Depth Date/Time	DATE STARTED: 1/13/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/13/92
DRILLING METHODS: Hollow Stem Auger		PAGE 8 OF 12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		3	0	No Recovery	NA	NA	
		7	0	No Recovery	NA	NA	
22		9	0	No Recovery	NA	NA	
	DSO 2/4/92	11	0	No Recovery	NA	NA	
23	~~101457~~ ~~101427~~ (1430)	7	6	Soft. 5Y (5/1) Gray gravelly sandy clay, high plasticity moist	CL ~~<.25~~ DSO 1/13/92	<.25	HNU = 0 ppm BG = 0 cpm
		14	6	SAA, very stiff.	CL ~~3.75~~ DSO 2/3/92	3.75	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Don Jamison

SAA - SAME AS ABOVE
NA - Not applicable

224

RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1729	COORDINATES:		DATE: 1/13/92
ELEVATION: 591 ft	GWL: Depth	Date/Time	DATE STARTED: 1/13/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 1/13/92
DRILLING METHODS: Hollow Stem Auger			PAGE 9 OF 12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101822 (1445)	7	6	Soft. 5Y(5/1) Gray. Gravelly clay. Moist	CL	<.25	HNU=0ppm BZ=0ppm
		9	6	SAA, Very stiff	CL	3.25	
25		20	6	SAA	CL	3.25	
		23	6	SAA	CL	3.25	
26	101422 (1505)	9	6	SAA	CL	2.25	HNU=0ppm BZ=0ppm
		20	6	SAA	CL	2.75	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner, Dan Jamison

SAA - Same as above
NA - Not applicable

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		
BORING NUMBER: 1729	COORDINATES:		DATE: 1/13/92
ELEVATION: 59154	GWL: Depth	Date/Time	DATE STARTED: 1/13/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 1/13/92
DRILLING METHODS: Hollow Stem Auger			PAGE 10 OF 12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION (DJO 1/13/92)	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		25	6	~~Soft~~ HARD BY (5/1) Gray gravelly clay high plasticity moist	CL	>4.5	
		30	6	SAA	CL	>4.5	
28	101433 101434 (1500)	50	6	SAA	CL	>4.5	HNU = 0ppm BZ = 0cpm
	101435 101436 (1500)	50	6	Loose, gray coarse clayey sand moist	SC ~~CL~~ CH 2/4/92	NA	
29	101437 101438 (1500)	65	3	SAA	SC ~~CL~~ CH 2/4/92	NA	
				Refusal	NA	NA	

NOTES.

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Elgy Gardner
Don Jamison

SAA - Same as Above
NA - not applicable

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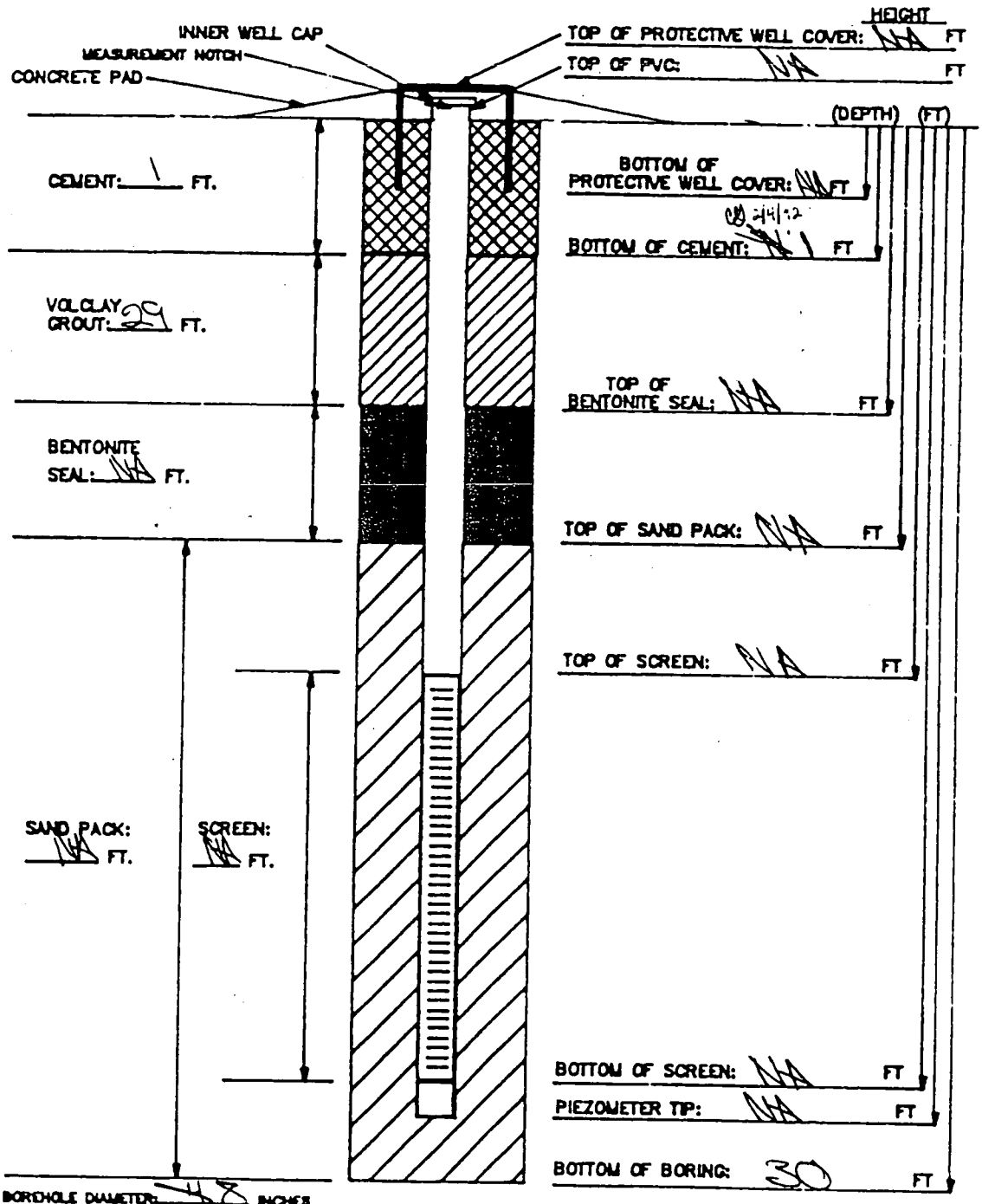
FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1729

INSTALLATION DATE: 1/18/92

2900



BOREHOLE DIAMETER: 4.8 INCHES

MATERIALS USED:
SAND TYPE AND QUANITITY: 050
BENTONITE PELLETS (5-GAL BUCKETS): 2 2/92
BAGS OF VOLCLAY GROUT: 12 bag
AMOUNT OF CEMENT: 1.2 bag
AMOUNT OF WATER USED:
OTHER:

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESIS INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22 GEOLOGIST/ENGINEER: D. O'Brien

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FERNALD RI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FLUME FIELD ENG./GEO. D.O'Brien DATE 1/13/92
PROJECT NO. 9602-3.22 CHECKED BY _____ DATE _____
BORING NO. 1729
PIEZOMETER NO. NA DATE OF INSTALLATION 1/13/92

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Augers
DRILLING FLUID (S) USED:
FLUID NA FROM NA TO NA
FLUID NA FROM NA TO NA

TYPE OF BIT NA
CASING SIZE (S) USED:
SIZE NA FROM NA TO NA
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE:
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP ~~29.0~~ 1.0 2/4/92	BOTTOM 30.0	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	30.0 ft			
GWL AFTER INSTALLATION	NA			

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

228

REMARKS 0.0 - 1.0 ft cement cap

409-11-66

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		
BORING NUMBER: 1737	COORDINATES:	DATE: 11/6/92	
ELEVATION: 604.54	GWL: Depth / Date/Time	DATE STARTED: 11/6/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth / Date/Time	DATE COMPLETED: 11/6/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 7	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		6	6	Disregard 1st 6". Used as hand auger sample. Very stiff. 10YR(3/6) Dark yellowish brown silty clay, low plasticity moist	~~NA~~ CL	~~NA~~ 2.5	6" Hand Auger Sample 101358 (1120) 101359 trip blank HNU=0ppm BX=0cpm
	101360 (1140)	7	6	Very stiff. 10YR(3/6) Dark yellowish brown. Silty clay. ~~low~~ plasticity low moist	CL	2.5	
1		9	0	No Recovery	NA	NA	
		11	0	No Recovery	NA	NA	
2	101361 (1145)	3	6	Soft. 10YR(3/8) Yellowish brown. Silty ~~sandy~~ clay. Low plasticity. Moist 11/6/92	CL	.5	HNU=0ppm BX=0cpm
		4	2	Soft 10YR(3/8) Yellowish brown. Sandy clay. Low plasticity. Very moist	CL	.5	

NOTES:

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Elgy Gardner, Don Jamison

Background: HNU=0ppm BX=40cpm
Background subtracted out
229
SAA-same as above

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF		DATE: 1/6/92
BORING NUMBER: 173	COORDINATES:		DATE STARTED: 1/6/92
ELEVATION: 1086.544	GWL: Depth	Date/Time	DATE COMPLETED: 1/6/92
ENGINEER/GEOLOGIST: D. O'Brian	Depth	Date/Time	PAGE 2 OF 5
DRILLING METHODS: Hollow Stem Auger			

DSO 2/3/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		6	0	No Recovery.	NA	NA	
		9	0	No Recovery.	NA	NA	
4	101362 101363 (1455)	3	6	Stiff. 10YR (5/8) Yellowish brown. Silty clay. No plasticity, moist	Cl	1.75	HNU=0 ppm BX=0 cpm
	101364 101365 (1458)	4	6	Medium Stiff SAA	Cl	.75	
5	101366 101367 (1455)	6	6	SAA	Cl	1.0	
		8	0	No Recovery	NA	NA	

SAA - SAME as above

NOTES:

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Elay Gardner
Dan Jamison

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FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF	
BORING NUMBER: 1737	COORDINATES:	DATE 1/6/92
ELEVATION: 606.57 ft	GWL: Depth Date/Time	DATE STARTED: 1/6/92
ENGINEER/GEOLOGIST: O. O'Brien	Depth Date/Time	DATE COMPLETED: 1/6/92
DRILLING METHODS: Hollow Stem Auger		PAGE 3 OF 57

DSO 2/3/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101360 (1500) (Rep) 101310	2	6	Soft. 10YR(5/8) Yellowish brown. Silty sandy clay, Low plasticity very moist	CL	.25	HNU = 0 ppm BG = 0 cpm
		7	6	Very soft. 10YR(5/8) Yellowish brown. Silty sandy clay Low plasticity. wet	CL	<.25	
7		7	6	SAA, soft	CL	.25	
		11	6	SAA	CL	.25	
8		7	6	SAA, very soft	CL	<.25	HNU = 0 ppm BG = 0 cpm
		7	6	SAA, Stiff	CL	1.25	

NOTES.

SAA - same as above

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Elgy Gardner
Dan Jamison

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		
BORING NUMBER: 1737	COORDINATES:	DATE 1/6/92	
ELEVATION: 1006.5	GWL: Depth Date/Time	DATE STARTED: 1/6/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/6/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 4 OF 57	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101369 (1510)	11	6	SAA top 3", Very hard bottom 3" 5Y (5/1) Gray gravelly clay, low plasticity moist.	CL	~~4.0~~	DSO 2/3/92
		22	1	SAA, soft Dense	CL	.5	DSO 2/3/92
10	101371 (1540)	1	6	~~Soft~~, 5Y (5/3) Olive. Fine grained sand. Wet.	SW	NA ~~.75~~	~~Archived~~ Full RAD of contents of Shelby Tube
		Shelby Tube	6	SAA	SW	NA ~~.5~~	
11			4	SAA	SW	NA ~~.75~~	
	~~DSG~~ 2/3/92		0	~~SAA~~ No Recovery DO 1/6/92	NA	NA	

SAA - same as above

NOTES:

Drilling Contractor: Pennsylvania Drilling
Drilling Equipment: Bombardier Mobile Drill
Driller: Elgy Gardner
Don Sumison

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FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EWMF	
BORING NUMBER: 1737	COORDINATES:	DATE: 1/14/92
ELEVATION: 604.54	GWL: Depth Date/Time	DATE STARTED: 1/14/92
ENGINEER/GEOLOGIST: O. O'Brien	Depth Date/Time	DATE COMPLETED: 1/14/92
DRILLING METHODS: Hollow Stem Auger		PAGE 5 OF 57

DSO 2/3/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		Shelby Tube	0	No Recovery	NA	NA	
		Shelby	0	No Recovery.	NA	NA	
13		2	6	Very soft. 5Y(5/1) Olive. Fine grained sands, wet.	SW	NA ~~<.25~~ GH 2/5/92	HNU = 0ppm BZ = 0ppm
		4	6	SAA	SW	NA ~~<.25~~ 2/5/92	
14		7	0	No Recovery.	NA	NA	
		8	0	No Recovery	NA	NA	Perched water zone. Abandoned hole

SAA - same as above

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Don Jamison

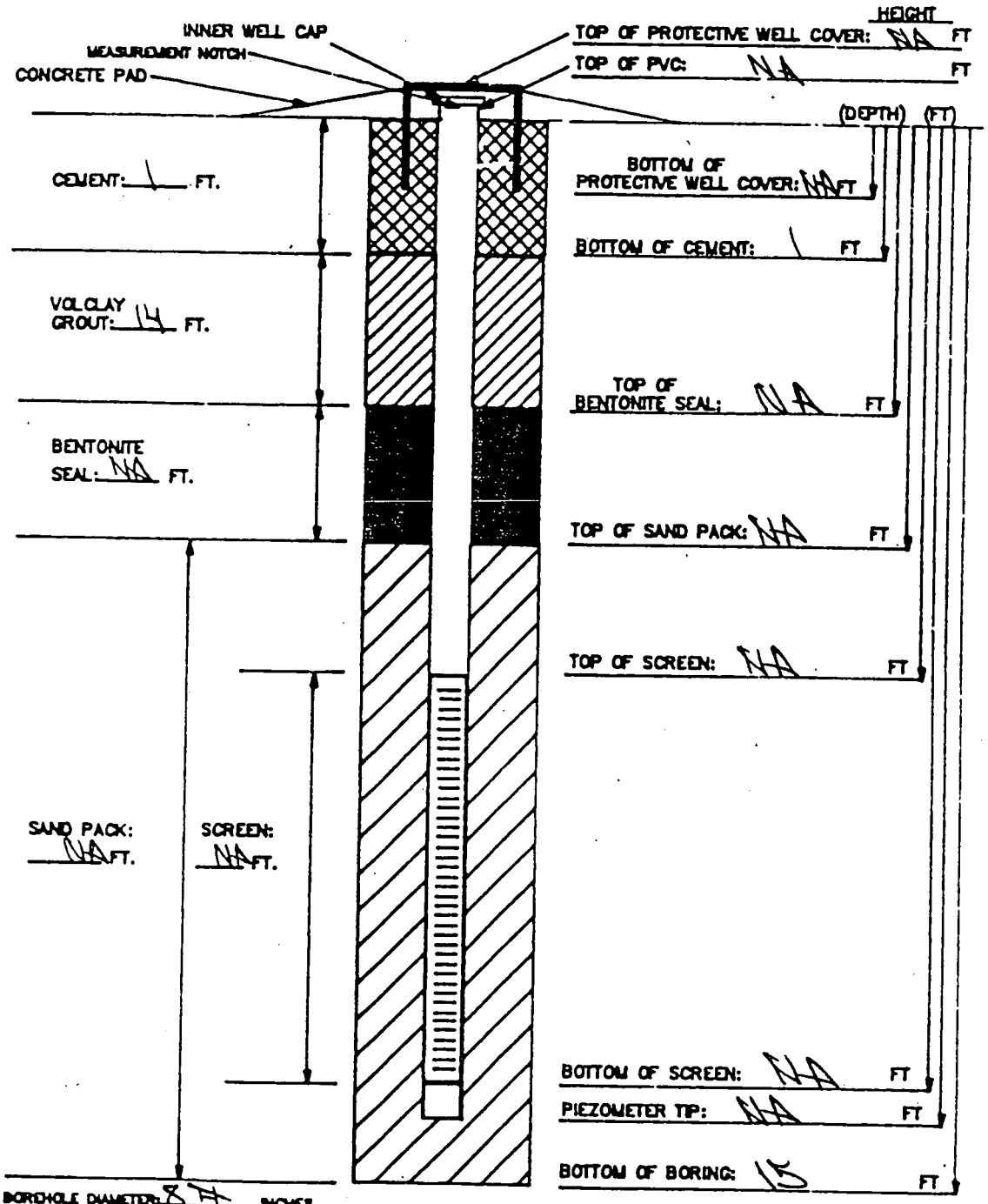
6047

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1737

INSTALLATION DATE: 1/6/92

2900



BOREHOLE DIAMETER: 8 7/8 INCHES

MATERIALS USED:
SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1
AMOUNT OF CEMENT: 1/2 bag
AMOUNT OF WATER USED:
OTHER:

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22

GEOLOGIST/ENGINEER: D. O'Brien

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FERNALD
RI/FS

797
2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FLUME FIELD ENG./GEO. D. O'Brien DATE 1/6/92
PROJECT NO. 9602-3.22 CHECKED BY [illegible] DATE 01/28/92
BORING NO. 1737
PIEZOMETER NO. NA DATE OF INSTALLATION NA

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Augers
DRILLING FLUID (S) USED:
FLUID NA FROM NA TO NA
FLUID NA FROM NA TO NA

TYPE OF BIT NA
CASING SIZE (S) USED:
SIZE NA FROM NA TO NA
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE:
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1.0	BOTTOM 15.0	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	15.0			
GWL AFTER INSTALLATION	NA			

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

235

REMARKS 0.0 - 1.0 ft. cement cap

ACS-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 4602-3.22	PROJECT NAME: Fernald RI/FS EI[illegible]F	
BORING NUMBER: 1741	COORDINATES:	DATE: 12/20/91
ELEVATION: 598.5 ft	GWL: Depth Date/Time	DATE STARTED: 12/20/91
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 12/21/91
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF 1

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		1	6	Stiff. 10YR (5/4) Yellowish brown, silty clay. Low plasticity, moist	CL	1.25	HNU = 0 ppm RS = 0 cpm Disregard top 6 inches, sampled by hand auger.
	101312 (1010) 12/20/91	2	6	Stiff. 10YR (5/4) Yellowish brown, silty clay. Low plasticity, moist	CL	1.25	
1		4	6	SAA	CL	2.0	
		7	0	No Recovery	NA	NA	
2	101313 (1015) 12/20/91	5	6	Hard. 10YR (6/8) Brownish yellow. Silty clay with organics No plasticity dry	CL	> 4.5	HNU = 0 ppm RS = 0 cpm
		7	6	SAA	CL	> 4.5	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elgy Gardner
Dan Jamison

Background:
HNU = 0 ppm
RS = 40 cpm
Background has been subtracted out.

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		DATE: 12/20/91
BORING NUMBER: 1741	COORDINATES:		DATE STARTED: 12/20/91
ELEVATION: 595.5	GWL: Depth	Date/Time	DATE COMPLETED: 12/21/91
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	PAGE 2 OF 102
DRILLING METHODS: Hollow Stem Auger			

DSO 1/27/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		9	0	No Recovery.	NA	NA	
		14	0	No Recovery	NA	NA	
4 RAD	101314 101315 (1040) 12/20/91	4	6	Hard. 10YR (6/8) Yellowish brown. Silty clay with gravel. No plasticity. Dry	CL	>4.5	HNU=0 ppm BS=0 cpm
DSO 2/4/92	101458 101316 (1040) 12/20/91	8	6	SAA	CL	>4.5	
5	101317 101318 (1040) 12/20/91	12	6	SAA	CL	>4.5	
		14	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Dan Jamison

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW IHF		DATE: 12/20/91
BORING NUMBER: 1741	COORDINATES:		DATE STARTED: 12/20/91
ELEVATION: 595.5 ft	GWL: Depth	Date/Time	DATE COMPLETED: 12/21/91
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	PAGE 3 OF ~~10~~ 13
DRILLING METHODS: Hollow Stem Auger			

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	101319 (1100) 12/20/91	9	6	Hard. 10YR (5/4) Yellowish brown. Silty clay with sand & gravel. Low plasticity Moist.	Cl	>4.5	HNU=0 ppm BZ=0 ppm
		11	6	SAA	Cl	>4.5	
7		13	6	SAA	Cl	4.0	
		15	6	SAA, very stiff	Cl	3.0	
8		20	6	Backfill, no recovery ~~CL~~ 420A	NA ~~CL~~	NA	
		26	0	No Recovery	NA	NA	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombacher Mobile Drill

Driller: Elay Gardner
Don Jamison

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		DATE 12/20/91
BORING NUMBER: 1741	COORDINATES:		DATE STARTED: 12/20/91
ELEVATION: 595.5 ft	GWL: Depth	Date/Time	DATE COMPLETED: 12/21/91
ENGINEER/GEOLOGIST: D. O'Brian	Depth	Date/Time	PAGE 4 OF ~~10~~ 12
DRILLING METHODS: Hollow Stem Auger			

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		25	0	No Recovery.	NA	NA	
		28	0	No Recovery	NA	NA	
10		14	6	Very stiff. 10YR (5/4) Yellowish brown. Gravelly clay. No plasticity. Slightly moist	Cl	3.0	HNu=0ppm BX=0cpm
		16	6	SAA	Cl	3.0	
11		14	6	SAA; hard	Cl	4.0	
		18	6	SAA, hard	Cl	>4.5	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elgy Gardner
Dan Jamison

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF		
BORING NUMBER: 1741	COORDINATES:	DATE ' 12/20/91	
ELEVATION: 593.5 ft	GWL: Depth Date/Time	DATE STARTED: 12/20/91	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 12/21/91	
DRILLING METHODS: Hollow Stem Auger		PAGE 5 OF ~~10~~ 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (CH 3/5/92)
RAD→	101320 (1400) 12/20/91	4	6	Hard. 10YR(5/4) yellowish brown gravelly clay. Low plasticity, slightly moist	CL	1.45	HNU=0ppm BG=0cpm
		7	6	SAA, very stiff.	CL	3.75	
13		8	0	No Recovery.	NA	NA	
		12	0	No Recovery.	NA	NA	
14	101321 101322 (1440) 12/20/91	2	6	Stiff. 5Y(5/1) Gray. Gravelly clay, low plasticity. Moist	CL	1.25	HNU=0ppm BG=0cpm
		4	6	SAA	CL	1.25	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Elay Gardner
Don Jamison

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		
BORING NUMBER: 1741	COORDINATES:	DATE: 12/20/91	
ELEVATION: 595.5	GWL: Depth Date/Time	DATE STARTED: 12/20/91	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 12/21/91	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF ~~10~~ 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		7	4	Stiff. 5Y(5/1) Gray Gravelly clay, low plasticity, moist.	CL	1.25	
		8	0	No Recovery.	NA	NA	
16		9	6	Stiff. 5Y(5/1) Gray Gravelly clay, low plasticity, moist.	CL	1.0	HNU=0ppm BZ=0cpm
		6	2	SAA	CL	1.25	
17		9	0	No Recovery	NA	NA	
		14	0	No Recovery.	NA	NA	

CW 2/5/92

NOTES:
Drilling Contractor Pennsylvania Drilling
Drilling Equipment Bombardier Mobile Drill
Driller: Elay Gardner
Dan Jamison

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		DATE: 12/20/91
BORING NUMBER: 1741	COORDINATES:		DATE STARTED: 12/20/91
ELEVATION: 595.5 ft	GWL: Depth	Date/Time	DATE COMPLETED: 12/21/91
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	PAGE 7 OF 12
DRILLING METHODS: Hollow Stem Auger			

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
RAD→	101323 101324 (1515) 12/20/91	4	6	Stiff. 5Y(5/1) Gray. Gravelly clay. Low plasticity, moist.	CL	1.0	HNU=0ppm RX=0cpm
		6	0	No Recovery	NA	NA	
19		6	0	No Recovery.	NA	NA	
		12	0	No Recovery	NA	NA	
20 RAD→	101325 101326 (1615) 12/20/91	Shelby Tube	27	Stiff. 5Y(5/1) Gray. Gravelly clay. Low plasticity, moist.	CL	1.0	HNU=0ppm RX=0cpm Shelby tube pushed from 20.0 to 23.0 ft
		Shelby			~~NA~~ CSO 1/27/92	~~NA~~	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Dan Jamison

402-11-86

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EU M7		
BORING NUMBER: 1741	COORDINATES:	DATE: 12/20/91	
ELEVATION: 595.54	GWL: Depth / Date/Time	DATE STARTED: 12/20/91	
ENGINEER/GEOLOGIST: D. O'Brien	Depth / Date/Time	DATE COMPLETED: 12/21/91	
DRILLING METHODS: Hollow Stem Auger		PAGE 8 OF ~~12~~ 12	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (CW 9/5/92)
		Tube					
22		Shelby					
RAD →	101322 (1615) 12/20/91						
23	101328 (0900) 12/21/91	5	6	Stiff, 5Y (5/1) Gray. Gravelly Clay. Low plasticity, wet.	Cl	1.5	HNU=0ppm BZ=0cpm
		7	6	SAA	Cl	1.5	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Dan Jamison

+02-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EW MF		
BORING NUMBER: 1741	COORDINATES:		DATE: 12/21/91
ELEVATION: 595.54	GWL: Depth	Date/Time	DATE STARTED: 12/20/91
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 12/21/91
DRILLING METHODS: Hollow Stem Auger			PAGE 9 OF ~~10~~ 12

DJO 1/27/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		11	0	No Recovery	NA	NA	
	10 ~~13~~ 25 (09:10) 12/21/91	7	6	Stiff. 5Y (5/1) Gray. Gravelly clay. Low plasticity moist.	CL	1.0	HNU = 0ppm BX = 0cpm
25		12	6	SAA	CL	1.5	
		15	6	SAA	CL	1.5	
26		6	6	Very Stiff. 5Y (5/1) Gray. Gravelly clay. Low plasticity, moist.	CL	3.25	HNU = 0ppm BX = 0cpm
		9	6	SAA,	CL	2.5	

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Clay Gardner
Don Jamison

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EU 7		
BORING NUMBER: 1741	COORDINATES:		DATE: 12/21/91
ELEVATION: 595.55 ft	GWL: Depth	Date/Time	DATE STARTED: 12/20/91
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	DATE COMPLETED: 12/21/91
DRILLING METHODS: Hollow Stem Auger			PAGE 10 OF ~~12~~ 12

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		12	0	No Recovery	NA	NA	
		12	0	No Recovery	NA	NA	
25	RAD → 101329 101330 109[illegible] 12/21/91	12	6	Stiff. 5Y (5/1) Gray. Gravelly clay. Low plasticity Moist.	CL	1.5	HNU = 0 ppm RØ = 0 cpm
	RAD → 101331 101332 109[illegible] 12/21/91	16	6	SAA	CL	1.25	
29		20	0	No Recovery.	NA	NA	
		28	0	No Recovery	NA	NA	

Bottom of Boring 30.0 FT

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elgy Gardner, Don Jamison

357 IA/FS 309

402-11-86

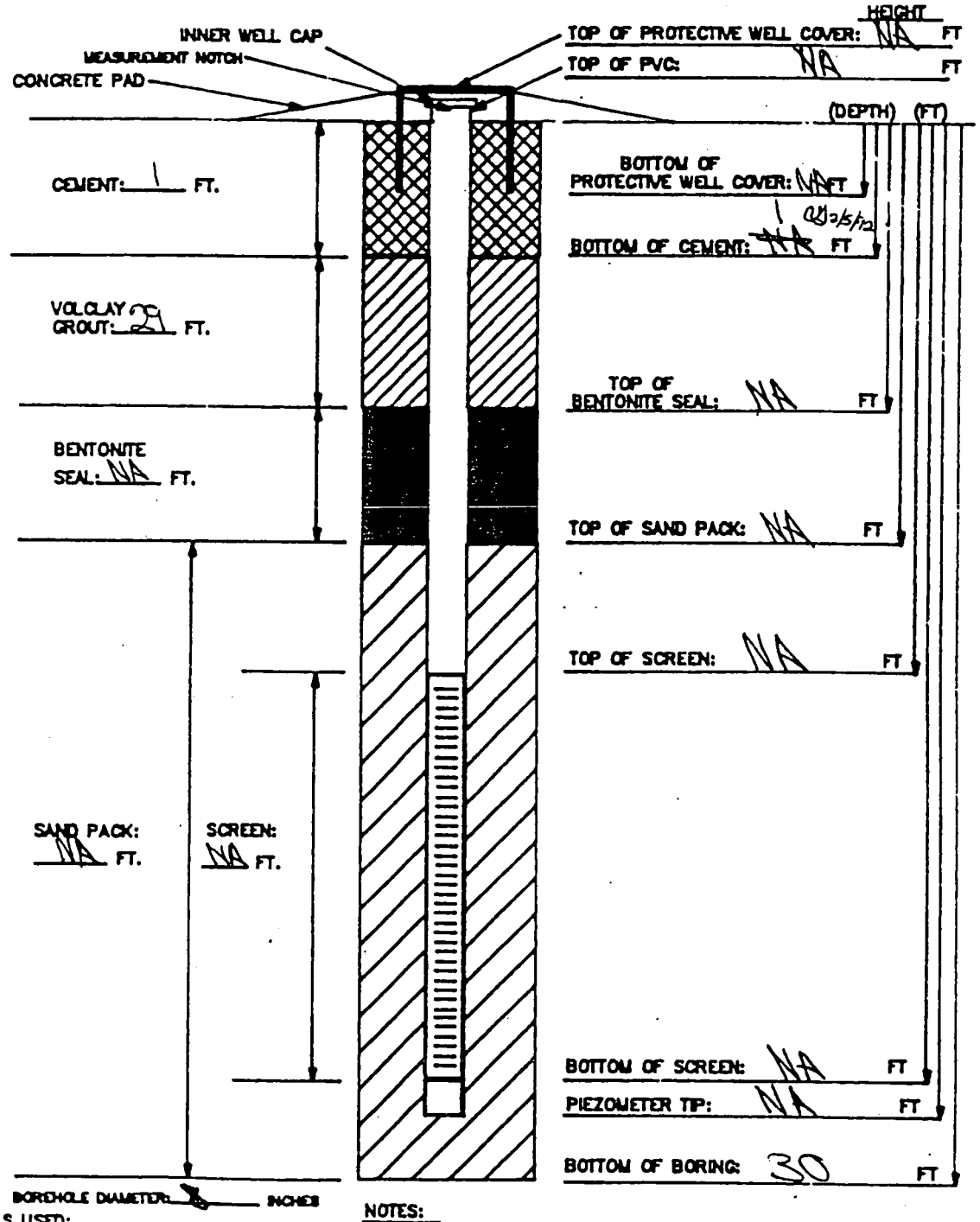
11 04 12

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1741

INSTALLATION DATE: 12/21/91

2900



MATERIALS USED:
SAND TYPE AND QUANTITY:
BENTONITE PELLETS (5-GALLON BUCKETS):
BAGS OF VOLCLAY GROUT: 2 bags
AMOUNT OF CEMENT: 1 bags
AMOUNT OF WATER USED:
OTHER:

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22 GEOLOGIST/ENGINEER: D. O'Brien

RI/FS

12 04/12

2900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fusold RI/FS FLUME FIELD ENG./GEO. D. O'Brien DATE 12/21/91
PROJECT NO. 9602-3.22 CHECKED BY [illegible] DATE 02/05/92
BORING NO. 1741
PIEZOMETER NO. NA DATE OF INSTALLATION 12/21/91

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Augers
DRILLING FLUID (S) USED:
FLUID NA FROM NA TO NA
FLUID NA FROM NA TO NA

TYPE OF BIT ~~NA~~ Hollow Augers 12/21/91
CASING SIZE (S) USED:
SIZE NA FROM NA TO NA
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE:
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1.0	BOTTOM 30.0	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	30.0			
GWL AFTER INSTALLATION	NA			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS 0.0-1.0 ft. cement cap

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409-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 3.22	PROJECT NAME: FEMP RI/FS EWMF	
BORING NUMBER: 1733	COORDINATES:	DATE 1-8-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-6-92
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth Date/Time	DATE COMPLETED: 1-8-92
DRILLING METHODS: CABLE TOOL		PAGE 1 OF ~~3~~ 2 1/23/92

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER ( )	RECOVERY ( )	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				REFER TO BORING LOGS ~~FOR~~ FROM WELL 2733 FOR (01/23/92) WELL 1733. DESCRIPTIONS ~~NO SAMPLING~~ (01/23/92) ~~WAS DONE FOR THIS WELL~~			
5							
10							
15							
20							
25							
28	100360 1700 1-7-92			Bottom of Boring at 30.0 ft			
30							

NOTES: PENNSYLVANIA DRILLING
J. BARILE - DRILLER
M. REBOLD - HELPER
C JOHNSON - SAMPLE TECH

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402-11-86

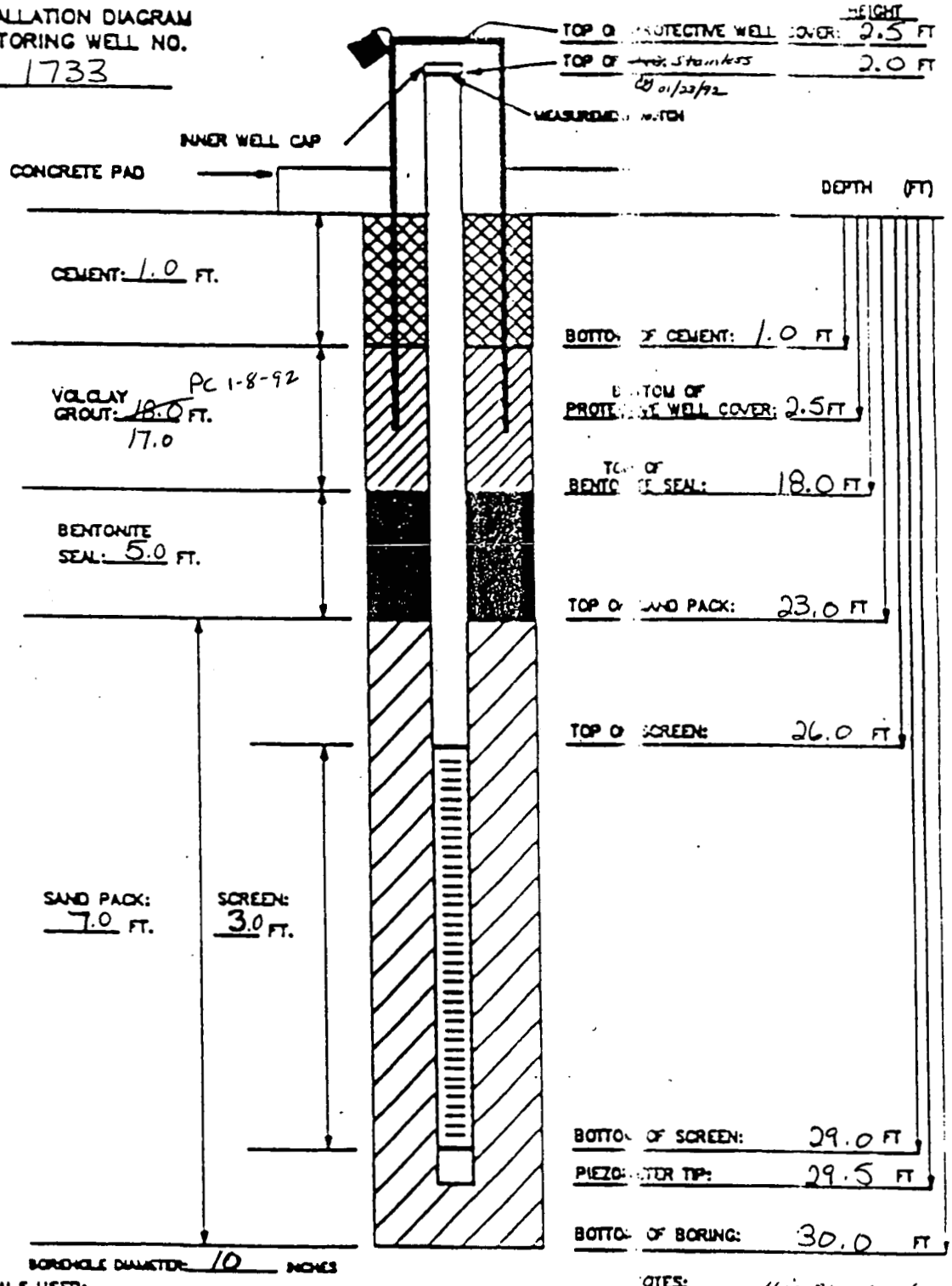
2 053

2900

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1733

INSTALLATION DATE: 1-8-92



MATERIALS USED:
SAND TYPE AND QUANTITY:
BENTONITE PELLETS (5-GALLON BUCKETS):
BAGS OF VOLCLAY GROUT:
AMOUNT OF CEMENT:
AMOUNT OF WATER USED:
OTHER:

NOTES: 4 in 316 stainless 01/23/92
1) RISER PIPE IS ~~2-inch SCHEDULE 40~~ PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS ~~2-inch~~ I.D. ~~SCHEDULE 40~~ 316 Stainless PVC PIPE WITH ~~0.020-inch SLOTS~~ 0.010 slots
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE:

602.03.22

TASK: FEMP RI/FS EWINF GEOLOGIST/ENGINEER: R.P. Casseday

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PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEMP RI/FS
PROJECT NO. 602.3 22
BORING NO. 1733
PIEZOMETER NO. 1733

FIELD ENG./GEO. R.P. CASSEDAY DATE 1-8-92
CHECKED BY _____ DATE _____
DATE OF INSTALLATION 1-8-92

BOREHOLE DRILLING

DRILLING METHOD CABLE TOOL
DRILLING FLUID (S) USED:
FLUID WATER FROM 0.0 ft TO 30.0 ft
FLUID _____ FROM — TO —

TYPE OF BIT HAMMER PECUSSION BIT
CASING SIZE (S) USED:
SIZE 10.0 in ID FROM 0.0 ft TO 30.0 ft
SIZE _____ FROM — TO —

PIEZOMETER DESCRIPTION

TYPE MONITORING WELL
DIAMETER OF PERFORATED SECTION 4.0 in ID
PERFORATION TYPE:
SLOTS [X] HOLES [ ] SCREEN [ ]
AVERAGE SIZE OF PERFORATIONS 0.010 in
TOTAL PERFORATED AREA 3.0 ft

RISER PIPE MATERIAL 316 STAINLESS STEEL
RISER PIPE DIAMETERS:
O.D. 4 3/8 in I.D. 4.0 in.
LENGTH OF PIPE SECTIONS _____
JOINING METHOD SCREWTYPE - FLUSH JOINT THREADED

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0 ft
PROTECTIVE PIPE O.D. 10 3/4 in.

OTHER PROTECTION HINGE LOCKING COVER WITH PADLOCK

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:				
NOLCLAY GROUT / ~~SLURRY~~ CEMENT PC 1-8-92	TOP 0.0 1.0	BOTTOM 1.0 18.0	TOP	BOTTOM
BENTONITE PELLETS	TOP 18.0	BOTTOM 23.0	TOP	BOTTOM
SAND - 10/20	TOP 23.0	BOTTOM 30.0	TOP	BOTTOM
GRAVEL - NONE USED	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 28.0 PC 1-8-92	BOTTOM 29.0	TOP	BOTTOM
PIEZOMETER TIP	29.5 ft			
BOTTOM OF BOREHOLE	30.0 ft			
GWL AFTER INSTALLATION				

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

REMARKS _____

250

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602 3.22	PROJECT NAME: FEMP RI/FS		
BORING NUMBER: ~~2730~~ DES 1/8/92 2733	COORDINATES:		DATE 12 11 91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12.11.91
ENGINEER/GEOLOGIST: J WHEAT	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: Cable tool			PAGE 1 OF 19

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	100301 10:00 12:11:91	3	6	Stiff, yellowish brn (10YR 5/4) silty clay dry moist low plasticity CB 01/21/92	CL	1.5	Archive
1	"	12	6	S/A	CL	1.5	NA
	"	17 ~~4~~ 11 4 CB 01/21/92		S/A	CL	1.5	NA
2	100302 11:00 12·11·91	~~26~~ 17 CB 01/21/92	6	HARD, (10YR 7/6), yellow, silty clay, dry	CL	>4.5	Archive
	"	25 ~~30~~ CB 01/21/92	4	S A H	CL	>4.5	
3	"	34 ~~42~~ 5 CB 01/21/92	0	~~S A H~~ CB 01/21/92 No Recovery	~~CL~~ NA	NA	

NOTES

-02-11-00

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602 3.22	PROJECT NAME: ENMF RI/FS FRMP		
BORING NUMBER: ~~2730~~ 2735 DOS 1/13/92	COORDINATES:	DATE 12 11 91	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 12 11 91	
ENGINEER/GEOLOGIST: J. Wheat	Depth Date/Time	DATE COMPLETED: 01-06-92	
DRILLING METHODS: Cable tool		PAGE 2 OF 19	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3	100303 1100 12/11/91	26	6	very dense, (10YR 8/6) yellow clayey silt, ~~trace~~ sand gravel, dry	ML	N/A	
	"	36	6	SAA	ML	N/A	
4	"	42	0	No ~~Lo~~ Recovery	N/A	NA	
	100304 1100 12/11/91 100319 Rodscion	55	6	~~very dense~~ Hard (10YR 8/3) very pale brn, sandy clay, some sand and gravel, dry	~~CH~~ CL	>4.5	Disc. Geotech
5	"	54	6	SAA	CL	>4.5	
	"	40	6	SAA	CL	>4.5	
6							

NOTES
Sample # 100301 Archive 0-18"
Sample # 100302 " " 18-36"
" " 100303 " " 3-4.5
" " 100304 ~~"~~ 4.5-6 disturbed geotech
6-8

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VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602 3.22	PROJECT NAME: ENMF RI/FS FEMP		
BORING NUMBER: DSS 1/2/53 2538-2733	COORDINATES:		DATE 12·11·91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12·11·91
ENGINEER/GEOLOGIST: J. Wheat	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: Cable tool			PAGE 3 OF 19

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
6	100304 11:00 12·11·91	42	6	HARD (10YR 8/6) yellow, silty clay, dry	CL	>4.5	dist. geotect
7	"	50/.2	2	SAA	CL	>4.5	
	"	NA	0	No Recovery	NA	NA	
8	100304 1630 12·11·91	11 10 ~~6~~	6 ~~12~~	HARD (10YR 8/8) yellow, silty clay with some sand and gravel, moist	CL	>4.5	disturbed geotech
	"	23 ~~2~~	2 ~~23~~	SAA	CL	>4.5	
9	"	32 ~~0~~	0 ~~32~~	No Recovery	NA	NA	

NOTES

-02-11-88

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602 3.22	PROJECT NAME: EWMF RI/FS FEMP		
BORING NUMBER: ~~2730~~ DES 1/13/92 2733	COORDINATES:		DATE 12 11 91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12 11 91
ENGINEER/GEOLOGIST: J. Wheat	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: Cable tool			PAGE 4 OF 19

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	100305 1700 121191	5 ~~6~~ CB 01/30/92	6 ~~5~~	very stiff, 10YR 6/6, brownish yellow, silty cly, with sand and gravel, moist	CL	4.0	Archive
	"	12 ~~6~~ CB 01/30/92	6 ~~0~~	SOA	CL	4.0	
10	"	20 ~~1~~ CB 01/30/92 CB 01/30/92	1 ~~20~~	SOA	CL	4.0	
	100306 1700 121191	3 ~~6~~ CB 01/30/92	6 ~~3~~	medium stiff, 10YR 6/6, gray, cly, with some sand & gravel, moist	CL	1.0	Archive
11	"	9 ~~6~~ CB 01/30/92	6 ~~9~~	SOA	CL	1.0	
	"	18 ~~1~~ CB 01/30/92	1 ~~18~~	SOA	CL	1.0	
12							

NOTES

402-11-66

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602 3.22	PROJECT NAME: ENMF RI/FS FEMP		
BORING NUMBER: ~~2730~~ 2733 DCS 1/13/92	COORDINATES:		DATE 12/12/91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12/11/91
ENGINEER/GEOLOGIST: J. Wheat	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: Cable tool			PAGE 5 OF 19

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
12	100307 1600 121291 100309 1600 121291	3	6	Very stiff, 10YR 5/1, gray clay, with some sand & gravel moist	CL	3.5	HNU 0 ppm BY 0 cpm Geochemical spoon
	100309 1600 121291 100310 1600 121291 RAD SCREEN	7	6	SAA	CL	3.00	
13	100311 1600 121291 100312 1600 121291 RAD SCREEN	13	6	SAA	CL	3.5	
		21	0	No Recovery	NA	NA	
14	100313 1600 121291	~~20~~ Shelby	~~6~~ 0.5	Stiff, 10YR 5/1, gray, clay with some sand and gravel, moist	CL	1.25	Shelby Tube pushed from 14.0 to 17.0 FT shelby tube
	100314 1600 121291 RAD SCREEN	~~10~~	~~6~~ 0.5	SAA	CL	1.5	shelby tube
15							

NOTES

3 RAD screens
3 geochemical tubes

402-11-88

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602 3.22	PROJECT NAME: ENMF RI/FS FEMP		
BORING NUMBER: 023 111332 ~~2730-2733~~	COORDINATES:		DATE 12 12 91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12 11 91
ENGINEER/GEOLOGIST: J. Wheat	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: Cable tool			PAGE 6 OF 19

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15		Shelby		SAA	CL	NA	
		Shelby	30"	SAA	CL	NA	
16		Shelby		SAA	CL	NA	
	100315 1600 121291 240 screen			SAA	CL	NA	
17	100316 1600 121291	3	6	Very stiff, 10YR 5/1, gray clay some sand and gravel, moist	CL	2.5	Archive
18		13	6	SAA	CL	2.5	

NOTES:

-02-11-88

VISUAL CLASSIFICATION OF SOILS

OJECT NUMBER. 602 3.22	PROJECT NAME. ENMF RI/FS FEMP		
BORING NUMBER: 2737 DOS	COORDINATES:		DATE 12 12 91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12 11 91
ENGINEER/GEOLOGIST. J. Wheat	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: Cable tool			PAGE 7 OF 19

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
18	100316 1600 12-12-91	15	4	SOA	CL	2.0	
18.5				Log continues on next page			

NOTES

-02-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 102.3 22	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: ~~2730~~ 1-4 PC 2733	COORDINATES:		DATE: 12-18-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12-11-91
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: CABLE TOOL			PAGE 8 OF 19

DEPTH (Ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS *Readings are minus Background
18.5	1278 900 ~~100315~~ PC 12-18 100320	4	6	HARD (2.5Y, N5/) GRAY CLAY WITH INTERMITTENT GRAVEL, SOME SILT. DRY, NOT VERY PLASTIC	>4.0	CL	HNU = 0ppm α = 0 cpm BB = 0 cpm
19.0		8	6	SAA	>4.0	CL	HNU = 0 ppm α = 0 cpm BB = 0 cpm
		12	2	SAA	>4.0	CL	HNU = 0 ppm α = 0 cpm BB = 0 cpm
20.0	12-18 PC ~~1150~~ 1115 100321	↑	30	MEDIUM DENSE (2.5Y, N5/) GRAY CLAY WITH MINOR SILT, VERY PLASTIC, ALMOST FLOWS WET.	~~2.0~~ CL	2.0	SHELBY TUBE PUSHED 20.0' - 23.0' - NO RECOVERY, PUSHED AGAIN AT NEW SPOT, SAME DEPTH, FULL RECOVERY
	RAD SCREEN (BP) 100322	SHELBY TUBE PUSHED			~~NA~~	~~NR~~	BB = 0 cpm α = 0 cpm HNU = 0 ppm
21.0	RAD SCREEN BOTTOM 100323						
21.5 ~~20.5~~							

NOTES: PENN DRILL
DRILLER - J. BARILE
HELPER - J. STRAPPAZON
SAMPLE TECH - C. JOHNSON, D. SPATTA

NOTE - PAUL CASSEDAY ASSUMED RESPONSIBILITY FOR WELL ~~2733~~ 2733 ON 12-18-91 AT DEPTH OF 18.5 FT AND ASSUMES NO RESPONSIBILITY FOR ANY LOGS NOTES OR SAMPLES FOR THIS WELL PRIOR TO 12/18/91

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

Paul Casseday

Background Reading
α = 0 cpm
BB = 20-60 cpm
HNU = 0 ppm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.322	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: W-~~2730~~ PC 2733	COORDINATES:		DATE: 12-18-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12-11-91
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: CABLE TOOL			PAGE 9 OF 19

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
21.5							
22.0		SHELBY TUBE PUSHED					
22.5				VERY ~~DENSE~~ STIFF (2.5Y, N5/) GRAY CLAY WITH SOME SILT AND SAND, GRAVEL BACKING. SLIGHTLY MOIST, NOT VERY PLASTIC	CL	2.0	
				~~AR~~ CJ 01/20/92			
23.0	100324 1510 12-18	3	6	SILT (2.5Y, N5/) GRAY CLAY WITH GRAVEL AND SILT THROUGHOUT, WET AND PLASTIC	CL	0.30	TOOK GEOCHEM SAMPLE 23.0'-25.0' FULL RECOVERY IN EACH SLEEVE.
23.5	100325 RAD SCREEN						
	100326 1510 12-18	7	6	SAA	CL	0.25	
	100327 rad screen						
24.0	100328 1510 12-18	9	6	SAA	CL	0.25	
	100329 rad screen						
24.5							

NOTES: PENN DRILL
DRILLER - J BARNE
HELPER - J STRAPPAZON

NR - NO RECOVERY
NA - NOT APPLICABLE
SAA - SAME AS ABOVE

SAMPLE TECH - CHRIS JOHNSON DAVE SRATTA

402-11-86

RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 6.02.3.22	PROJECT NAME: FEMP RI/FS EU-MF		
BORING NUMBER: W-~~2730~~ 2733	COORDINATES:	DATE: 12-18-91	
ELEVATION:	GWL: Depth / Date/Time	DATE STARTED: 12-11-91	
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth / Date/Time	DATE COMPLETED: 01-06-92	
DRILLING METHODS: CABLE TOOL		PAGE 10 OF 19	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
24.5	100330 1510 12-18 100331 Replicate	14	6	MEDIUM STIFF, ~~MEDIUM DENSE~~ (2.5Y N5/) GRAY CLAY WITH MINOR PEBBLES AND SOME SILT, SLIGHTLY MOIST, SLIGHTLY PLASTIC. (LJ 01/30/92)	CL	1.0	DECREASE IN MOISTURE TOP TO BOTTOM MAY BE FROM WATER USED TO DRIVE CASING HNU = 0 ppm α = 0 cpm βγ = 0 cpm
25.0	100332 1215 1525	5	6	VERY SOFT, ~~MEDIUM DENSE~~ (2.5Y, N5/) GRAY CLAY WITH SOME PEBBLES, MINOR SILT THROUGHOUT WET, FLOWS. (LJ 01/30/92)	CL	0.25	HNU = 0 ppm α = 0 cpm βγ = 0 cpm VERY WET. EITHER FROM DRILL WATER OR perched water zone
		5	0	NR	NA		
26.0		7	0	NR	NA		
27.0	12-18 1535	5	6	VERY STIFF, ~~MEDIUM DENSE~~ (2.5Y, N5/) GRAY CLAY WITH SOME SILT AND GRAVEL. SLIGHTLY MOIST, MINOR PLASTICITY. (LJ 01/30/92)	CL	2.5	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
		7	6	SAA	CL	3.0	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
27.5							

NOTES: PENN DRILL
DRILLER - J BARILE
HELPER - J. STRAPPAZON

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

260

SAMPLE TECH - C. JOHNSON, D. SPATTA

402-11-81

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 6.02.3.22	PROJECT NAME: FEMP RI/FS EWMU	
BORING NUMBER: W-~~2730~~ PC-1-4 2733	COORDINATES:	DATE: 12-18-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 12-11-91
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: CABLE TOOL		PAGE 11 OF 19

DEPTH (FT.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6in.	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	12-18 1535	15	6	(CH) 01/30/92 VERY STIFF, ~~MEDIUM DENSE~~ (2.5Y, N5/) GRAY CLAY WITH SOME GRAVEL SAND AND SILT, SLIGHTLY MOIST MINOR PLASTICITY.	CL	2.5	HNU = 0 ppm α = 0 cpm BR = 0 cpm
23	12-18 1550 100333	7	6	(CH) 01/30/92 ~~VERY SOFT~~, MEDIUM DENSE (2.5Y, N5/) GRAY CLAYEY SILT WITH SOME GRAVEL VERY WET, FLOWS.	ML ~~CL~~ ML (CH) 01/30/92	NA	HNU = 0 ppm α = 0 cpm BR = 0 cpm PERCHED WATER. FILL 2" OD 2nd RAD SCREEN
		11	0	NR	NA	NA	HNU = NA BR = NA α = NA TAKEN
29.0		14	0	NR	NA	NA	2 FT SPOON TAKEN DISREGARD LINE AT 29.5 HNU = NA BR = NA α = NA
		7	0	(CH) 01/30/92 NR	NA	NA	HNU = NA BR = NA α = NA
30.0				SEE TOP OF NEXT PAGE			

NOTES: PENN DRILL
DRILLER - J BARILE
HELPER - J. STRAPPAZON

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

261

SAMPLE TECH - C. JOHNSON, D. SPATTA

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 100322 PC 1-9	PROJECT NAME: FEMP RI/FS EU-NIF		
BORING NUMBER: ~~2730~~ 2733	COORDINATES:	DATE: 12-14-91	
ELEVATION:	GWL: Depth / Date/Time	DATE STARTED: 12-11-91	
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth / Date/Time	DATE COMPLETED: 01-06-92	
DRILLING METHODS:		PAGE 12 OF 19	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6in	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS βγ = 20 cpm background
30	12-14 930 100334	7	6	MEDIUM DENSE, ~~VERY SOFT~~ (2.5Y, N6/) GRAVEL WITH INTERMIXED SILT AND SAND WET, FLOWING. CH 01/30/92	~~SC~~ GC GM	~~>2.5~~ NA	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
	100335 0920 12-19	13	6	MEDIUM DENSE, ~~VERY SOFT~~ (2.5Y, N5) GRAY CLAYEY SILT WITH LARGE GRAVEL CONTENT. CH 01/30/92	ML ~~GC~~ CH 01/30/92	NA ~~>2.5~~	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
31		19	6	SAA	ML	NA ~~>2.5~~ CH 01/30/92	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
	100336 0920 12-19	15	6	MEDIUM ~~DENSE~~ STIFF, STIFF (2.5Y, N5/) CLAY WITH SILT. VERY MOIST, PLASTIC CH 01/30/92	CL ~~ML~~ CH 01/30/92	1.5	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
32	12-19 935 100337	9	6	MEDIUM DENSE, ~~VERY SOFT~~ (2.5Y N6/) GRAY GRAVEL AND CLAY MIX, VERY WET, FLOWS CH 01/30/92	GC	NA ~~>2.5~~ CH 01/30/92	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
	100338 0935 12-19	11	6	~~MEDIUM DENSE~~, MEDIUM STIFF (2.5Y, N5) GRAY CLAY WITH MINOR SILT, VERY PLASTIC, MOIST CH 01/30/92	CL	1.0	HNU = 0 ppm α = 0 cpm βγ = 0 cpm
33							

NOTES: PENN DRILL
DRILLER - J. BARILE
HELPER - J. STRAPPAZON

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

262

SAMPLE TECH - C. JOHNSON, D. SPATTA

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS EWMF	
BORING NUMBER: W-~~2730~~ PC 1-4 2733	COORDINATES:	DATE: 12-19-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 12-11-91
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: CABLE TOOL		PAGE 13 OF 19

DEPTH (Ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS (βγ = 20 cpm (Background)	
33	12-19 935 100338	11.	6	CH 01/30/92 ~~MEDIUM DENSE~~, MEDIUM STIFF (2.5Y, N5/) GRAY CLAY WITH MINOR SILT, VERY PLASTIC, MOIST.	CL	1.0	HNU = 0 ppm α = 0 cpm βγ = 0 cpm	
		14	6	SAA	CL	0.5	HNU = 0 ppm α = 0 cpm βγ = 0 cpm	
34	12-19 945	10	0	NR	NA	NA	HNU = NA βγ = NA	α = NA
		12	0	NR	NA	NA	HNU = NA βγ = NA	α = NA
35	12-19 950 100339	13	0	NR (SAMPLE FLOWED FROM SLEEVE ONTO GROUND)	NA	NA	HNU NA βγ = NA	α = NA
HEM SLEEVE	100340 100341	26	6	CH 01/30/92 STIFF, ~~DENSE~~ (2.5Y, N5/) GRAY CLAY WITH MINOR SILT AND SOME GRAVEL AND SAND, WET	CL	2.0	HNU = 0 ppm βγ = 0 cpm	α = 0 cpm
36 HEM SLEEVE	100342 100343	22	6	CH 01/30/92 STIFF (2.5Y, N5/) GRAY CLAY INTERMIXED WITH (10YR, 5/4) BROWN CLAY, SOME SILT AND SAND, GRADING TO CH 01/30/92 ~~VERY DENSE~~, DENSE (10YR, 5/4) YELLOWISH BROWN GRAVELLY SAND, WET.	CL/SM	1.5	HNU = 0 ppm βγ = 0 cpm	α = 0 cpm
BASE OF TILL	100344	31	0	NR	NA	NA	HNU = NA βγ = NA	α = NA
37								

NOTES:

PENN DRILL
DRILLER: J. BARKE
HELPER: J. STRAPPAZON

BASE OF TILL ENCOUNTERED at 36.5 ft

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

SAMPLE TECHS: C. JOHNSON, D. SPATTA

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: W-~~2730~~ PC 1-4 2733	COORDINATES:	DATE 12-19-91	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 12-11-91	
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth Date/Time	DATE COMPLETED: 01-06-92	
DRILLING METHODS: CABLE TOOL		PAGE 14 OF 19	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6/6	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
37				Sample interval will Continue at 5.0 ft intervals in Aquifer			
38							
39							
40	12-19 100345 1230	7 6 11	8	CJ 1/30/92 ~~VERY LOOSE~~, MEDIUM DENSE (10YR, 5/4) YELLOWISH BROWN, GRAVELLY SAND, MINOR SILT AND CLAY, WET	SW ~~SM~~ CJ 01/30/92	NA ~~70.35~~	HNU = 0 ppm α = 0 cpm BS = 0 cpm
41							
42							
43							
44							
45	12-19 1300 100346	38 50/.3	18	CJ 01/30/92 ~~VERY LOOSE~~, VERY DENSE (10YR, 5/3) BROWN SAND AND GRAVEL. LITTLE TO NO SILT OR CLAY. WET	SW ~~SM~~ CJ 01/30/92	NA ~~70.35~~	HNU = 0 ppm α = 0 cpm BS = 0 cpm
46							
47							
48							
49							
50	12-19 1341 100347	32 42 44	18	CJ 01/30/92 ~~VERY LOOSE~~, VERY DENSE (10YR, 4/3) DARK BROWN INTERMIX OF SAND AND GRAVEL. NO GRADING PRESENT, POORLY SORTED DRY	SW to GW	NA	HNU = 0 ppm α = 0 cpm BS = 0 cpm
51							
52							

SUPTS: PENN DRILL
DRILLER: J. BARILE
HELPER: J. STRAPPAZON
SAMPLE TECHS: C. JOHNSON, D. SPATTA

NA - NOT APPLICABLE
SAA - SAME AS ABOVE
NR - NO RECOVERY

264

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3.22	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: ~~2730~~ PC 1-4 2733	COORDINATES:	DATE 12-19-91	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 12-11-91	
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth Date/Time	DATE COMPLETED: 01-06-92	
DRILLING METHODS: CABLE TOOL		PAGE 15 OF 19	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS BG = 20 ppm (background)
~~52~~							
53							
54							
55	12-19 1605 100349	19 33 50/.3	9	CW 01-30-92 ~~LOOSE~~, VERY DENSE (10YR, 4/3) DARK BROWN SAND WITH GRAVEL (SOME VERY COARSE) POORLY SORTED, ~~POORLY GRADED~~ VERY DRY CW 2/5/92	SW ~~SP~~	NA ~~<0.05~~ CW 1/30/92	HNU = 0 ppm α = 0 cpm BG = 0 cpm
56							
57							
58							
59							
60	12-19 1659 100350	6 15 19	18	PC12-19 ~~LOOSE, VERY~~ DENSE (10YR, 5/3) BROWN SAND AND GRAVEL (SOME COARSE) POORLY SORTED, ~~POORLY GRADED~~, SLIGHTLY MOIST CW 2/5/92	SW ~~SP~~	NA ~~<0.05~~ CW 01/30/92	HNU = 0 ppm α = 0 cpm BG = 0 cpm
61							
62							
63							
64							
65	12-20 1010 100351	18 50/4	10	CW 01/30/92 ~~LOOSE~~, VERY DENSE (10YR, 5/3) BROWN SAND CONTAINING COARSE GRAVEL, POORLY SORTED ~~POORLY GRADED~~, DRY. CW 2/5/92	SW ~~SP~~	NA ~~<0.05~~ CW 1-30-92	HNU = 0 ppm α = NA BG = 0 cpm
66							
67							

NOTES:
PENN DRILL
J. BARILE - DRILLER
J. STRAPPAZON - HELPER

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

265

SAMPLE TECH. - CHRIS JOHNSON

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3 22	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: ~~2730~~ PC 1-4 2733	COORDINATES:	DATE 12-20-91	
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 12-11-91	
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth Date/Time	DATE COMPLETED: 01-06-92	
DRILLING METHODS: CABLE TOOL		PAGE 16 OF 19	

DEPTH (FT.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in.	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
67							
68							
69							
70	12-20 1045 100352	14 19 50/4	12	CH 01/30/92 ~~LOOSE~~, VERY DENSE (10YR, 5/3) BROWN SAND WITH LENSES OF COARSE GRAVEL. LITTLE TO NO SILT OR CLAY. SLIGHTLY MOIST	SP	NA ~~<0.25~~ CH 01/30/92	HNu = 0 ppm α = NA β γ = 0 cpm
71							
72							
73							
74							
75	12-20 1355 100353	20 50/.2	8	CH 01/30/92 ~~LOOSE~~, VERY DENSE (10YR, 4/3) VERY DARK BROWN SAND, POORLY SORTED. CONTAINS VARIOUS SIZED PEBBLES THROUGHOUT. LITTLE SILT OR CLAY SLIGHTLY MOIST	SW ~~SP~~	NA ~~<0.25~~ CH 01/30/92	HNu = 0 ppm α = NA. β γ = 0 cpm.
76							
77							
78							
79							water table of PENETRATED AQUIFER
80	12-20 1425 100354	11 19 38	13	CH 01/30/92 Very ~~LOOSE~~ DENSE (10YR, 5/3) BROWN COARSE SAND AND GRAVEL. POORLY GRADED. LITTLE TO NO SILT OR CLAY. WET	SP	NA ~~<0.25~~ CH 1-30-92	HNu = 0 ppm α = NA β γ = 0 cpm.
81							
82							

NOTES: PENN DRILL
J. BARILE - DRILLER
J. STRAPPAZON - HELPER

NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

SAMPLE TECH. - CHRIS JOHNSON

266

402-11-86

RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER: 602.3 22	PROJECT NAME: FEMP RI/FS EWMF		
BORING NUMBER: ~~2730~~ PZ 1-4 2733	COORDINATES:		DATE: 12-20-91 / 12-21-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12-11-91
ENGINEER/GEOLOGIST: P. CASSEDAY	Depth	Date/Time	DATE COMPLETED: 01-06-92
DRILLING METHODS: CABLE TOOL			PAGE 17 OF 19

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN.	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
~~82~~							
83							
84							
85	12-20 1630 100355	50/.4	4	CY 01/30/92 ~~LOOSE~~, VERY DENSE (10YR, 5/3) BROWN GRAVEL WITH SOME SAND AND SILT. LITTLE TO NO CLAY. COARSE, POORLY SORTED. GRAVEL ANGULAR. WET	GW ~~GP~~ CY 01/30/92	NA ~~<0.25~~	HNu = 0 ppm α = NA βγ = 0 cpm
86							
87							
88							
89							
90	12-21 1255 100356	21 50/3	9	CY 01/30/92 ~~LOOSE~~, VERY DENSE (10YR, 5/3) GRAYISH BROWN GRAVEL WITH SAND. MINOR SILT LITTLE TO NO CLAY. POORLY SORTED ~~AND GRADED~~. WET CY 01/30/92	GW ~~GP~~	~~<0.25~~ CY 01/30/92	HNu = 0 ppm α = NA βγ = 0 cpm
91							
92							
93							
94				TOTAL DEPTH = 94.0 FT.			
95							
96							
97							

NOTES: PENNSYLVANIA DRILLING
DRILLER - J. BARILE
HELPER - J STRAPPAZON
SAMPLE TECHS - C. JOHNSON, D. SPATTA

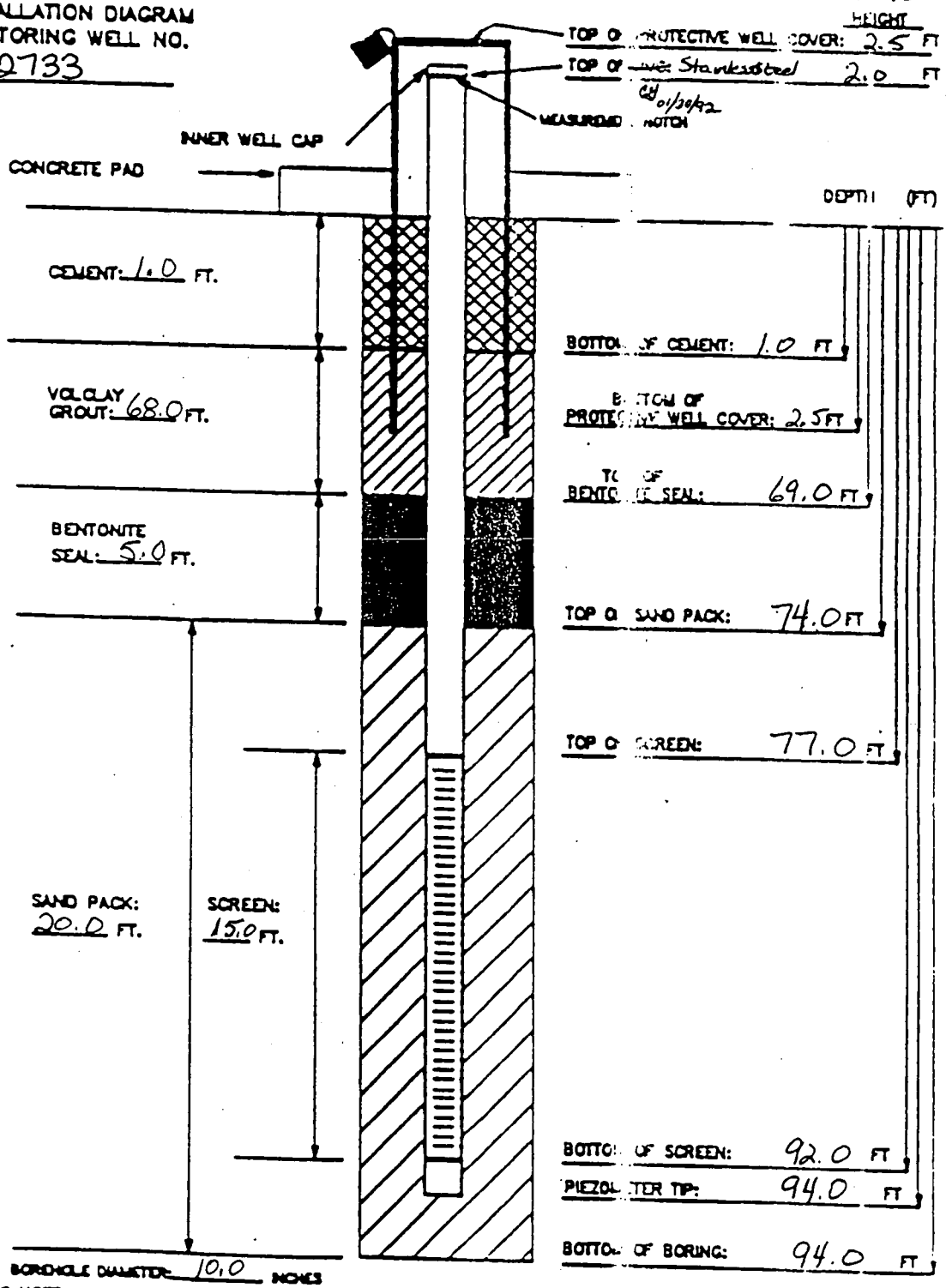
NA - NOT APPLICABLE
NR - NO RECOVERY
SAA - SAME AS ABOVE

4C2-11-86

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
2733

INSTALLATION DATE: ~~12-21-91~~ 1-6-92 CW 01/30/92



MATERIALS USED:
SAND TYPE AND QUANTITY:
BENTONITE PELLETS (5-GALLON BUCKETS):
BAGS OF VOLCLAY GROUT:
AMOUNT OF CEMENT:
AMOUNT OF WATER USED:
OTHER:

NOTES:
1) RISER PIPE IS ~~2-INCH SCHEDULE 40~~ 4 in 316 Stainless Steel CW 01/30/92 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS ~~2-INCH I.D. SCHEDULE 40~~ 4 in ID 316 Stainless Steel PVC PIPE WITH 0.010-INCH SLOTS. CW 01/30/92
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED PLUG.
4) WATER DEPTH/DATE:

TASK: 602.03.22 Femp RI/FS EWMF GEOLOGIST/ENGINEER: R. P. Gasseday

PIEZOMETER INSTALLATION SHEET

2900

PROJECT NAME FEMP RI/FS EWMF
FIELD ENG./GEO. R.P. Casseday
DATE 1-6-92
PROJECT NO. 602.3.22
CHECKED BY
DATE
BORING NO. 2733
PIEZOMETER NO. 2733
DATE OF INSTALLATION 1-6-92

BOREHOLE DRILLING

DRILLING METHOD Cable Tool	TYPE OF BIT Hammer Percussion Bit
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID Water FROM 0.0 TO 94.0	SIZE 10.0 in ID FROM 0.0 ft TO 94.0 ft
FLUID ____ FROM — TO —	SIZE ____ FROM — TO —

PIEZOMETER DESCRIPTION

TYPE Monitoring Well	RISER PIPE MATERIAL 316 Stainless Steel
DIAMETER OF PERFORATED SECTION 4.0 in ID	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. 4 3/8 in I.D. 4.0 in.
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 5-10 ft
AVERAGE SIZE OF PERFORATIONS 0.010 in	JOINING METHOD Screwtype - Flushjoint
TOTAL PERFORATED AREA 15.0 ft	Threaded

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0 ft	OTHER PROTECTION Hinge Locking
PROTECTIVE PIPE O.D. 10 3/4 in	Cap with Padlock

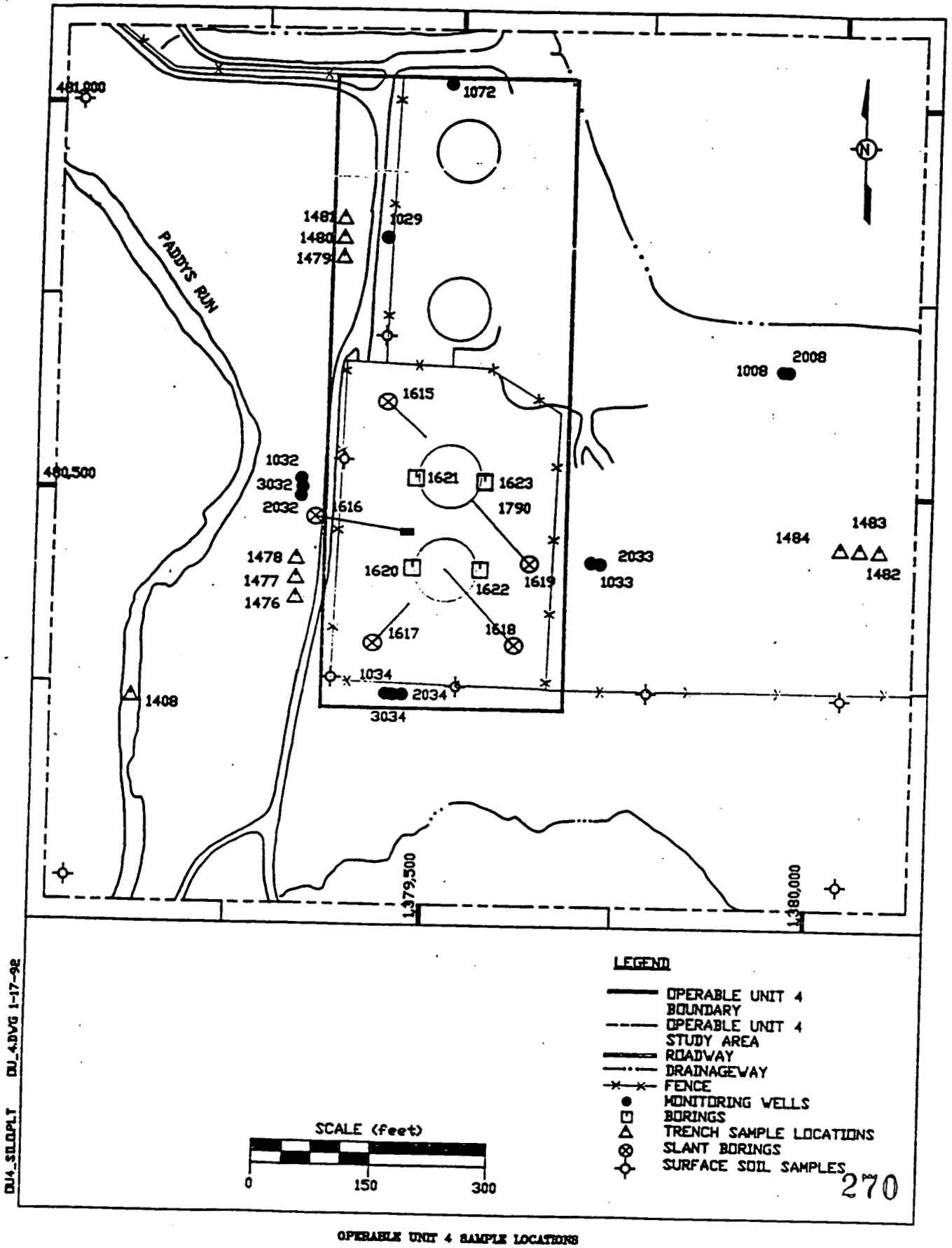
ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (Ft)		ELEVATION ( )	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS:				
Volclay GROUT / ~~SLURRY~~ CEMENT PC 1-6	TOP 0.0 1.0	BOTTOM 1.0 69.0	TOP	BOTTOM
BENTONITE Pellets	TOP 69.0	BOTTOM 74.0	TOP	BOTTOM
SAND - 10/20	TOP 74.0	BOTTOM 94.0	TOP	BOTTOM
GRAVEL - None used	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP ~~78.0~~ 77.0 PC 1-6	BOTTOM 92.0	TOP	BOTTOM
PIEZOMETER TIP	94.0			
BOTTOM OF BOREHOLE	94.0			
GWL AFTER INSTALLATION				

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

REMARKS

269

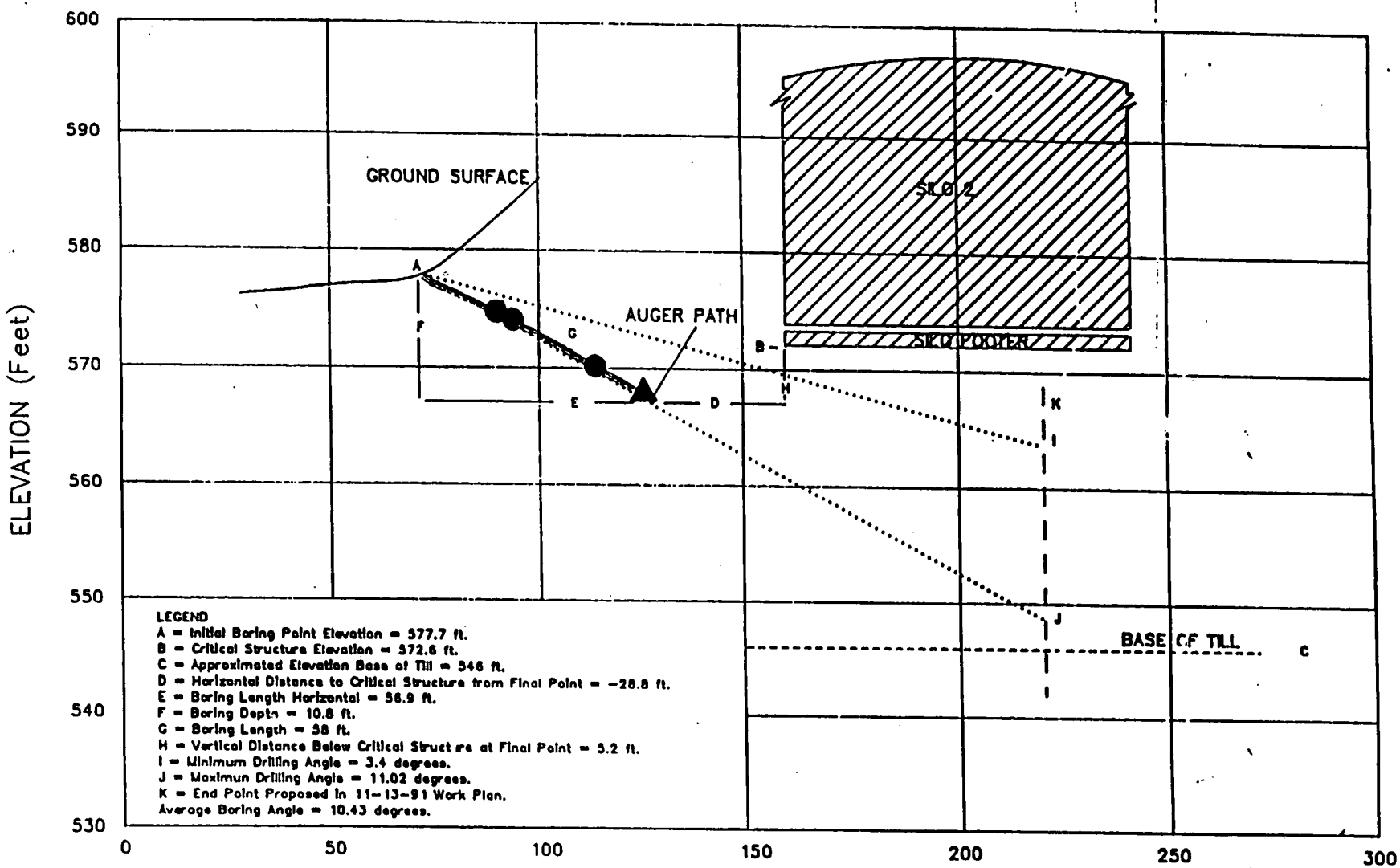
409-11-86



OPERABLE UNIT 4 SAMPLE LOCATIONS

SLANT BORING 1615 (No. 1) AT K-65 SILOS

Graph #: K65B1K. APRIL 22, 1991



▲ PERCHED GROUNDWATER SAMPLE

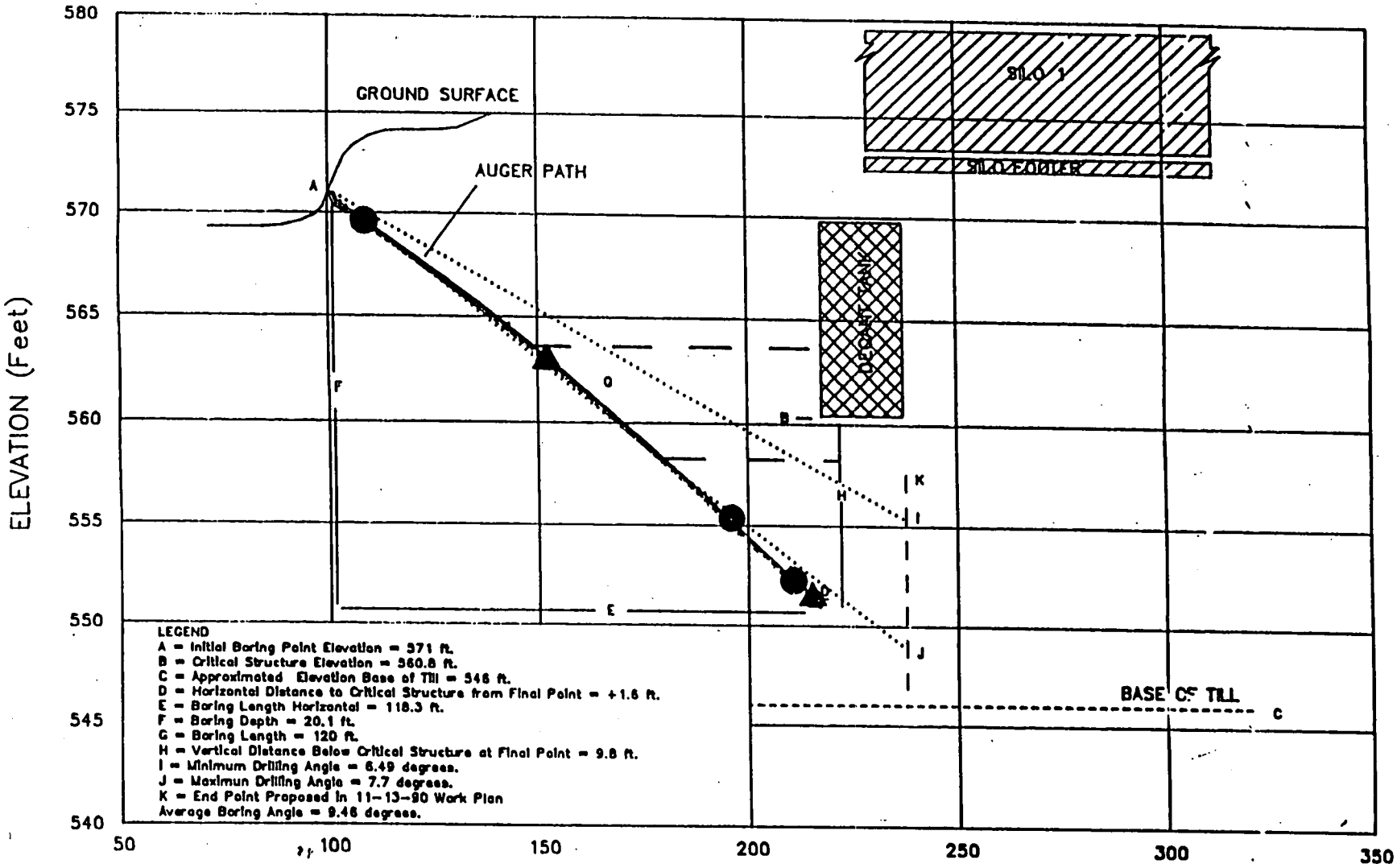
● SOIL SAMPLE - RAD or RAD, CHEM, GEOTECH

HORIZONTAL DISTANCE (Feet)

MORA_K65B1KK.DRW_ASFND_08-08-91_REV000

SLANT BORING 1616 (No.2) AT K-65 SILOS

Graph #: K65B2C. JULY 02, 1991



▲ PERCHED GROUNDWATER SAMPLE

● SOIL SAMPLE - RAD or RAD, CHEM, GEOTECH

HORIZONTAL DISTANCE (Feet)

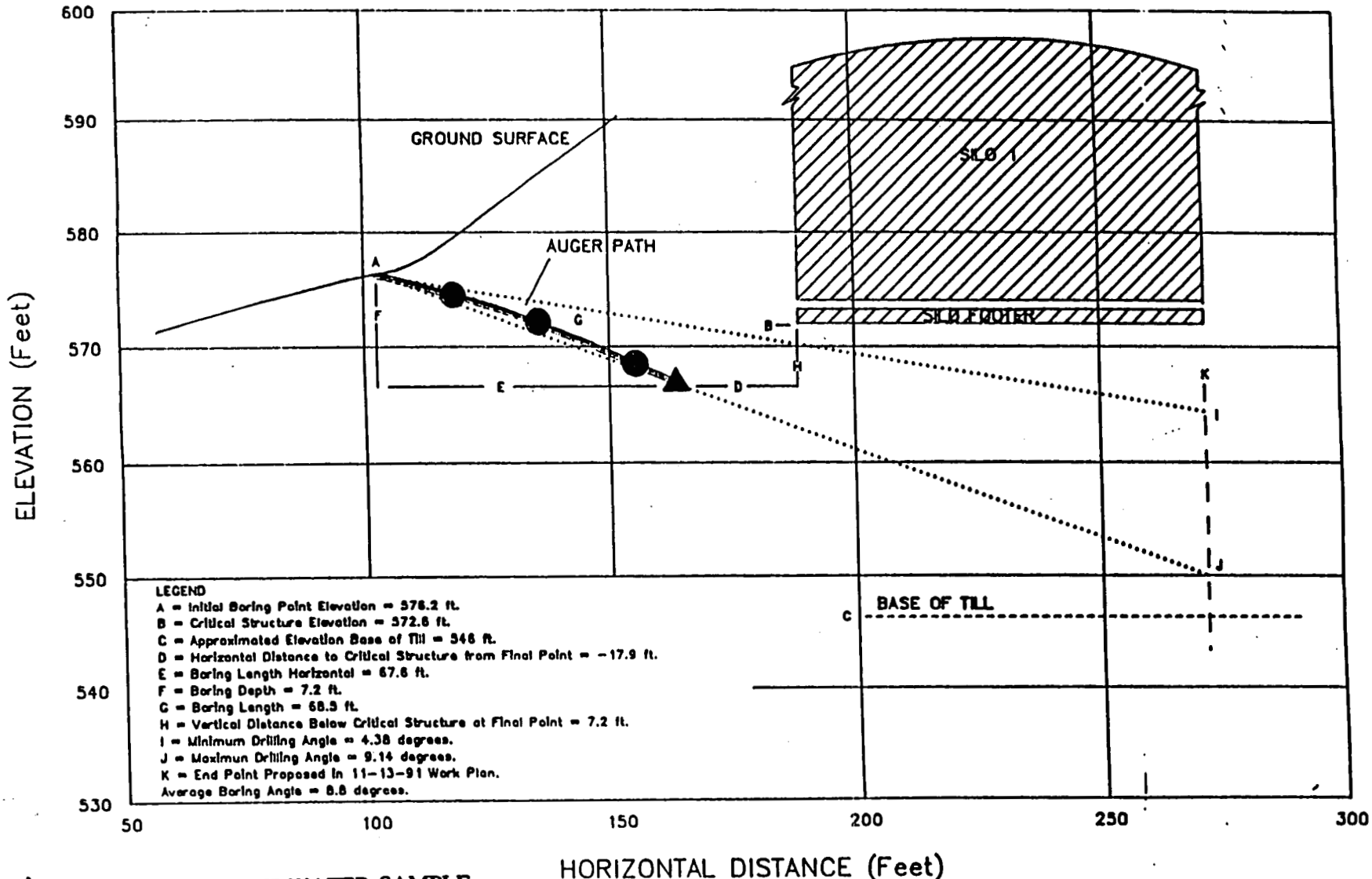
MORA_K65B2CC.DRW_ASFIED_08-08-91_REV000

272

2900

SLANT BORING 1617 (No.3) AT K-65 SILOS

Graph #: K65B3L. MAY 06, 1991



▲ PERCHED GROUNDWATER SAMPLE

● SOIL SAMPLE - RAD or RAD, CHEM, GEOTECH

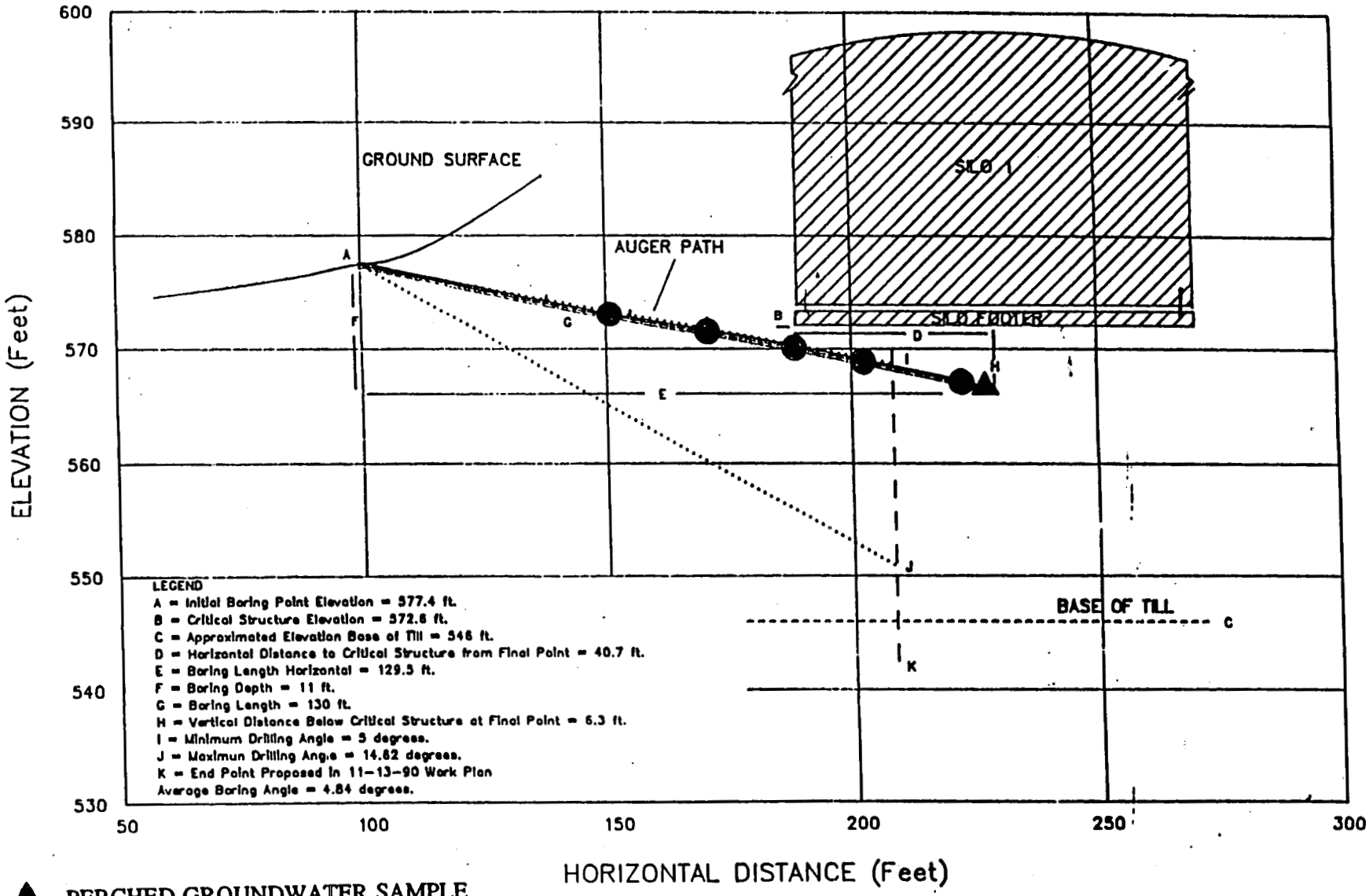
MORA_K65B3L.DRW_ASFND_08-08-91_REV000

273

2900

SLANT BORING 1618 (No.4) AT K-65 SILOS

Graph #: K65B4D. AUGUST 03, 1991



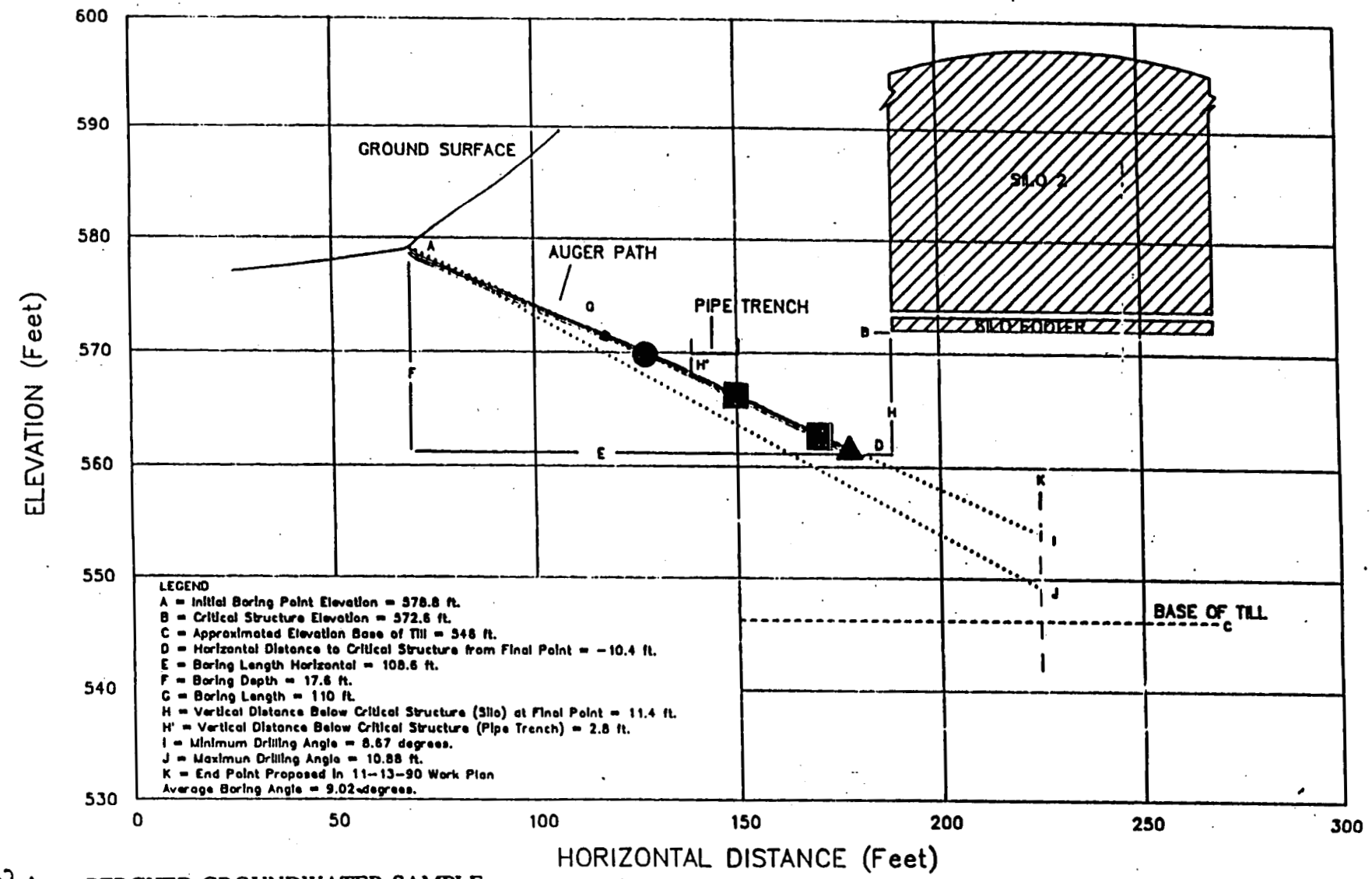
▲ PERCHED GROUNDWATER SAMPLE

● SOIL SAMPLE - RAD or RAD, CHEM, GEOTECH

MORA_K65B4D(1).DRW_ASIFND_08-08-91_REV000

SLANT BORING 1619 (No.5) AT K-65 SILOS

Graph #: K65B5C. JULY 30, 1991



▲ PERCHED GROUNDWATER SAMPLE

● SOIL SAMPLE - RAD or RAD, CHEM, GEOTECH

■ SOIL SAMPLE - GEOTECH

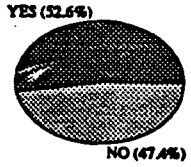
MORA_K65B5CC.DRW_ASFKO_08-08-90_REV000

K-65 SLANT BORINGS SAMPLES AND ANALYTICAL REQUEST LIST

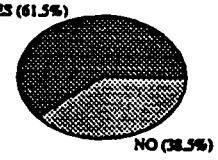
BORING No.	SAMPLE No.		CASING LENGHT	DATE COLLECTED	ANALYTICAL PARAMETERS REQUESTED					
1615	66956		14.6-15.0	04-10-91						RAD Y
1615	66957		17.50-20.00	04-18-91	FHSL Y		TBP			
1615	66958		17.50-20.00	04-18-91		TCLP Y				
1615	66959		20.00-22.5	04-18-91						RAD Y
1615	66960		20.00-22.5	04-18-91						RAD Y
1615	66961		20.00-22.5	04-18-91				GT		
1615	66966		37.50-40.00	04-20-91	FHSL		TBP			
1615	66967		37.50-40.00	04-20-91		TCLP				
1615	66968		40.00-42.50	04-20-91						RAD Y
1615	66969		40.00-42.50	04-20-91						RAD Y
1615	66970		41.25-42.50	04-20-91				GT		
1615	64007	*	57.50	05-29-91	FHSL		TBP		GGCH	RAD
1616	64030		[illegible]-85.20	06-26-91	FHSL Y		TBP			
1616	64031		83.00-85.20	06-26-91		TCLP Y				
1616	64032		88.00-89.25	06-26-91						RAD Y
1616	64033		88.00-89.25	06-26-91						RAD Y
1616	64034		89.25-90.50	06-26-91				GT		
1616	64039		103.00-104.40	06-28-91	FHSL Y		TBP			
1616	64040		103.00-104.40	06-28-91		TCLP Y				
1616	64041		105.50-106.75	06-28-91						RAD Y
1616	64042		105.50-106.75	06-28-91						RAD Y
1616	64043		106.75-108	06-28-91				GT		
1616	64157		3.92-4.42	10-10-91						RAD Y
1616	64021	*	48.00	06-21-91	FHSL Y				GGCH Y	RAD Y
1616	64052	*	120.00	07-09-91	FHSL				GGCH	RAD Y
1617	64001		59.70-61.00	05-04-91						RAD
1617	64002		59.70-61.00	05-04-91						RAD
1617	64003		61.0-62.0	05-04-91				GT		
1617	66974		17.10-17.50	04-24-91						RAD Y
1617	66981		17.50-20.20	05-02-91	FHSL Y		TBP			
1617	66982		17.50-20.20	05-02-91		TCLP Y				
1617	66983		17.50-20.20	05-02-91						RAD
1617	66984		17.50-20.20	05-02-91						RAD
1617	66985		21.50-22.50	05-02-91				GT		
1617	66990		36.50-40.20	05-03-91	FHSL Y		TBP			
1617	66991		36.50-40.20	05-03-91		TCLP Y				
1617	66992		36.50-40.20	05-03-91						RAD Y
1617	66993		36.50-40.20	05-03-91						RAD Y
1617	66994		41.50-43.50	05-04-91				GT Y		
1617	66998		58.50-59.70	05-04-91	FHSL Y		TBP			
1617	66999		59.70-61.00	05-04-91		TCLP Y				
1617	64009	*	68.50	06-10-91	FHSL				GGCH	RAD
1618	64102		47.50-48.50	07-29-91	FHSL Y		TBP			
1618	64103		47.50-48.50	07-29-91		TCLP Y				RAD
1618	64105		50.00-51.25	07-30-91						RAD Y
1618	64106		50.00-51.25	07-30-91						RAD Y
1618	64107		51.25-52.50	07-30-91				GT		
1618	64112		67.50-70.00	07-30-91	FHSL		TBP			
1618	64113		67.50-70.00	07-30-91		TCLP				
1618	64115		70.00-71.25	07-31-91						RAD Y
1618	64116		70.00-71.25	07-31-91						RAD Y
1618	64117		71.25-72.50	07-31-91				GT		
1618	64123		87.50-90.00	08-01-91	FHSL		TBP			
1618	64124		87.50-90.00	08-01-91		TCLP				
1618	64125		90.00-91.25	08-01-91						RAD Y
1618	64126		90.00-91.25	08-01-91						RAD Y
1618	64127		91.25-92.50	08-01-91				GT		
1618	64134		105.00-107.50	08-02-91	FHSL		TBP			
1618	64135		105.00-107.50	08-02-91		TCLP				
1618	64136		105.00-107.50	08-02-91						RAD Y
1618	64137		107.50-108.75	08-02-91						RAD Y
1618	64138		108.75-110.00	08-02-91				GT		
1618	64146		125.00-127.50	08-03-91	FHSL		TBP			
1618	64147		125.00-127.50	08-03-91		TCLP				
1618	64148		127.50-128.75	08-03-91						RAD Y
1618	64149		127.50-128.75	08-03-91						RAD Y
1618	64150		128.75-130.00	08-03-91				GT		
1618	64152	*	130.00	08-08-91	FHSL				GGCH	RAD Y
1619	64067		57.50-60.00	07-20-91	FHSL Y		TBP			
1619	64068		57.50-60.00	07-20-91		TCLP Y				
1619	64071		60.00-61.25	07-20-91						RAD Y
1619	64072		60.00-61.25	07-20-91						RAD Y
1619	64073		61.25-62.50	07-20-91				GT		
1619	64079		81.25-82.50	07-23-91				GT		
1619	64085		103.75-105.00	07-25-91				GT		
1619	64090	*	110.00	07-31-91	FHSL Y		TBP		GGCH	RAD Y

PERCENT AVAILABILITY OF ANALYTICAL RESULTS

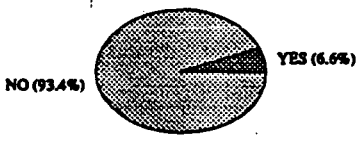
FULL HSL



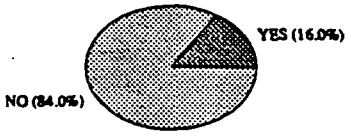
TCLP



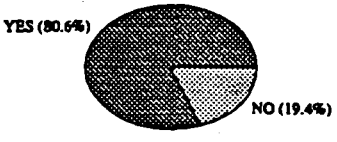
GT



GGCH



RAD



TBP

NO (100.0%) YES (0.0%)

* = GROUNDWATER SAMPLES
FHSL = FULL HAZARDOUS SUBSTANCE LIST
TCLP = TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TBP = TRIBUTYLPHOSPHATE
GT = GEOTECHNICAL
GGCH = GENERAL GROUNDWATER CHEMISTRY
RAD = RADIOLOGICAL
Y = RESULST RECEIVED AT ASI FERNALD OFFICE.

K-65 SLANT BORINGS FULL HSL RESULTS*

Data presented by location, sample number, and sample depth.
NA indicates not available. For inorganic constituents, dashes indicate concentrations below background; for organic constituents, pesticides, and PCBs, dashes indicate no detection.

SOIL SAMPLES

	BORING No.	1615	1616		1617			1618	1619
	SAMPLE No.	66957	64030	64039	66981	66990	66998	64102	64067
	ELEVATION (FT)	574.5	557.6	554	574.1	571.1	567.3	573.2	569.9
INORGANICS (MG/KG)	BACKGROUND** (MG/KG)								
Antimony	0.667	--	--	--	20.4	25.9	24.2	--	26.5
Arsenic	5.603	--	--	--	8.2	--	--	12.1	--
Cadmium	2.667	--	3.7	--	--	4.3	5.5	--	4.1
Iron	4200	--	--	--	--	--	--	32200	--
Magnesium	4652	--	23700	24800	--	33300	24100	--	31900
Manganese	276.1	746	--	415	428	342	300	684	590
Molybdenum	2.39	3.6	11.1	--	--	13.1	8	14.7	13.1
Nickel	10.014	39.3	21.3	23.2	18.6	21.6	23.7	29.7	30.6
Selenium	0.583	--	--	--	--	--	--	--	--
Silicon	NA	--	--	--	--	--	--	514	--
Silver	2.783	--	17.6	--	--	15.1	6.6	--	15.2
VOLATILE ORGANICS (UG/KG)									
2-Butanone		9	2	--	--	--	--	--	3
4-Methyl-2-pentanone		--	24	--	--	--	--	2	--
Acetone		--	24	--	--	37	--	34	--
Carbon disulfide		--	11	--	--	--	--	--	--
Chloroform		--	20	--	--	--	--	--	--
Methylene chloride		--	--	--	--	--	--	4	--
Toluene		--	--	--	--	--	--	2	--
Total xylenes		--	9	--	--	--	--	--	--
SEMIVOLATILE ORGANICS (UG/KG)									
Benzoic acid		--	84	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate		--	--	120	--	--	45	--	--
Diethylphthalate		--	--	--	--	190	--	--	--
Di-n-butyl phthalate		--	--	--	--	110	--	--	--
Phenol		--	--	--	--	--	85	--	--
PESTICIDES / PCBs (UG/KG)		--	--	--	--	--	--	--	--

*Preliminary results, not validated.
**Shacklette, H. T. and J. G. Boergen. 1984. Elemental Concentrations in Soil and Other Surfacial Materials of the Counterminous United States. U.S. Geologycal Survey Professional Paper 1270. U.S. Department of Interior.

K-65 SLANT BORINGS RADIOLOGICAL RESULTS*

Data presented by location, sample number, and sample depth.
NA indicates not available. N indicates not analyzed.
A "less than" symbol (<) before a number indicates the parameter was not present above the detection limit of the instrument.

SOIL SAMPLES

	BORING No.	1615			1616			1617		1618					1619
	SAMPLE No.	66956	66959	66968	64157	64032	64041	66974	66992	64105	64115	64125	64136	64148	64071
			66960	68969		64033	64042		66993	64106	64116	64126	64137	64149	64072
	ELEVATION (FT)	575	574	570	570.2	556.8	553.4	574.2	571.1	572.9	571.4	569.8	568.5	566.6	569.3
PARAMETERS (pCi/g)	BACKGROUND** (pCi/g)														
Actinium 227	0.11	9.66	N	N	<0.6	<0.6	<0.3	8.6	<0.26	<0.6	<0.6	0.56	1.33	<0.6	<0.6
Cesium 137	NA	N	<0.2	<0.2	N		N	N	N	N	N	N	N	N	N
Lead 210	2.38	101	N	N	34	0.56	0.46	97.9	1.03	1.06	0.73	<6.9	0.63	0.52	0.71
Neptunium 237	NA	N	<0.60	<0.60	N		N	N	N	N	N	N	N	N	N
Plutonium 238	NA	N	<0.60	<0.60	N		N	N	N	N	N	N	N	N	N
Plutonium 239/240	NA	N	<0.60	<0.60	N		N	N	N	N	N	N	N	N	N
Polonium 210	2.38	86.5	1.75	<0.6	20.9	1.74	1.23	62.6	1.27	2.06	2370	1.26	0.938	1.23	1.15
Protactinium 231	0.11	<9.4	N	N	<7.2	<1.7	<1.1	<8.7	<1.5	<2.1	<1.6	<1.8	<1.8	<1.2	<1.6
Radium 224	1.58	1.71	N	N	1.33	0.83	0.67	1.48	0.91	1.26	0.98	0.97	0.91	0.77	0.91
Radium 226	2.38	206	1.74	0.976	137	0.79	0.66	176	0.97	1.29	0.75	0.97	0.9	0.95	0.88
Radium 228	1.58	<1.5	1.22	0.803	<1.3	0.74	0.58	<1.4	0.89	1.2	0.94	0.84	0.71	0.7	0.77
Ruthenium 106	NA	N	<1.0	<1.0	N		N	N	N	N	N	N	N	N	N
Strontium 90	NA	N	<0.50	0.816	N		N	N	N	N	N	N	N	N	N
Technetium 99	NA	N	<0.90	<0.90	N		N	N	N	N	N	N	N	N	N
Thorium 228	1.58	2.06	1.91	1.21	1.72	1.28	1.47	N	1.22	1.1	1.49	1.68	1.3	1.78	1.33
Thorium 230	2.29	53.7	2.59	1.3	11.4	0.8	0.93	N	1.3	1.76	1.27	1.82	1.78	1.18	1.04
Thorium 232	1.58	1.5	0.954	0.846	1.33	0.73	<0.6	N	0.71	1.31	0.76	1.34	<1.0	0.62	1
Total Thorium (ug/g)	NA	13.6	8.61	7.64	12	6.6	4.87	N	6.42	11.8	6.81	12.1	7.22	5.58	8.98
Total Uranium (ug/g)	NA	63.7	<4.2	3.27	26.6	<4.5	<3.2	<15	54.2	4.76	10.3	79.4	110	10.7	<4.5
Uranium 234	2.29	10.6	1.48	0.875	4.17	0.8	1.3	9.68	19.3	0.97	3.59	34.6	35.9	3.58	0.89
Uranium 235/236	NA	<0.6	<0.60	<0.60	<0.6	<0.6	<0.6	0.853	1.37	<0.6	<0.6	3.17	2.92	<0.6	<0.6
Uranium 238	2.29	11.8	1.46	0.854	4.91	0.76	0.87	10.5	18.8	1.09	3.75	33.5	63.4	3.84	1.12

* Preliminary data, not validated.
**Upper Tolerance Level for background data taken from Myric et al., 1983, "Determination of Concentrations of Selected Radionuclides in Surface Soil in the U.S.," Health Physics, vol. 45, pp631-642.

K-65 SLANT BORINGS FULL HSL RESULTS.

Data presented by location, sample number, and sample depth.
NA indicates not available. For inorganic and miscellaneous constituents , dashes indicate concentrations below background; for organic constituents, pesticides, and PCBs, dashes indicate no detection.

GROUNDWATER SAMPLES

	BORING No.	1616	1619
	SAMPLE No.	64021	64090
	ELEVATION (FT)	563.8	561.2
INORGANICS (UG/L)	BACKGROUND** (UG/L)		
Aluminum	NA	74600	206
Antimony	NA	149	30
Arsenic	4	56.9	--
Barium	125	552	--
Beryllium	NA	6.4	2
Cadmium	11	11.4	--
Calcium	141000	220000	--
Chromium (Total)	35	310	--
Cobalt	NA	97.3	10
Copper	43	385	--
Cyanide	NA	NA	NA
Iron	4200	221000	7890
Lead	7	77.9	--
Magnesium	57980	83900	--
Manganese	150	6250	292
Molybdenum	20	149	20.9
Nickel	26	369	29
Selenium	2	44.6	--
Silicon	NA	79400	7260
Sodium	66180	139000	--
Vanadium	NA	203	10.1
Zinc	NA	4870	828
VOLATILE ORGANICS (UG/L)		--	--
SEMIVOLATILE ORGANICS (UG/L)		--	--
PESTICIDES / PCBs (UG/L)		--	--
MISCELLANEOUS (MG/L)			
Ammonia	0.61	--	NA
Chloride	45.57	238	NA
Fluoride	1.49	--	NA
Nitrate	0.33	55.6	NA
Phenols	NA	-	NA
Phosphorus (total)	0.16	--	NA
Sulfate	198.22	--	NA
Total Organic Carbon (TOC)	NA	3.46	NA
Total Organic Nitrogen (TON)	NA	0.327	NA

*Partial data, not validated.
** Upper Tolerance Level for glacial overburden background
Wells 1024, 1059, 1060, 1065 (Groundwater report, vol. 2, Dec. 1990).

K-65 SLANT BORINGS RADIOLOGICAL RESULTS*

Data presented by location, sample number, and sample depth.
NA indicates not available. N indicates not analyzed.
A "less than" symbol (<) before a number indicates the parameter was not present above the detection limit of the instrument.
Dashes indicate concentrations below background.

GROUNDWATER SAMPLES

	BORING No.	1616		1618	1619
	SAMPLE No.	64021	64052	64152	64090
	ELEVATION (FT)	563.9	550.9	566.4	561.2
PARAMETERS (pCi/l)	BACKGROUND** (pCi/l)				
Actinium 227	NA	<37.7	<62	<1.0	<1.0
Lead 210	NA	NA	<1.0	1.96	2.81
Polonium 210	NA	<1.6	<1.7	4.69	<1.2
Protactinium 231	NA	<69	<290	<414	<269
Radium 224	NA	<19	<20	<23	<19
Radium 226	1	--	--	2.89	--
Thorium 228	1.5	--	1.54	--	--
Total Uranium (ug/l)	4.7	439	6.17	NA	NA
Uranium 234	2	139	3.04	NA	NA
Uranium 235/236	1	9.92	--	NA	NA
Uranium 238	1.3	146	1.96	NA	NA

*Preliminary data, not validated.
**Upper Tolerance Level for glacial overburden background wells 1024, 1059, 1060, 1065 (Groundwater report, vol. 2, Dec. 1990).

K-65 VERTICAL BORINGS SAMPLES AND ANALYTICAL REQUEST LIST 2900

(CONTINUED)

01/30/92

Boring Number	Sample Number	Boring Interval (Ft)	Date Sampled	Analysis Required	RESULTS	Comments
1620	99461	4	05/15/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1620	99462	5	05/15/91	Full Rad.& Pb-210	Y	See SAP for List
1620	99462	5	05/15/91	HSL Volatile Organics	Y	Used Same Sample No. as Full Rad.
1620	99468	5	05/15/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP
1620	99469	5	05/15/91	HSL Metals	Y	None
1620	99470	5	05/15/91	HSL Cyanide	Y	None
1620	99475	5	05/15/91	HSL Mercury	Y	None
1620	99482	15	05/16/91	Full Rad. + Pb 210	N	See SAP for List
1620	99483	16	05/16/91	HSL Volatile Organics	Y	None
1620	99484	16	05/16/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1620	99488	16	05/16/91	HSL Mercury	Y	None
1620	99489	16	05/16/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP
1620	99490	16	05/16/91	HSL Metals	Y	None
1620	99491	16	05/16/91	HSL Cyanide	Y	None
1620	99493	16	05/16/91	TCLP Volatile Organics	Y	None
1620	99494	16	05/16/91	TCLP Volatile Organics	N	None
1620	99495	16	05/16/91	TCLP Semivolatiles	Y	Plus Pest/PCB
1620	99496	16	05/16/91	TCLP Semivolatiles	Y	Plus Pest/PCB
1620	99497	16	05/16/91	TCLP Metals	N	None
1620	99498	16	05/16/91	TCLP Metals	N	None
1620	99487	20	05/16/91	Full Rad. & Pb 210	N	See SAP for List
1620	99513	21	05/17/91	HSL Mercury	Y	None
1620	99514	21	05/17/91	HSL Metals	Y	None
1620	99515	21	05/17/91	HSL Cyanide	Y	None
1620	99517	21	05/17/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP
1620	99501	23	05/17/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1620	99501	23	05/17/91	HSL Volatile Organics	Y	None
1620	99500	24	05/17/91	Full Rad.	N	See SAP for List
1621	99585	*	05/23/91	Rad. ?	N	Excess Water in Sample
1621	99586	*	05/23/91	Rad. ?	N	Excess Water in Sample
1621	99530	3	05/22/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1621	99532	5	05/21/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1621	99533	5	05/21/91	HSL Volatile Organics	Y	None
1621	99540	6	05/21/91	HSL Mercury	Y	None
1621	99541	6	05/21/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP
1621	99542	6	05/21/91	HSL Metals	Y	None
1621	99543	6	05/21/91	HSL Cyanide	Y	None
1621	99557	6	05/22/91	HSL Mercury	N	None
1621	99558	6	05/22/91	HSL Semivolatiles	N	Plus Pest/PCB & TBP
1621	99559	6	05/22/91	HSL Metals	N	None
1621	99560	6	05/22/91	HSL Cyanide	N	None
1621	99562	6	05/22/91	TCLP Semivolatiles	Y	Plus Pest/PCB
1621	99563	6	05/22/91	TCLP Metals	Y	None
1621	99579	6	05/23/91	HSL Semivolatiles	N	Plus Pest/PCB
1621	99580	6	05/23/91	HSL Metals	N	None
1621	99581	6	05/23/91	HSL Cyanide	N	None
1621	99583	6	05/23/91	HSL Mercury	N	None
1621	99537	9	05/21/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1621	99549	14	05/22/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1621	99550	15	05/22/91	HSL Volatile Organics	N	None
1621	99550	15	05/22/91	TCLP Volatile Organics	N	Same Sample No. Used for HSL Volatiles
1621	99555	15	05/22/91	Full Rad.	N	Plus Pb 210-See SAP for List
1621	99554	20	05/22/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1621	99571	24	05/23/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1621	99572	25	05/23/91	HSL Volatile Organics	N	None
1621	99577	25	05/23/91	Full Rad.	N	Plus Pb 210-See SAP for List
1621	99573	26	05/22/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1621	99576	30	05/23/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1621	99578	30	05/23/91	Full Rad.	N	Plus Pb 210-See SAP for List

K-65 VERTICAL BORINGS SAMPLES AND ANALYTICAL REQUEST LIST 2900

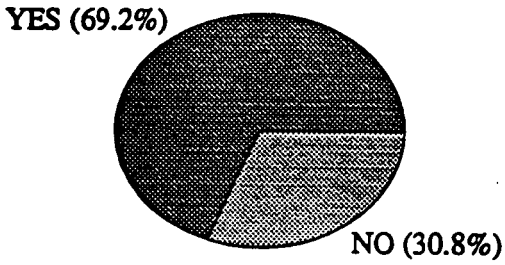
01/30/92

Boring Number	Sample Number	Boring Interval (Ft)	Date Sampled	Analysis Required	RESULTS	Comments
1622	99588	1	05/29/91	HSL Volatile Organics	Y	None
1622	99590	3	05/29/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1622	99592	5	05/29/91	Full Rad.	N	Plus Pb 210-See SAP for List
1622	99593	5	05/29/91	HSL Semivolatiles	Y	Plus Pest/PCB
1622	99594	5	05/29/91	HSL Mercury	Y	None
1622	99595	5	05/29/91	HSL Metals	Y	None
1622	99596	5	05/29/9.	HSL Cyanide	Y	None
1622	99600	13	05/30/91	TCLP Volatile Organics	Y	None
1622	99601	15	05/30/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1622	99602	15	05/30/91	HSL Volatile Organics	Y	None
1622	99603	16	05/30/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1622	99606	20	05/30/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1622	99607	20	05/30/91	HSL Mercury	Y	None
1622	99608	20	05/30/91	HSL Semivolatiles	Y	Plus Pest/PCB
1622	99609	20	05/30/91	HSL Metals	Y	None
1622	99610	20	05/30/91	HSL Cyanide	Y	None
1622	99612	20	05/30/91	TCLP Semivolatiles	Y	Plus Pest/PCB
1622	99613	20	05/30/91	TCLP Metals	Y	None
1622	99617	24	05/30/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1622	99669	24	06/05/91	HSL Metals	N	Resample for Boring No. 1622
1622	99618	25	05/31/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1622	99619	25	05/31/91	HSL Volatile Organics	Y	None
1622	99623	30	05/31/91	Full Rad.	Y	Plus Pb 210-See SAP for List
1622	99624	30	05/31/91	HSL Mercury	Y	None
1622	99625	30	05/31/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP
1622	99626	30	05/31/91	HSL Metals	Y	None
1622	99627	30	05/31/91	HSL Cyanide	Y	None
1623	99633	5	06/03/91	Full Rad.	Y	Plus Pb 210 & Pa 231-See SAP for List
1623	99634	6	06/03/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1623	99634	6	06/03/91	HSL Volatile Organics	N	None
1623	99635	6	06/03/91	HSL Mercury	N	None
1623	99636	6	06/03/91	HSL Semivolatiles	N	Plus Pest/PCB & TBP
1623	99637	6	06/03/91	HSL Metals	N	None
1623	99638	6	06/03/91	HSL Cyanide	N	None
1623	99653	14	06/04/91	Full Rad.	Y	Plus Pb 210, Ac227, Po210, Pa231-See SAP
1623	99653	14	06/04/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1623	99654	15	06/04/91	HSL Volatile Organics	Y	None
1623	99659	16	06/04/91	HSL Mercury	N	None
1623	99660	16	06/04/91	HSL Semivolatiles	N	Plus Pest/PCB & TBP
1623	99661	16	06/04/91	HSL Metals	N	None
1623	99662	16	06/04/91	HSL Cyanide	N	None
1623	99663	16	06/04/91	TCLP Semivolatiles	Y	Plus Pest/PCB & TBP
1623	99664	16	06/04/91	TCLP Metals	N	None
1623	99658	20	06/04/91	Full Rad.	Y	Plus Pb 210, Ac227, Po210, Pa231-See SAP
1623	99669	24	06/05/91	HSL Volatile Organics	Y	None
1623	99676	24	06/05/91	HSL Mercury	Y	None
1623	99676	24	06/05/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP Sample No. Used Twice
1623	99677	24	06/05/91	HSL Metals	Y	None
1623	99678	24	06/05/91	HSL Cyanide	Y	None
1623	99670	25	06/05/91	Full Rad.	Y	Plus Pb 210, Ac227, Po210, Pa231-See SAP
1623	99671	26	06/05/91	Geotechnical	N	Sent to ITAS-ETDC for Analysis
1623	99675	30	06/05/91	Full Rad.	Y	Plus Pb 210, Ac227, Po210, Pa231-See SAP
1790	99684	5	06/17/91	HSL Volatile Organics	Y	None
1790	99685	5	06/17/91	HSL Semivolatiles	Y	Plus Pest/PCB & TBP
1790	99686	5	06/17/91	HSL Metals	Y	None
1790	99687	5	06/17/91	HSL Cyanide	Y	None
1790	99688	5	06/17/91	HSL Mercury	Y	None

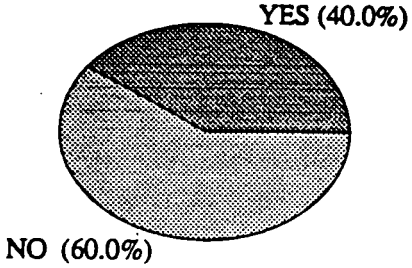
K-65 VERTICAL BORINGS

PERCENT AVAILABILITY OF ANALYTICAL RESULTS

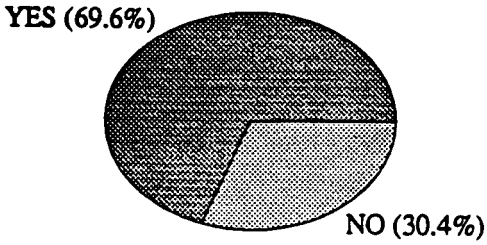
FULL HSL



TCLP



RAD



K-65 VERTICAL BORINGS HSL RESULTS*

Data presented by location, sample number, and sample depth.
NA indicates not available. For inorganic constituents, dashes indicate concentrations below background; for organic constituents dashes indicate no detection.

SOIL SAMPLES

BORING No.		1620			1621	1622			1623	1790
SAMPLE No.	Volatiles	99462	99483	99501	99533	99588	99602	99619	99669	99684
	Inorganics	99469	99490	99514	99542	99595	99609	99626	99677	99686
	Mercury	99475	99488	99513	99540	99594	99607	99624	99676	99688
	Cyanide	99470	99491	99515	99543	99596	99610	99627	99678	99687
	Semivolatiles	99468	99489	99517	99541	99593	99608	99625	99676	99685
DEPTH (ft)		5	15,16	23, 21	5, 6	1, 5	15, 20	25, 30	24	5
INTERVAL (ft)		0-10	10-20	20-30	0-10	0-10	10-20	20-30	20-30	0-10

INORGANICS (MG/KG)	BACKGROUND** (MG/KG)									
Antimony	0.667	--	27.4	22.9	27.1	19.1	--	18.6	18	20.6
Arsenic	5.603	--	7.5	7.9	6.1	--	--	8.3	--	--
Beryllium	0.98	--	--	1.1	--	--	--	--	--	--
Cadmium	2.667	4.2	5.4	4.1	--	--	7.5	--	4.4	3.2
Calcium	283514	--	--	--	4.3	--	--	--	--	--
Copper	24629	--	27	--	--	--	--	--	--	--
Cyanide	NA	--	1.6	--	0.15	0.12	1.2	--	--	--
Magnesium	4652	13900	22100	12700	16500	6390	40700	5070	20700	23900
Manganese	276.1	519	597	880	489	395	330	--	627	411
Molybdenum	2.39	3.2	4.6	3.3	3.6	2.4	--	2.9	3.3	13.3
Nickel	10.014	32.4	30.6	33.7	28.1	21.7	31.7	22.2	26.5	24.2
Silver	2.783	7.2	8.2	7	7.5	5.8	19.2	3.6	6.2	14.4

VOLATILE ORGANICS (UG/KG)									
2-Butanone	--	4	--	11	--	--	--	--	5
4-Methyl-2-pentanone	--	--	4	--	--	--	--	--	--
Acetone	16	--	--	--	--	--	--	19	--
Methylene chloride	22	--	--	--	--	--	--	4	10
Tetrachloroethene	--	--	--	--	--	--	--	7	--
Toluene	--	1	--	200	2	6	4	14	21

SEMIVOLATILE ORGANICS (UG/KG)									
bis(2-Ethylhexyl)phthalate	--	110	--	--	--	--	--	1000	--
Diethylphthalate	--	--	--	--	--	--	120	--	--
Di-n-butyl phthalate	48	--	--	--	--	--	--	--	--
Di-n-octyl phthalate	--	52	--	53	--	97	82	--	--
Phenol	--	54	--	120	110	--	--	--	--

*Preliminary data, not validated.

**Shacklette, H. T. and J. G. Boergen. 1984. Elemental Concentrations in Soil and Other Surfacial Materials of the Counterminous United States. U.S. Geologycal Survey Professional Paper 1270. U.S. Department of Interior.

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K-65 VERTICAL BORINGS RADIOLOGICAL RESULTS*

Data presented by location, sample number, and sample depth.
NA indicates not available. N indicates not analyzed.
A "less than" symbol (<) before a number indicates the parameter was not present above the detection limit of the instrument.

SOIL SAMPLES

	BORING No.	1620	1621						1622				1623				
	SAMPLE No.	99462	99532	99537	99549	99554	99571	99576	99601	99606	99618	99623	99633	99653	99658	99670	99675
	DEPTH (Ft)	5	5	9	14	20	24	30	15	20	25	30	5	14	20	25	30
PARAMETERS (pCi/g)	BACKGROUND** (pCi/G)																
Actinium 227	0.11	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Cesium 137	NA	<0.2	0.23	<0.2	<0.2	<0.2	<0.2	<0.2	N	N	N	N	N	N	N	N	N
Lead 210	2.38	1.96	4.45	1.26	0.77	0.95	0.792	8.69	0.62	0.69	1.54	417	0.98	0.84	1.16	0.89	1.31
Neptunium 237	NA	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	N	N	N	N	N	N	N	N	N
Plutonium 238	NA	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	N	N	N	N	N	N	N	N	N
Plutonium 239/240	NA	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	N	N	N	N	N	N	N	N	N
Polonium 210	2.38	4.02	14.7	2.17	1.92	1.46	32.5	0.75	1.03	1.44	1.6	943	1.68	1.42	1.2	1.43	1.58
Protactinium 231	0.11	<1.4	<1.7	<1.5	<1.5	<1.5	<1.6	<2.2	<1.3	<1.3	<1.9	25.3	<1.7	<1.7	<1.9	<1.4	<1.6
Radium 224	1.58	N	N	N	N	N	N	N	0.55	0.57	1.09	1.68	1.02	0.75	1.21	0.83	1.17
Radium 226	2.38	3.67	6.68	1.63	0.96	0.96	1.22	14.7	0.65	0.62	1.12	878	1.04	0.81	1.27	0.91	1.11
Radium 228	1.58	0.8	0.97	0.94	0.7	0.96	1.14	0.88	0.53	0.53	1.11	<2.5	0.98	0.69	1.24	0.79	0.92
Ruthenium 106	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	N	N	N	N	N	N	N	N	N
Strontium 90	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	N	N	N	N	N	N	N	N
Technetium 99	NA	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	N	N	N	N	N	N	N	N	N
Thorium 228	1.58	1.35	1.12	1.54	1.45	1.17	1.33	1.4	1.84	1.58	1.43	14.9	1.52	0.93	1.76	1.22	1.34
Thorium 230	2.29	4.01	4.78	1.71	1.33	1.28	1.32	2.79	0.95	0.9	1.01	51.2	1.69	0.74	1.47	1.58	1.46
Thorium 232	1.58	0.87	0.86	1.03	1.06	0.89	0.89	1.15	<0.6	<0.6	0.92	1.08	0.95	<0.6	1.16	0.9	0.82
Total Thorium (ug/g)	NA	7.86	7.73	9.27	9.59	8.07	8.03	10.3	<4.0	3.57	8.32	9.72	8.53	5.17	10.5	8.14	7.43
Total Uranium (ug/g)	NA	11.1	12.4	3.69	5.35	3.92	4.02	9.03	1.99	9.56	14.3	186	10.5	13.3	10.8	8.42	9.95
Uranium 234	2.29	2.59	3.62	2.28	1.44	1.39	0.99	2	0.81	1.34	1.11	24.2	1.26	1.43	1.09	1.26	2.23
Uranium 235/236	NA	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.31	<0.6	<0.6	<0.6	<0.6	<0.6
Uranium 238	2.29	3.38	4.17	2.39	1.59	1.12	1.1	2.31	0.75	1.29	1.38	24.7	1.26	1.22	1.13	1.54	2.68

* Preliminary data, not validated.
**Upper Tolerance Level for background data taken from Myric et al., 1983, "Determination of Concentrations of Selected Radionuclides in Surface Soil in the U.S.," Health Physics, vol. 45, pp631-642.

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2900

PRELIMINARY PERCHED GROUNDWATER RESULTS FROM THE ONSITE LABORATORY AS OF OCTOBER 28, 1991

Boring Number	1615	1615	1616	1616	1617	1618	1619	
Location Within Boring	57 ft.	57 ft.	48 ft.	120 ft.	68 ft.	130 ft.	110 ft.	
Parameters	Results							Units
Total Thorium	<400	<400	<400	<400	<400	<400	<400	µg/ℓ
Thorium-230	3.0	<3.0	1.0	4.5	5.0	< 10.0	2.6	pCi/ℓ
Uranium-234	0.69	0.66	96.9	1.01	3400	280	100	pCi/ℓ
Uranium-235	0.03	0.038	4.8	0.04	140.0	13	5.1	pCi/ℓ
Uranium-236	.017	0.018	0.25	0.01	<5.9	<0.54	<1.0	pCi/ℓ
Uranium-238	0.66	0.73	129.6	0.797	3100	<280	110	pCi/ℓ
Total Uranium by Laser	2.00	2.20	390	2.4	9240	840	330	ppb
Radium-226	1.00	0.9	<3.40	<4.5	<3.3	6.50	<3.40	pCi/ℓ
Lead	<6	<6	19.2	4.0	<6	<3	5.0	µg/ℓ
Barium	310	307	226.1	291.0	57	<200	<200	µg/ℓ

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EW MF		
BORING NUMBER: 1735	COORDINATES:	DATE 1/8/92	
ELEVATION: 594 ft.	GWL: Depth Date/Time	DATE STARTED: 1/8/92	
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/8/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 1 OF ~~5~~ 7	

DSO 1/21/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
		2	6	Very stiff, 10YR (3/3) Dark brown. Silty clay. Low plasticity, moist	cl	2.0	Hand Auger 6" Sample 101372 Trip blank 101373 (0930) 1/7/92 HNU=0 ppm BX=0 cpm
	101374 101375 (0805) 1/8/92	4	6	Very stiff, 10YR (3/3) Dark brown. Silty clay. Low plasticity. Moist.	cl	2.5	
1		7	0	No Recovery	NA	NA	
		8	0	No Recovery	NA	NA	
2		4	6	Very stiff. 10YR (3/3) Dark brown silty clay. Low plasticity, moist.	cl	2.25	HNU=0 ppm BX=0 cpm
		8	6	SAA	cl	3.25	

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Elay Gardner
Dan Jamison

Background
HNU=0 ppm
BX=40 cpm
Background has been 287 subtracted out.

402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EU MF		DATE 1/8/92
BORING NUMBER: 1735	COORDINATES:		DATE STARTED: 1/8/92
ELEVATION: 594ft	GWL: Depth	Date/Time	DATE COMPLETED: 1/8/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth	Date/Time	PAGE 2 OF 5
DRILLING METHODS: Hollow Stem Auger			

DOG 1/24/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
3		10	4	Very stiff. 10YR(3/3) Dark brown silty clay. Low plasticity, moist	cl	2.25	
		12	0	No Recovery	NA	NA	
4	RAD 101516 101377 (0815) 11[illegible]	4	6	Hard. 10YR(3/3) Dark brown. Silty clay. Low plasticity, moist	cl	4.0	HNU=0ppm RX=0cpm
	RAD 101578 101579 (0815) 11[illegible]	8	6	SAA, Very stiff.	cl	2.75	
5		10	0	No Recovery.	NA	NA	
		11	0	No Recovery.	NA	NA	
6							

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elay Gardner
Don Jamison

402-11-46

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF	
BORING NUMBER: 1735	COORDINATES:	DATE 1/8/92
ELEVATION: 594 ft	GWL: Depth Date/Time	DATE STARTED: 1/8/92
ENGINEER/GEOLOGIST. D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/8/92
DRILLING METHODS: Hollow Stem Auger		PAGE 3 OF 5

QC 1/21/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
6	101380 (0825) 1/8/92	6	6	Stiff. 10YR (4/6) Dark yellowish brown mottled with gray silty clay low plasticity moist.	Cl	1.75	HNU = 0ppm BX = 0cpm
		8	6	Very stiff, SAA	Cl	2.0	
7		9	6	SAA	Cl	2.25	
		11	0	No Recovery	NA	NA	
8	101381 101382 (0900) 1/8/92	Shelby	33	Stiff. 10YR (5/6) Yellowish brown. Silty clay. Low plasticity, very wet	Cl	1.25	HNU = 0ppm BX = 0cpm Shelby Pushed from 8.0 - 11.0 FT
9							

NOTES:

Drilling Contractor Pennsylvania Drilling

Drilling Equipment Bombardier Mobile Drill

Driller: Elgy Gardner
Don Jamison

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402-11-86

FERNALD
RI/FS

2900

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 9602-3.22	PROJECT NAME: Fernald RI/FS EU MF		
BORING NUMBER: 1735	COORDINATES:	DATE 1/8/92	
ELEVATION: 594 ft	GWL: Depth Date/Time	DATE STARTED: 1/8/92	
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 1/8/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 4 OF ~~5~~ 7	

DSO 1/21/92

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
9		Shelby Tube 1					
10							
RAD	101333 (0900) 1/8/92	1					
11	101384 101385 (0915) 1/8/92	3	6	Very soft. 10YR(5/4) Yellowish brown, clayey sand. Very wet	DSO 1/21/92 ~~CL~~ SC	~~2.25~~ NA	HNU=0ppm RS=0cpm
		5	6	SAA	DSO 1/21/92 SC ~~CL~~	NA ~~1.25~~	
12							

NOTES:

Drilling Contractor: Pennsylvania Drilling

Drilling Equipment: Bombardier Mobile Drill

Driller: Elgy Gardner
Don Jamison

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402-11-46

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2900

PROJECT NUMBER. 9602-3.22	PROJECT NAME. Fernald RI/FS EWMF		
BORING NUMBER: 1735	COORDINATES:	DATE 1/8/92	
ELEVATION: 594 ft	GWL: Depth Date/Time	DATE STARTED: 1/8/92	
ENGINEER/GEOLOGIST. D. O'Brian	Depth Date/Time	DATE COMPLETED: 1/8/92	
DRILLING METHODS: Hollow Stem Auger		PAGE 5 OF 57	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
12		7	6	Very soft. 10YR (5/4) Yellowish brown clayey sand. Very wet.	DSO 1/22/92 ~~CL~~ SC	~~<.25~~ NA	DSO 1/21/92
		11	6	SAA	DSO 1/22/92 ~~CL~~ SC	~~<.25~~ NA	
13				Bottom of Boring 13.0 FT			Hit perched water zone abandoned hole
14							

NOTES:
Drilling Contractor Pennsylvania Drilling
Drilling Equipment Bombadier Mobile Drill
Driller: Elay Gardner
Dan Jamison

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402-11-86

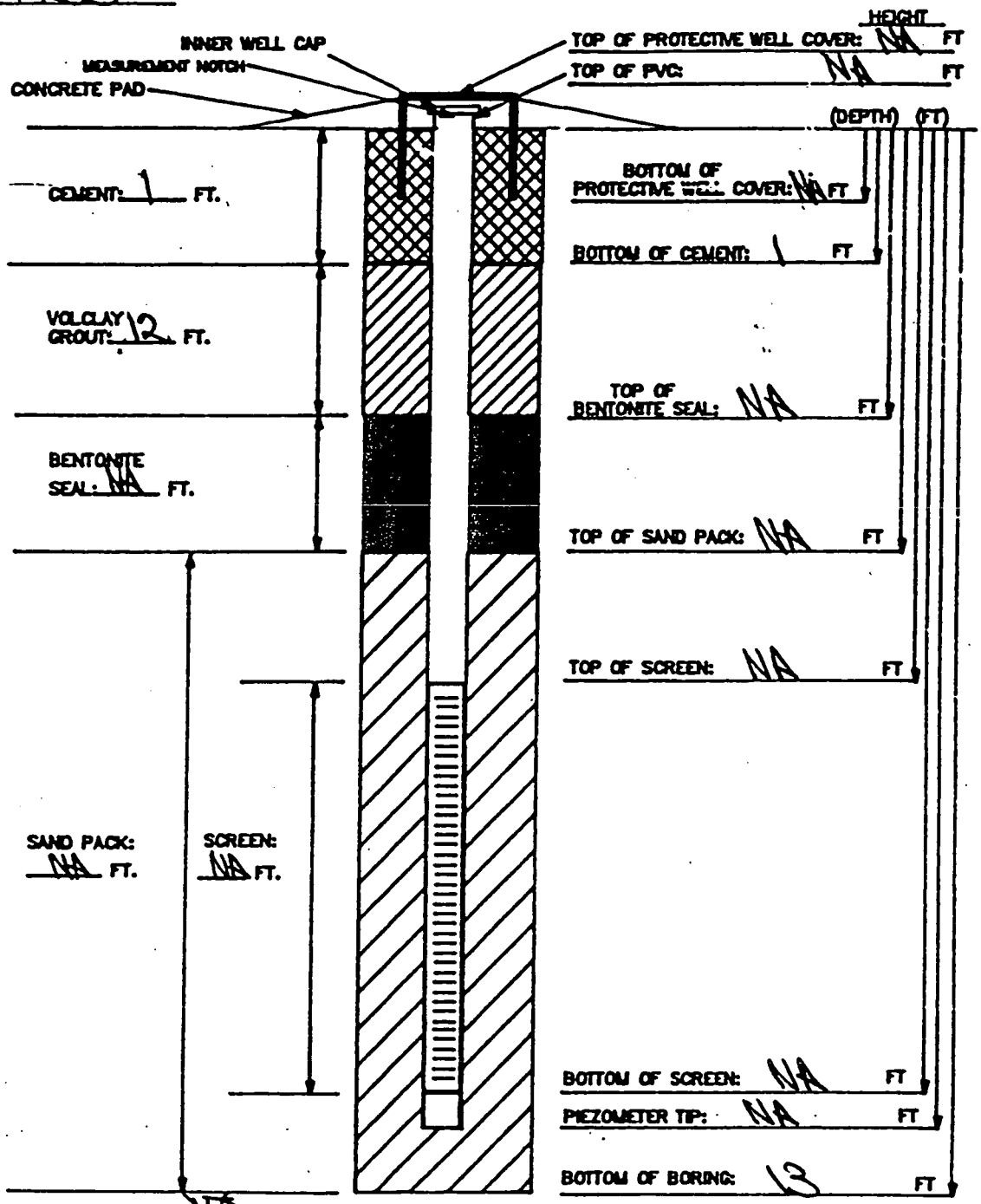
6017

2900

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. 1735

INSTALLATION DATE: 1/8/92



BOREHOLE DIAMETER: 10 INCHES

MATERIALS USED:
SAND TYPE AND QUANTITY:
BENTONITE PELLETS (5-GALLON BUCKETS):
BAGS OF VOLCLAY GROUT: 1 bag
AMOUNT OF CEMENT: 1/2 bag
AMOUNT OF WATER USED:
OTHER: NA

NOTES:
1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: NA
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

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TASK: 3.22 GEOLOGIST/ENGINEER: D. O'Brien

FERNALD
RI/FS

7917900

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FLUME FIELD ENG./GEO. D. O'Brien DATE 1/8/92
PROJECT NO. 9602-3.22 CHECKED BY C Grube DATE 01/16/92
BORING NO. 1735
PIEZOMETER NO. NA DATE OF INSTALLATION 1/8/92

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Augers	TYPE OF BIT NA
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA FROM NA TO NA	SIZE NA FROM NA TO NA
FLUID NA FROM NA TO NA	SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1.0	BOTTOM 13.0	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	13.0			
GWL AFTER INSTALLATION	NA			

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

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REMARKS 0.0-1.0 ft. cement cap

409-11-86