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REMOVAL ACTION NO. 31 - SEEPAGE CONTROL AT THE SOUTH FIELD AND INACTIVE FLYASH PILE - JANUARY 1995

01/20/95

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DOE-FN EPAS
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WORK PLAN

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

WORK PLAN

REMOVAL ACTION NO. 31: SEEPAGE CONTROL AT THE SOUTH FIELD AND INACTIVE FLYASH PILE

JANUARY, 1995

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

000001

Department of Energy
Fernald Environmental Management Project
P. O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 648-3155

JAN 20 1995

DOE-0462-95

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V-5HRE-8J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
401 E. Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF WORK PLAN FOR REMOVAL ACTION 31

The Department of Energy, Fernald Area Office (DOE-FN) is pleased to submit for your review the enclosed Work Plan for Removal Action Number 31, Seepage Control at the Southfield and Inactive Flyash Pile.

Please note that this Removal Action includes the excavation of approximately 900 cubic yards of contaminated material and the placement of that material in an existing soil stockpile. While this proposed disposition would preclude the need for construction of a separate Operable Unit 2 (OU2) stockpile, it would deviate from Removal Action No. 17 by crossing operable unit boundaries with soil. Hence, U.S. Environmental Protection Agency (U.S.EPA) approval of this Work Plan is requested prior to the commencement of field activities.

If you have any questions, please contact Rod Warner at (513) 648-3156.

Sincerely,

Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Jalovec

Enclosure: As Stated

Recycled and Recyclable

cc w/encs:

G. Jablonowski, USEPA-V
M. Proffitt, OEPA-Dayton
J. Michaels, PRC
L. August, Geotrans
T. Hagen, FERMCO
R. George, FERMCO
H. Hume, Parsons
A/R Coordinator

cc w/o encs:

M. McCune, EM-424/QO
J. Jalovec, DOE-FN
R. Warner, DOE-FN
G. Jones, FERMCO
U. Kumthekar, FERMCO
N. Weatherup, FERMCO
M. Yates, FERMCO
G. Mitchell, OEPA-Dayton
G. Becker, Radian

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

WORK PLAN

REMOVAL ACTION NO. 31: SEEPAGE CONTROL AT THE SOUTH FIELD AND INACTIVE FLYASH PILE

DRAFT

January 1995

Prepared by

Fernald Environmental Restoration Management Corporation

Removal Action No. 31: Seepage Control at the South Field and Inactive Flyash Pile

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Acronyms and Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirement
DOE	United States Department of Energy
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Company
GMA	Great Miami Aquifer
IFP	Inactive Flyash Pile
QA	Quality Assurance
RA 31	Removal Action Number 31
RSE	Removal Site Evaluation
SF	South Field

EXECUTIVE SUMMARY

The goal of Removal Action No. 31 is to reduce impacts on the Great Miami Aquifer (GMA) from contaminated seepage from the South Field (SF) and Inactive Flyash Pile (IFP) and infiltration through the sediment at the southeast corner of the SF. This project has been proposed in response to the Removal Site Evaluation (RSE) of Seepage at the SF and IFP and the subsequent action memorandum issued by the United States Department of Energy (Letter DOE-0069-95, 25 October 1994).

The SF and IFP are located southwest of the former Production Area. In the past, these units were used as disposal areas for nonprocess wastes including boiler plant ash and construction debris. Much of the material in these units is contaminated with low concentrations of uranium. Water seeping through the disposed material, into the ditches along the northern and eastern edges of the SF and the western edge of the IFP, has been observed to have uranium concentrations ranging from 23 to 910 μg/L. Water entering the ditches can travel rapidly downstream to areas where the GMA outcrops - areas above and upgradient of regions of the GMA with elevated concentrations of uranium in groundwater. Sediment in the ditches and in the southeast corner of the SF have been found to have uranium concentrations ranging from 15 to 30 μg/g. Runoff, which drains to the southeast corner of the SF, infiltrates through the contaminated sediment and enters the GMA.

This work plan presents a time-critical removal action with the following goals:

- To collect contaminated seepage in the drainage ditches along the SF and the IFP and pump that seepage, together with runoff from the initial portion of storm events, to the Advanced Wastewater Treatment (AWWT) facility

- To remove contaminated sediment from the southeast corner of the SF so that infiltration through that sediment will not contribute to contamination of the GMA

The seepage collection system would include a weir/sump with water level activated pump located in the drainage ditch at each subunit. The seepage and surface runoff collected in the sump would be pumped to the AWWT Facility. The pump would be controlled by the water level in the sump. During rainfall events that produce flow rates greater than that which can be handled by the sump pump, the initial, more contaminated portion would be captured; however, the large portion of less contaminated runoff would spill over the weir and drain downstream. Sediment would be trapped in the sump and routinely removed. This solution also includes removal of contaminated sediment in the flat area in the southeast corner of the SF to prevent leaching of contaminants into the GMA. The sediment removed from the SF and source material excavated from the installation of the seepage collection system would be disposed by transporting to an existing controlled stockpile.

1.0 INTRODUCTION

1.1 PURPOSE

This removal action work plan documents the proposed activities under Removal Action No. 31 (RA 31), Seepage Control at the South Field (SF) and Inactive Flyash Pile (IFP). The goal of RA 31 is to reduce impacts on the Great Miami Aquifer (GMA) from contaminated seepage in the SF and IFP and infiltration through sediment at the southeast corner of the SF. This project has been proposed in response to the Removal Site Evaluation (RSE) of Seepage at the SF and IFP and the subsequent action memorandum from the United States Department of Energy (DOE) (Letter DOE-0069-95, 25 October 1994). Copies of those documents are presented in Attachments A and B, respectively.

1.2 STRUCTURE

This removal action work plan is structured as follows:

- Section 2.0 provides background information about the Removal Action. This includes a description of the project area, summary of the potential threat, explanation of the proposed removal action, and a discussion of integration with remediation activities.
- Section 3.0 presents the project organization. This identifies individuals and groups responsible for the various aspects of implementation of the removal action.
- Section 4.0 presents the project schedule.
- Section 5.0 details RA 31 field activities.
- Section 6.0 presents an overview of the health and safety program.
- Section 7.0 presents an overview of the quality assurance program.
- Section 8.0 provides a discussion of applicable or relevant and appropriate requirements, as well as to-be-considered criteria.
- Section 90 examines environmental impacts..

2.0 BACKGROUND

2.1 DESCRIPTION OF PROJECT AREA

The SF and IFP are subunits within Operable Unit 2 (OU2) at the Fernald Environmental Management Project (FEMP) and are located about 2000 feet southwest of the former Production Area as shown in Figure 2-1. The SF and the IFP are contiguous and there is no defined physical boundary between the two subunits.

2.1.1 South Field

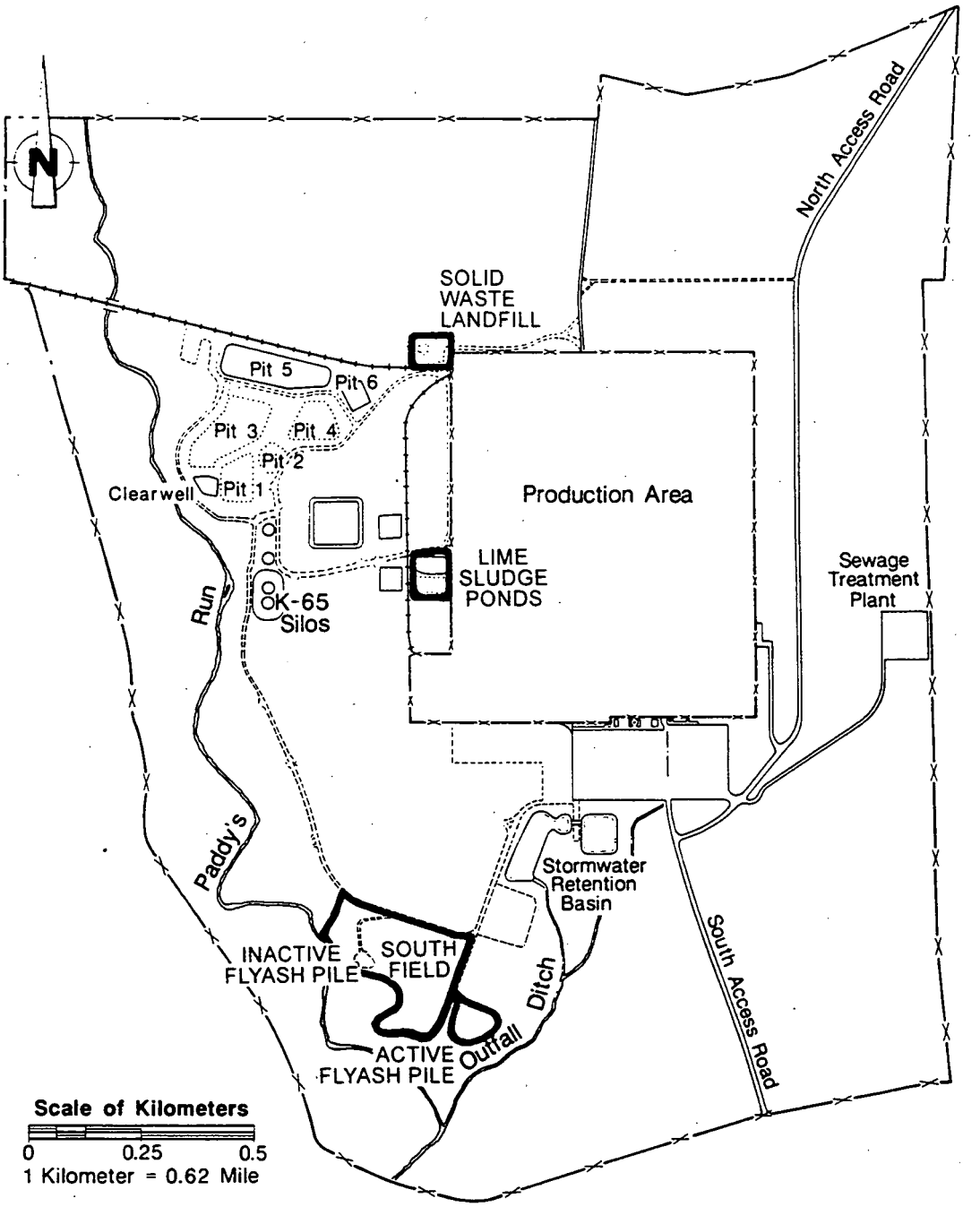
The SF is located between the IFP and the Active Flyash Pile and covers an area of approximately 11 acres. It is bounded by the IFP on the west, and by gravel roads on all other sides. Currently, the SF is relatively flat except along its winding southern boundary where it slopes sharply downward toward the gravel road. The SF is covered with grasses, shrubs, and trees.

The SF was not an engineered disposal facility; its operational history is neither well documented nor well understood. As noted in the OU2 Remedial Investigation report (RI), disposal may have been initiated in 1954 and continued until the mid-1960s. Disposal appears to have taken place in a random manner. The SF was reportedly used as a burial site for FEMP nonprocess wastes such as flyash, on-site construction/demolition rubble, and soils that may have contained low levels of radioactivity.

2.1.2 Inactive Flyash Pile

The IFP is located immediately west of the SF and covers an area of approximately 3 acres. Paddys Run and a tributary drainage ditch form the western boundary; a gravel road runs along the north; and the SF forms the eastern boundary. In appearance, the IFP resembles a relatively steep hill covered with shrubs and trees. The soil covering the southern half of the IFP is of unknown origin.

Like the SF, the operational history of the IFP is not well understood. Much of the waste material in the pile is reported to be bottom ash and flyash from the facility's boiler plant operations, but approximately 40% of the pile is soil. As reported in the OU2 RI, the ash appears to have been taken by truck to an existing slope near Paddys Run and dumped. Ash disposal at this subunit appears to have ceased by the mid-1960s. Various other wastes, including building rubble, gravel, asphalt, and process waste, were also deposited at the IFP.



LEGEND

- Location of Operable Unit 2 Subunits
- Covered Pit
- Fence
- Railroad Spur
- Roadway

Figure 2-1:FEMP Site Map

GRAPHICS #2617

2.2 SUMMARY OF THE POTENTIAL THREAT

The OU2 RI (DOE, November 1994) identified water seeping from fill material at the SF and IFP into the perimeter drainage ditches at these subunits. As discussed in the RSE (See Attachment A), total uranium concentrations in surface water near the seeps range from 110 to 540 μg/L at the SF and from 23 to 910 μg/L at the IFP. As water travels downstream in these perimeter ditches, it enters areas where the sands of the GMA outcrop. Samples from the sediment in the SF and IFP drainage ditches indicate that typical concentrations of uranium range from 15 to 30 ug/g in the SF and from 5 to 12.3 ug/g in the IFP. Uranium concentrations in groundwater downgradient of the GMA outcropping are greater than 300 ug/L in the SF and 1800 ug/L in the IFP. The drinking water standard for concentrations of uranium is 20 ppb. The analytical data suggests that the seeps from the IFP and SF are contributing to total uranium contamination in the GMA that exceeds the regulatory limit for drinking water. The impact to groundwater is one to two orders of magnitude above the drinking water standard. The range of detected concentrations of total uranium in the IFP and SF wastes is 1.05 to 3,580 ug/g. The large volume of waste and the high concentrations of uranium indicate that the release of uranium through seepage and contaminated sediments could continue at the present concentration until the subunits are remediated.

In accordance with Section 40 CFR 300.415 (b) (2), the applicable factors for determining the appropriateness of a removal action to address this potential threat are presented in the table below.

Factor	Explanation
Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants	The contaminated seepage drains into Paddys Run and areas that recharge the GMA. This results in the potential for human consumption of the groundwater as well as direct contact by wildlife.
Actual or potential contamination of drinking water supplies or sensitive ecosystems	The contaminated seepage drains to areas that recharge the GMA.
Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released	Wet weather leads to the development of the seepage.

2.3 PROPOSED REMOVAL ACTION

As identified in the RSE (Attachment A) and the Evaluation of Alternatives (Attachment C), RA 31 will address the following two mechanisms by which contamination is transported along the eastern edge of the SF and the western edge of the IFP:

- Contaminated seepage flows from the materials at the SF and IFP, enters the perimeter ditches, and infiltrates into the GMA at locations where the aquifer sands outcrop. The sands are exposed both in the lower portions of the ditches themselves and in a flat area at the southeast corner of the SF. During dry periods, concentrations of contaminants in water in the drainage ditches are higher due to lack of dilution when the seepage enters the ditches. In contrast, seepage during wet periods is diluted by relatively clean surface runoff. The goal of RA 31 is to capture the seepage in its more contaminated state.

- Runoff infiltrates through contaminated sediments in the southeast corner of the SF, leaches uranium from that sediment, and then enters the GMA. There is some opportunity for sediments to continue to be carried from the northern portions of the SF down the perimeter drainage ditch and be deposited in the southeast corner. Hence, the goal of RA 31 is to address infiltration through the sediment in the southeast corner of the SF and to minimize the potential that future sediment transport in the SF drainage ditch would deposit contaminated sediment in the southeast corner of the SF.

Figure 2-2 presents a plan view of the SF/IFP area and shows the locations of the drainage ditches and seeps at the subunits, as well as the location where sediments can contribute to contamination of the GMA.

The proposed solution is to install a seepage collection system and remove the contaminated sediment. A seepage collection system would collect contaminated seepage entering into the existing drainage ditches. A conceptual layout of the seepage collection system is shown on Figure 2-3. The seepage collection system would include a weir/sump with a single water level activated pump located in the drainage ditch at the SF and a similar unit in the drainage ditch at the IFP. The seepage and surface runoff collected in each sump would be pumped to the AWWT Facility. The pump in each sump would be controlled by the water level in the sump. Each pump would be activated by a high level control and deactivated by a low level control.

During rainfall events that produce flow rates greater than that which can be handled by the sump pump, runoff would spill over the weir and drain downstream. As mentioned in the Evaluation of Alternatives (Attachment C), this overflow is a disadvantage of the proposed system. However, the initial runoff from storm events would be captured; thus, seepage initially washed into the sump would receive treatment and any contamination in the overflow would be diluted. Hence, this overflow was considered only a minor disadvantage and was offset by the fact that a sump would disturb a much smaller area than a system to intercept seepage before it enters the ditches. Also, by locating the sumps in the drainage ditches, contaminated sediments would also be captured rather than being washed downstream and deposited above the GMA. The sumps will be inspected on a regular basis. If sediment is found at unacceptable volumes in the sumps, it will be removed and placed on a controlled

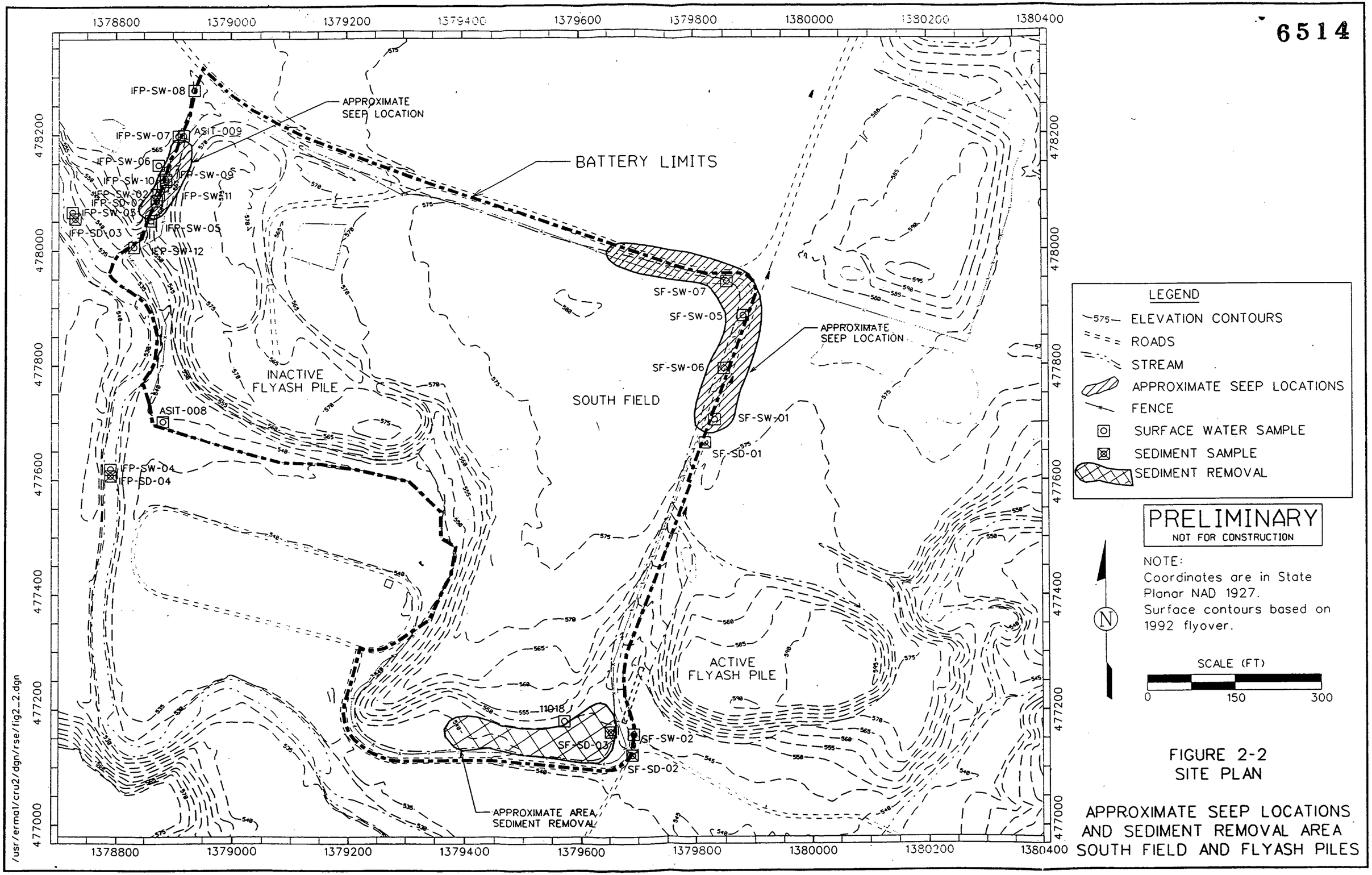


FIGURE 2-2
SITE PLAN

APPROXIMATE SEEP LOCATIONS AND SEDIMENT REMOVAL AREA SOUTH FIELD AND FLYASH PILES

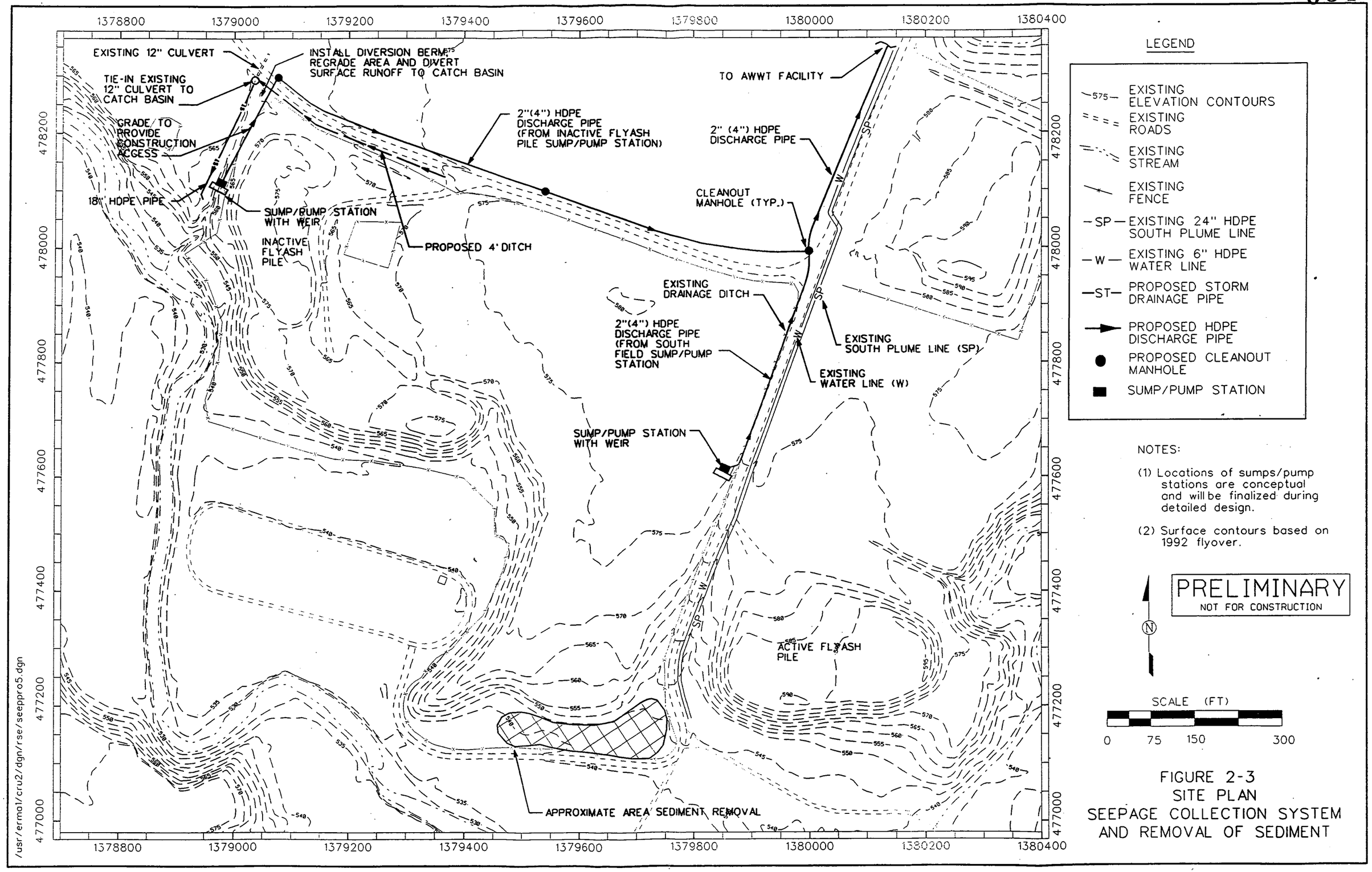


FIGURE 2-3
SITE PLAN
SEEPAGE COLLECTION SYSTEM
AND REMOVAL OF SEDIMENT

soil stockpile.

In order to minimize overflow of the sump in the IFP drainage ditch, flow entering the north end of the ditch (upstream of the seeps) will be routed around the sump. The water will reenter the drainage ditch just south of the sump location.

The design of each sump and associated pump will be based on the following goals:

- Ensure sufficient capacity and pumping rate to capture seepage flow
- Capture the initial flush flow from storm events
- Ensure acceptable pump cycle time

Because the flow from the seeps is estimated at 0.35 and 0.26 gpm form the IFP and SF, respectively (based on the Operable Unit 2 Remedial Investigation Report), the first criterion will not be a limiting factor. The volume necessary to capture flush flow is estimated to be several hundred gallons, but that quantity will be verified during detailed design.
This removal action also includes removal of contaminated sediment in the flat area in the southeast corner of the SF to prevent leaching of contaminants into the GMA. The sediment removed from the SF and soil/debris excavated during the installation of the collection system would be disposed in controlled stockpile as described in Section 5.3 of this Work Plan. "The estimated volume of sediment to be excavated and disposed is 900 cubic yards."

"The excavation in the southeast corner of the South Field will remove the surface sediment that is thought to have been deposited due to the erosion of material that was disposed in the South Field. It may be difficult during field observation of the excavation to identify the extent of that sediment. Hence, this removal action will be limited to excavation of no more than 18 inches in the depth and the areal extent shown on Figure 2-3. this is a practical limitation that provides some schedule and budgetary controls on the project while ensuring that the overall extent of contamination is reduced. While a more extensive removal could have been proposed, it is more properly the purpose of remediation to provide a final solution for the South Field."

All excavation and construction activities associated with RA 31 will be performed above the ordinary high water level mark of Paddy's Run Creek (i.e., 533 ft MSL). Appropriate erosion control will be used to mitigate the transport of erodible material during runoff events.

"The quantities and dimensions noted in the text and on the drawings are estimates that will be revised during detailed design of the sumps/pump stations and pipeline."

2.4 INTEGRATION WITH REMEDIATION ACTIVITIES

The OU2 remedial action is currently scheduled to begin in 1997. The activities that take place under RA 31 will reduce the amount of contamination entering the groundwater during the time prior to full implementation of that remedial action. Certain facilities constructed under RA 31 will be useful during the remediation. Those facilities include the electrical powerline and the double-walled pipeline discharging to the AWWT facility.

3.0 PROJECT ORGANIZATION

3.1 PARTICIPANTS

The major participants in RA 31 will be the lead federal agency, the managing and operating contractor, the design engineer, and the construction organization. The DOE is the lead federal agency. Fernald Environmental Restoration Management Company (FERMCO) is the environmental restoration management contractor. Design and technical support will be performed by a subcontracted architecture-engineering firm (A-E). Construction will be managed by FERMCO.

3.2 RESPONSIBILITIES

The DOE has overall responsibility for coordination and execution of the removal action.

FERMCO is responsible for implementation of the removal action in a manner consistent with DOE and regulatory guidance. FERMCO will perform the following items:

- Preparation of a request for proposal for design and technical support
- Development of Applicable or Relevant and Appropriate Requirements (ARARs)
- Preparation of a Project Health and Safety Plan
- Preparation of a construction cost estimate
- Requisition of materials
- Construction management
- Operation and maintenance
- Resolution of NEPA/Cultural Resource requirements
- Assure that cost, schedule, and scope requirements are met.
- Assure continuity in performance and information exchange among the project participants.

Following completion of construction, the Utilities Engineering Department within FERMCO's Remedial Support Operations will be responsible for startup of the collection system, continued operation, and routine maintenance.

The A-E has multiple responsibilities as follows:

- Preparation of Certified for Construction (CFC) Documents (Title I and II design services, including an Erosion and Sediment Control Plan)
- Preparation of the Start-Up Plan and support during start-up of the seepage collection system
- Preparation of the Operation and Maintenance (O & M) Plan for the seepage collection system
- Support services during construction
- "Preparation of "As-Built" Documents

The construction subcontractor will be responsible for construction of the RA 31 facilities. This will include the following:

- Site preparation
- Excavation of sediment from the southeast corner of the SF and soil/debris during installation of the sumps/pump stations
- Installation of sumps/pump stations
- Installation of the pipeline from the pumps to the AWWT
- Providing electrical power to the pumps
- Restoration of disturbed areas
- "As-built" survey and redlining of drawings

3.3 PROJECT MANAGEMENT

The current project team for RA 31 is presented in the table below.

Project Team	Name	Phone
DOE Contact	Jay Jalovec	648-3122
Project Manager	Greg Jones	738-6133
Lead Engineer	Uday Kumthekar	738-6841
Health & Safety	Mike Davis	738-6492
Construction	Warren Hooper	738-6496
Remedial Support Operations	Jim Leslie	738-6658

4.0 SCHEDULE

A schedule for the major milestones related to Removal Action 30 is presented in the table below. A barchart schedule for project activities is presented in Attachment D.

Major Milestone	Date
RSE Submitted to DOE	11 October 1994
Action Memorandum from DOE to FERMCO	26 October 1994
Work Plan to EPA	20 January 1995
A-E Starts Detailed Design	27 January 1995
EPA Review and Comments	22 February 1995
A-E submits CFC documents, Startup Plan, and O&M Plan	31 March 1995
Start Construction	25 April 1995
Completion of Sediment Removal	31 July 1995
Completion of Seepage Collection System	4 August 1995
Submittal of Final Removal Action Report to DOE	26 October 1995
Operation & Maintenance	From August 1995 to Completion of Remediation at SF and IFP

5.0 FIELD ACTIVITIES

5.1 CONSTRUCTION

Under RA 31, construction activities will consist of six major activities - site preparation, rerouting drainage around the IFP drainage ditch, installation of the sumps/pump stations, installation of the pipeline from the pumps to the AWWT, providing electrical power to the pumps, excavation of sediment from the southeast corner of the SF.

Construction activities will begin with site preparation. This includes the set up of necessary construction facilities such as construction fencing, the laydown area, the storage area, the decontamination area, and erosion control measures. Access will then be constructed to the location for the IFP pump station and the SF sediment removal area. "Two support areas and one lay-down area are expected to be used. One support area will be immediately east of the South Field. The other will be north of the IFP or adjacent to the drainage ditch at the IFP. The lay-down area will be adjacent to one of the support areas, but the choice of location will be finalized as the design is completed." "Erosion control measures will comply with the Erosion and Sediment Control Plan to be prepared by the A-E. Those measures will ensure routing of stormwater runon away from the construction activities including excavation, trenching, and backfill and will utilize straw bales and silt fences as appropriate to control erosion and sediment."

To reduce the flow in the western perimeter drainage ditch at the IFP in the region where the seeps are located, water entering the north end of the ditch will be routed around a portion of the ditch. This will be done by installing a catch basin at the outfall of the 12 inch culvert at the gravel road north of the IFP and an 18 inch storm drainage pipe from the catch basin to a downstream location in the IFP perimeter drainage ditch just south of the sump location. This will reroute runoff entering the 12 inch diameter culvert (all runoff from the area north of the SF/IFP which would otherwise enter the perimeter drainage ditch) plus runoff from the northern portion of the IFP.

Installation of each of the sumps/pump stations will include the site preparation activities mentioned above plus the following activities:

- Temporary diversion of flow in the drainage ditch
- Excavation
- Installation of the pump station and weir
- Backfill around the pump station and revegetation

- Power tie-in
- Start-up of the pump

Installation of the pipeline from the pump stations to the AWWT facility will include site preparation plus the following:

- Trench excavation
- Installation of High Density Polyethylene (HDPE) pipelines (2-inch carrier pipe inside and 4-inch container pipe) and cleanout manholes
- Installation of a check valve in the 8-inch line at the AWWT facility
- Connection to 8-inch line at the AWWT facility
- Pressure testing
- Backfilling and revegetation

Electrical power will be provided via overhead lines to each of the pump stations. Electrical tie-ins will be made at the existing power source in the vicinity of the storm water retention basin and each of the pumps. Lighting will be provided at each pump station.

The sediment in the southeast corner of the SF will be excavated using conventional construction equipment. The depth of excavation will be as directed by the project engineer based on the visual extent of sediments in the area. The excavation will not exceed 18 inches in depth. Excavated sediment will be placed in trucks and hauled to a controlled stockpile.

5.2 STARTUP/OPERATIONS & MAINTENANCE

Startup, operation, and maintenance activities will address the two pump stations, the pipeline to the AWWT facility, and associated controls. Maintenance of the pump stations will include periodic removal of sediment from the sumps. Maintenance will also include periodic inspection and maintenance of the overhead power lines from the on-site power source to the pump stations.

5.3 WASTE MANAGEMENT

Excess materials generated by this project could be of five general types - excess soil from excavations, debris from excavations, excess construction material and construction wastes,

debris from clearing and grubbing, and disposable PPE. The proposed disposition of these materials is as follows:

Excess Soil. Excess soil includes sediment excavated from the southeast corner of the SF plus any excavated soils remaining after installation of the sumps/pump stations, pipelines, and manholes, and associated grading operations. As noted in Section 2, the uranium content of this excess soil ranges from about 15 to 30 ug/g. This soil will be disposed in a controlled stockpile.

The stockpile proposed to receive this material, currently estimated as 900 cubic yards, is the Operable Unit 5 Category I stockpile immediately south of the Storm Water Retention Basins. Category I encompasses material that does not contain hazardous components and does not exceed the radiological parameters of 100 pCi/g uranium, 50 pCi/g thorium, and 5 pCi/g radium. Placement of the Operable Unit 2 material within an Operable Unit 5 stockpile is a deviation from procedures currently presented in the Removal Action 17 work plan, which states that "Each OU will establish a controlled stockpile." At this point in the ongoing cleanup of the FEMP, such an exception to Removal Action 17 is acceptable for the following reasons:

- The FEMP is well into the RI/FS process. Radiologically-based cleanup levels that have been identified for soils within the OU2 and OU5 feasibility studies are frequently below the Category I cutoffs. Hence, any soil in such a stockpile cannot be considered to be acceptable to be left in place unless it has been characterized to have radiological levels below the proposed cleanup levels. Therefore, placement of the OU2 material in the proposed location will not jeopardize any future disposition options for the material in that stockpile.

- The potential concerns about mixing wastes from different OUs, which led to the statement quoted above, no longer apply because the proposed remediation of Category I soils is consistent between OUs 2 and 5 (i.e., disposal in an on-site disposal facility).

The FEMP is currently reviewing the categorization of soil under Removal Action 17, including the stockpile south of the SWRBs. In the event that the categorization system is refined and the excess soil from OU2 cannot be deposited at the proposed stockpile, one of the other Category I stockpiles on site will be utilized.

Debris from Excavations. Debris from excavations would include any non-soil material excavated during installation of the sumps/pump stations, pipelines, and manholes. Based on the proposed locations of the excavations for this project (all of which are in areas of shallow fill), none of this type of material is anticipated. If

encountered, an attempt will first be made to modify construction needs to allow the debris to be left in place. If this is not possible, it will be placed in boxes and stored per existing site procedures.

Excess Construction Material/Construction Wastes. This category includes leftover pipe, rip-rap, etc. that are usable construction materials, but might have been procured in excess of the actual needs of the project. This category also includes equipment maintenance supplies (e.g. used oil filters) and unusable debris brought in specifically for this project (e.g. packing crates, materials damaged during construction). Such materials will be handled in one of three ways. When leftover construction material is obviously useful for future construction activities at the site (e.g. rip-rap) or maintenance activities, it would be stockpiled on site until needed. If the material/waste is not potentially useful for maintenance or other projects, it would be screened per site procedures. If not contaminated, it would be if disposed at a local solid waste landfill off site. If contaminated, it would be containerized and handled with other such waste generated at the FEMP.

Debris from Clearing and Grubbing. This debris consists of trees and shrubs that were removed during site preparation activities. These trees and shrubs would be placed in a pile within the controlled area of the SF.

Disposable PPE. The category includes any personal protective equipment that cannot be recycled or reconditioned, but must be disposed after use. These materials would be containerized and handled with other such waste generated at the FEMP. When such waste is not contaminated, it is disposed at a local solid waste landfill off site.

5.4 RADIOLOGICAL CONTROL

During field activities discussed in the above subsections, radiological control activities will be performed in accordance with the Project Specific Health and Safety Plan (see Section 6.0 and Attachment E).

Equipment decontamination will be performed whenever equipment is being removed from the work area and radiological control technicians determine that decontamination of that equipment is required. Equipment will be decontaminated based on criteria established in the DOE Radiological Control Manual (DOE\EH-0256T). Table 2-2 of that document presents the following limits:

- 1,000 dpm/100 cm^2 for removable contamination

- 5,000 dpm/100 cm^2 total for fixed and removable contamination as an average across any square meter area

- 15,000 dpm/100 cm^2 maximum for total fixed and removable contamination

Based on past experience in the project areas, these limits should allow equipment to be decontaminated at the project site without washing the equipment. If washing is required, measures will be taken to collect and dispose of the wash water. Any more extreme decontamination needs will be addressed by transporting the contaminated equipment to the specialized decontamination facilities within the FEMP former production area."

6.0 HEALTH AND SAFETY

This removal action will be performed in accordance with the FEMP site-wide health and safety program and the Project Specific Health and Safety Plan. A copy of the Project Specific Health and Safety Plan is provided in Attachment E of this Work Plan. That plan identifies, evaluates, and controls safety and health hazards. The plan is consistent with 29 CFR 1910.120 and the FEMP Site HASP.

7.0 QUALITY ASSURANCE

In compliance with 10 CFR 830.120, the implementation of Removal Action 30 will be governed by RM-0012, "Quality Assurance Program," Revision 3, Effective Date November 30, 1994.

The Quality Assurance Program (QAP) establishes the quality assurance requirements for FERMCO and all other contractor and subcontractor organizations performing work at the FEMP. The QAP contains ten quality assurance criteria that provide the basic requirements of a quality assurance program. The following is a description of the ten criteria identified in the QAP:

- The **Program Criterion** describes the requirements and responsibilities for an organization to develop and maintain an effective management system to assure the adequacy of work.

- The **Personnel Training and Qualification Criterion** establishes the requirements that ensure all personnel are capable of performing their assigned tasks and that job proficiencies are maintained.

- The **Quality Improvement Criterion** establishes and implements processes to detect, control, correct, and prevent quality problems and to promote quality improvement.

- The **Documents and Records Criterion** establishes and implements a system for the control of documents and the handling, collection, storage, and control of records generated at the FEMP.

- The **Work Processes Criterion** control all standard and special activities to ensure that they are accomplished under controlled conditions.

- The **Design Criterion** implements processes to control formal design activities and ensure that design work is based on sound engineering/scientific principles and appropriate standards.

- The **Procurement Criterion** establishes the requirements for preparing, reviewing, and controlling procurement documents and for controlling purchased materials, equipment, and services.

- The **Inspection and Acceptance Testing Criterion** establishes the performance standards and required calibration and maintenance of equipment used for inspections and tests.

- The **Management Assessment Criterion** evaluates the adequacy and effectiveness of the quality assurance program in providing the framework for FERMCO's achieving it's mission and objectives.

- The **Independent Assessment Criterion** establishes the requirements for the implementation of an independent assessment program.

8.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

In accordance with Section 300.415(i) of the National Contingency Plan (NCP), on-site removal actions conducted under CERCLA are required to attain ARARs to the extent practicable. This section discusses the ARARs for Removal Action No. 31.

ARARs are defined as follows:

- Applicable requirements are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

- Relevant and appropriate requirements are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

- To Be Considered (TBC) criteria is a category that includes non-promulgated criteria, advisories, and guidance issued by federal or state government that are not legally binding and do not have the status of potential ARARs. However, pertinent TBCs will be considered along with the ARARs in determining the necessary level of cleanup or technology requirements.

The NCP identifies three categories of ARARs [40 CFR §300.400(g)]:

- Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies used to determine acceptable concentrations of chemicals that may be found in or discharged to the environment [e.g., maximum contaminant levels (MCLs) that establish safe levels in drinking water].

- Action-specific ARARs are usually technology- or activity-based requirements, limitations on actions, or conditions involving special substances.

- Location-specific ARARs restrict actions or contaminant concentrations in certain environmentally sensitive areas. Areas regulated under various federal laws include floodplains, wetlands, and locations where endangered species or historically significant cultural resources are present.

The ARARs for Removal Action No. 31 are listed in Attachment G. A discussion of these ARARs is presented in this section.

8.1 CHEMICAL-SPECIFIC ARARS/TBCS

Protection of the public from radiation exposure and control of radioactive air emissions are the two categories of chemical-specific requirements for Removal Action No. 31. DOE Orders 5820.2A and 5400.5, which are both TBCs, have established dose limits for the public:

- concentrations of radioactive material which may be released to the environment must not result in an effective dose equivalent that exceeds 25 mrems per year to any member of the public; and

- exposure to members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem.

EPA has established applicable and relevant and appropriate standards for radionuclide air emissions. Emissions of radon-222 must not exceed an average release rate of 20 pCi/m^{2}s or increase the average concentration by more than 0.5 pCi/L. Emissions of all other radionuclides (excluding radon-220 and radon-222) must not exceed those amounts that would cause any member of the public to receive an effective dose equivalent of 10 mrem per year. Air emissions and releases of radioactivity will be monitored during the removal action to ensure compliance with these ARARs.

8.2 ACTION-SPECIFIC ARARS/TBCS

DOE Order 5400.5 requires radiation exposure to be kept "as low as reasonably achievable" (ALARA). Removal Action No. 31 will incorporate the ALARA process into the planning and implementation of the action.

Visible particulate emissions and fugitive dust must be controlled during the removal action. The State of Ohio requires that reasonably available control measures be installed to prevent fugitive dust from becoming airborne. Also, there shall be no visible particulate emissions

from any unpaved roadway, parking area, or material storage pile except for a time not to exceed 13 minutes during any hour.

8.3 LOCATION-SPECIFIC ARARS/TBCS

During the removal action, certain resources must be protected from destruction or adverse impact. Endangered species must be protected and any cultural resources (see Attachment I) in the area must be avoided. Section 9 identifies natural resources in the proposed project area and discusses avoidance and/or minimization of any adverse impacts.

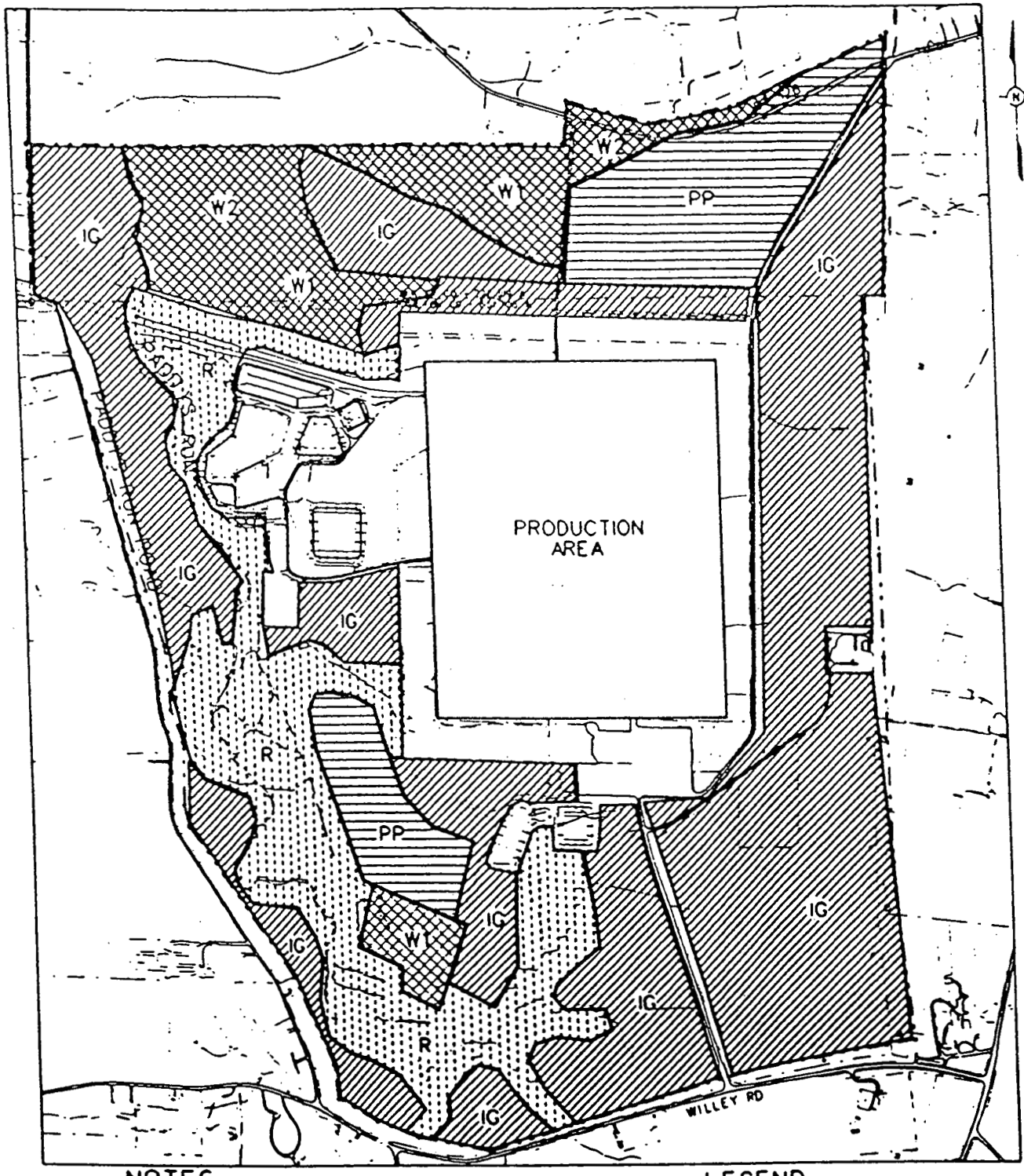
Additionally, the southern portion of the South Field and the western boundary of the Inactive Flyash Pile are located in the Paddys Run floodplain. Attachment H illustrates the location of the floodplain. DOE and EPA regulations require that impacts to the floodplain be avoided if possible, and minimized if avoidance is not feasible. Section 9, as well as Attachment H, discuss the requirements for implementing a removal action in a floodplain area.

9.0 MINIMIZATION/AVOIDANCE OF ENVIRONMENTAL IMPACTS

As discussed in Attachment H, the proposed removal action (i.e., RA 31) does not require National Environmental Policy Act (NEPA) documentation per the United States Department of Energy revised NEPA Policy Statement signed on June 13, 1994. However, this Section has been included to identify natural resources (e.g., habitats, floodplain) in the proposed project area and to incorporate natural resource values as a means to avoid and/or minimize any environmental impacts to the extent practicable. Natural resources in the proposed project area include early/mid-successional and riparian woodland, introduced grassland/old field, aquatic, threatened and endangered species habitats, and the Paddys Run 100- and 500-year floodplain (Figure 9-1). It is important to note that impacts identified in the following paragraphs have already been identified in the Operable Unit 2 FS/PP-EA as this removal action is an interim solution that will fit into the overall remediation of Operable Unit 2. Additionally, certain facilities constructed under this removal action (i.e., RA 31) will be used during the remediation.

Early/mid-successional and riparian woodlands are dominated by white ash (*Fraxinus americana*) and American elm (*Ulmus americana*). Potential habitat for the Federally-listed endangered Indiana bat (*Myotis sodalis*) exists in the woodland areas. Surveys completed in October 1994 determined that potential threatened or endangered plant species (as discussed in the Operable Unit 2 FS/PP-EA) are not present in these areas. Additionally, several taxa are primarily found only in the riparian area. Two of the most common taxa include the belted kingfisher (*Megaceryle alcyon*) and blue jay (*Cyanocitta cristata*). Common bats in the riparian area include the big brown bat (*Eptesicus fuscus*), the red bat (*Lasiurus borealis*), and the little brown bat (*Myotis lucifugus*). Approximately 0.9 hectare (ha), or 2.2 acres (ac) of woodlands will be disturbed during excavation and construction activities (including construction of Inactive Flyash Pile support facilities and an access road) along the north and northwestern edge of the Inactive Flyash Pile and along the eastern and southeastern edge of the South Field. Best management practices will be employed to minimize any woodland impacts. Upon consultation with U.S. Fish and Wildlife services, state agencies, natural resource trustees, and stakeholders, mitigation (as necessary) would be completed following any other remedial/removal activities i. e., Operable Unit 2 Remedial Action in the proposed area.

The introduced grassland/old field areas are generally inhabited by small mammals and several species of birds. Less than 0.4 ha (1.0 ac) of introduced grassland/old field habitat would be disturbed during the construction of South Field support facilities and a portion of the pipeline. Areas disturbed will be backfilled and re-seeded with native grass species following subsequent remediation.



NOTES

HABITAT BOUNDARIES ARE APPROXIMATE.

SCALE

0 800 1600 FEET

SCALE

0 225 450 METERS

LEGEND

INTRODUCED GRASSLAND (IG)

PLANTED PINE (PP)

RIPARAIN (R)

WOODLANDS
EARLY SUCCESSION (W1)
MID-SUCCESSION (W2)

FIGURE 9-1 HABITAT TYPES PRESENT ON THE FEMP

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Other disturbances could include the aquatic habitats within Paddys Run which supports a diverse community of macroinvertebrates and fish. Surveys performed by St. John (1993 and 1994) found state-listed threatened Sloan's crayfish (*Orconectes sloanii*) residing in Paddys Run. Direct impacts (i.e., excavation in the stream) will not occur. Any indirect impacts (e.g., runoff, sedimentation) will be avoided by utilizing engineering controls such as silt fences and straw bales.

Additionally, the 100- and 500-year floodplain of Paddys Run could be directly and indirectly impacted as a result of excavation and construction activities associated with the proposed action. Limited excavation and/or heavy equipment operating within the floodplain will occur during the excavation of contaminated sediments in the low area in the southeast corner of the South Field and during the installation of a sump/pump station and portion of a pipeline; however, any changes in flood elevation would be minimal. Engineering controls will be implemented to minimize indirect impacts (i.e., runoff, sedimentation). Appropriate floodplain documentation including a Floodplain Notice of Involvement, Floodplain Asessment, and Floodplain Statement of Findings was completed. The Assessment has been provided as Attachment H to this work plan.

An archeological investigation of the proposed project area (which imprints the boundaries of the Inactive Flyash Pile and the South Field) will not have to be completed as the area has been previously disturbed.

REFERENCES

U.S. Department of Energy, June 13, 1994. "NEPA POLICY STATEMENT, REVISED."

U.S. Department of Energy, August 1994. Operable Unit 2 Feasibility Study/Proposed Plan - Environmental Assessment.

U.S. Department of Energy, January 1995. Operable Unit 2 Remedial Investigation Report.

U.S. Department of Energy. Radiological Control Manual, DOE\EH-0256T.

U.S. Department of Energy, October 11, 1994. "Removal Site Evaluation for Seepage at the South Field and Inactive Flyash Pile."

EPA. 1991. U.S. Department of Energy, Feed Materials Production Center, Fernald, Ohio (OHG 890 008 976), Consent Agreement as Amended Under CERCLA Sections 120 and 106(a). Administrative Docket Number: V-W-90-C-057.

FERMCO, RM-0012. Quality Assurance Program, Revision No. 3, November 30, 1994.

A

Attachment A

Removal Site Evaluation

6514

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

SEEPAGE AT THE INACTIVE FLYASH PILE AND SOUTH FIELD AREAS

REMOVAL SITE EVALUATION

October 11, 1994

Prepared by

Fernald Environmental Restoration Management Corporation

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1.0 Introduction

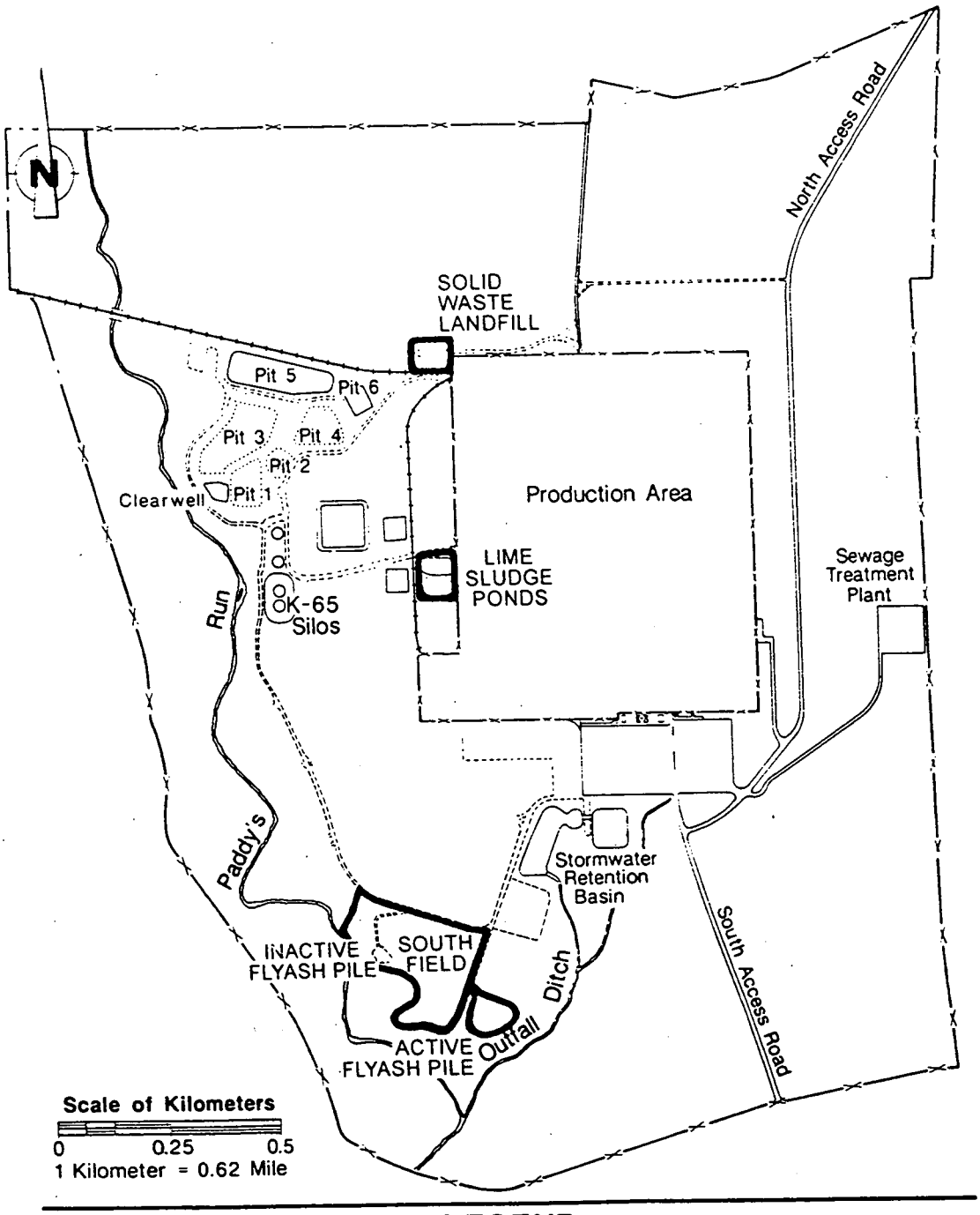
The Feed Materials Production Center, renamed on August 23, 1991 and hereinafter called the Fernald Environmental Management Project (FEMP), is a contractor-operated federal facility where purified uranium metal products were produced for the U.S. Department of Energy (DOE) between 1951 and 1989. The FEMP site is located on 1050 acres in a rural area of Hamilton and Butler counties, approximately 18 miles northwest of Cincinnati, Ohio.

The FEMP cleanup is being conducted under CERCLA and is grouped into five operable units to expedite remedial planning and implementation. Operable Unit 2 includes the Solid Waste Landfill, the North and South Lime Sludge Ponds, the Active Flyash Pile, the Inactive Flyash Pile, and the South Field. These waste areas were used for the storage/disposal of sanitary waste, spent lime sludge, flyash, and construction rubble. The primary characteristic of these waste areas is that they contain large volumes of waste with low concentrations of hazardous chemicals and/or radionuclides. Figure 1 shows the location and boundaries of Operable Unit 2.

The Remedial Investigation (RI) and Feasibility Study (FS) reports for Operable Unit 2 have been approved by the EPA based on the incorporation of their comments. The schedule for remediation of the South Field and Inactive Flyash Pile is tentatively set to begin in the fall of 1997. This is dependent on the availability of the disposal facility and is based on the current design and construction schedule.

As a result of Operable Unit 2 RI programs, it was found that surface water in the drainage ditches on the western edge of the Inactive Flyash Pile and the northern and eastern edges of the South Field was contaminated. Seeps that contribute to this surface water have been identified on the subunit sides of these drainage ditches and the approximate locations of these seeps are shown in Figure 2. This surface water is migrating directly to Paddys Run or to the Great Miami Aquifer through infiltration. The contaminant detected in the surface water is primarily uranium, but thorium, metals, and organics have also been detected.

This Removal Site Evaluation (RSE) is being initiated by the Department of Energy under authority delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section



LEGEND

- Location of Operable Unit 2 Subunits
- Covered Pit
- Railroad Spur
- Fence
- Roadway

Figure 1: FEMP Site Map

GRAPHICS #2617

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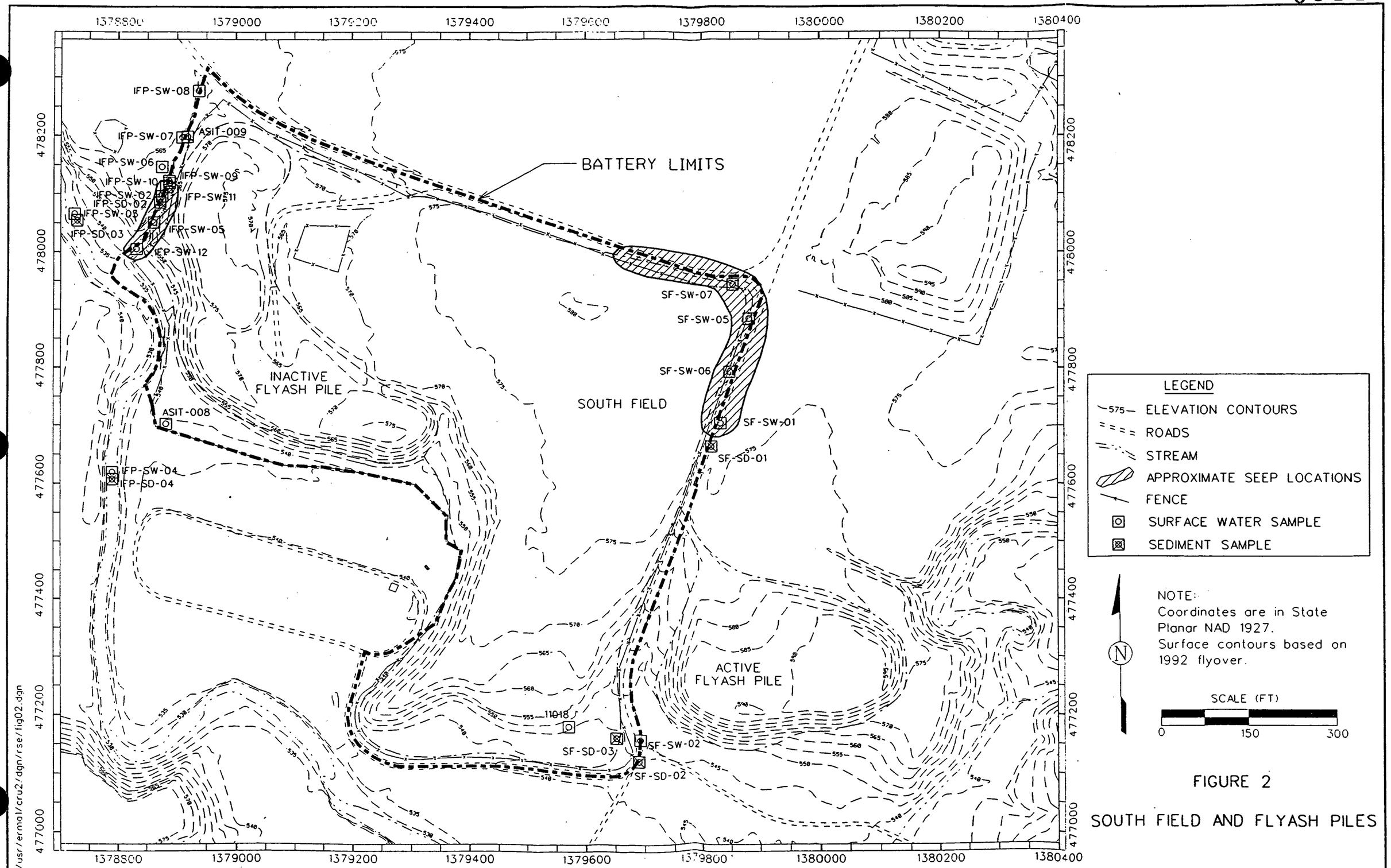


FIGURE 2

SOUTH FIELD AND FLYASH PILES

300:410 of the National Contingency Plan (NCP). The RSE is being conducted to determine whether conditions are present to warrant the implementation of a Removal Action to prevent seepage from affecting surface water and groundwater. This RSE will focus on determining the need for interim solutions that fit into the final remediation of the subunits.

2.0 Source and Nature of The Threat of Release

A comprehensive site evaluation was performed during the Remedial Investigation (RI)/Feasibility Study (FS) in the Inactive Flyash Pile and South Field areas. RI/FS environmental sampling and analyses programs were designed and implemented to address the data needs of a RI. The RI/FS field programs were completed in two phases, Phase I was completed from 1988 to 1992, and Phase II was completed in 1993. Data previously published for the FEMP were also considered, particularly those gathered as a part of (1) the Environmental Survey in 1985 and 1986 and (2) the Characterization Investigation Study conducted in 1986 and 1987. Data from all of these sources were evaluated in the RI. Samples were collected from surface media (including soils, lime sludge residue, and/or flyash), subsurface soils, surface water, drainage sediments, groundwater, and biota.

SOUTH FIELD

An estimated volume for the fill and waste materials in the South Field is 120,081 cubic yards. Materials in soil samples and trenches in the South Field are comprised of fill and construction debris. Twenty four Contaminants of Concern (COCs) were found in surface soil as a result of the RI sampling, fate and transport, and risk assessment evaluation. These twenty four contaminants include 12 radionuclides, three metals, and nine organics. The most significant contaminants in the South Field are the radionuclides radium-226, radium-228, thorium-228, thorium-232, uranium-238, and the metal total uranium. These contaminants produce the majority of risk to potential receptors. Contaminant transport to surface water was modeled and assessed. The risk assessment determined that no COCs were significant to the surface water pathway on the South Field because surface water on the subunits is not considered a drinking water source or a secondary pathway for edible fish. However, two COCs, radium-226 and technetium-99, were transported by surface water from the subunit to the Great Miami River. Also, uranium concentrations in the surface water are significant enough that if surface water were to reach the Great Miami Aquifer, the resulting groundwater concentration would produce a significant risk. The reason why contaminants are COCs in the Great

Miami River and the Great Miami Aquifer after being transported by surface water, but not COCs in surface water, is a result of receptor definitions. The results of the RI indicate that uranium isotopes and total uranium are the COCs for groundwater. Because of the potential for surface water to contaminate the groundwater and other surface water bodies, the impacts to surface water in the South Field need to be considered. Because of the significance of uranium in the groundwater pathway, uranium is the focus of subsequent analysis in this evaluation.

There are no perennial sources of surface water in the South Field subunit. Samples were collected after rain events occurred and when flow was available in a drainage. Surface water drainage originating at the northeast corner of the South Field and flowing south along the east boundary of the South Field was observed for extended periods after rain events finished, and two seeps were observed upstream of location SF-SW-01 (See Figure 2). Table 1 lists the surface water sampling results for the South Field. Concentrations of total uranium and isotopic uranium in surface water samples collected from the South Field drainage after rain events ranged from 110 μg/L at the upstream location (SF-SW-07) to 540 μg/L collected from standing water at the farthest downstream location (SF-SW-02) at the southeast corner of the South Field. These values are in approximate agreement with groundwater samples collected from the glacial till monitoring Well 1941 (388 μg/L to 547 μg/L) and Well 1942 (320 μg/L) completed at the east side of the South Field. This indicates that the observed drainage is representative of perched groundwater and shallow interflow at the east side of the subunit, and that the South Field has an impact upon drainage water.

Sediment samples were collected from the drainage during Phase II, and analytical data were consistent with the fill samples on the South Field. This indicates that the source of the sediments is the South Field surface soils. Total uranium concentrations in the sediments ranged from 15,000 to 30,000 ppb. A comparison of sediment and surface water indicates that soluble constituents like chloride and fluoride were detected in water samples but not in the sediment. This suggests that the drainage water originated as groundwater because these constituents require relatively long contact time to leach out of geologic materials. Chloride and fluoride are present at trace amounts in precipitation and so a source other than rainfall is indicated. These data support the belief that drainage water samples containing elevated uranium are representative of perched groundwater.

TABLE 1

SUMMARY OF RADIOISOTOPE CONCENTRATION
IN SURFACE DRAINAGE IN THE SOUTH FIELD

Sample	Data Collected	Activity or Concentration
SF-SW-07 farthest upstream	Sample 113666 collected 5/15/93 On-site analysis:	Total U = 110 μg/L
SF-SW-05 downstream of SW-07	Sample 113489 collected 5/6/93 On-site analysis:	Total U = 160 μg/L
SF-SW-06 downstream of SF-05	Sample 113490 collected 5/6/93 On-site analysis:	Total U = 250 μg/L
SF-SW-01 approximately midway along east side of South Field, downstream of SW-06	Sample 110422* and Sample 110424 collected 3/24/93 On-site analysis: Off-site analysis:	Total U = 400 μg/L U-234 = 110 pCi/L U-235/236 = 7.47 pCi/L U-238 = 136 pCi/L Total U = 340 μg/L
SF-SW-02 at southeast corner of South Field and most downstream of locations SW-07 to SW-01	Sample 110432* and Sample 110434 collected 3/25/93 On-site analysis: Off-site analysis:	Total U = 540 μg/L U-234 = 159 pCi/L U-235/236 = 7.4 pCi/L U-238 = 174 pCi/L Total U = 487 μg/L
11018 standing water at southeast corner of South Field after period of heavy rain. Sample is representative of accumulated surface drainage from South Field.	Sample 112633 collected 4/17/93 On-site analysis:	Total U = 560 μg/L

*Analyzed off site for full HSL, Rad.

INACTIVE FLYASH PILE

The volume of flyash and waste material was estimated for the Inactive Flyash Pile as 95,891 cubic yards. Flyash was dumped off a steep till embankment near to Paddys Run and thereafter, worked by bulldozers. The southern portion of the Inactive Flyash Pile has an approximate 7-foot soil/fill cover with a moderate vegetative cover. The northern portion, as indicated by the soil boring logs, does not have a soil cover. However, the northern portion is covered with moderate vegetation and stands of deciduous trees. Waste materials identified in samples collected from soil borings in the subunit included localized sludge-like material, clay tile drain pipe, wood, nails, wire, construction debris, and flyash. Samples of flyash collected from borings detected dry to moist conditions but never detected saturated samples. Very moist to wet conditions were detected at the interface of the Inactive Flyash Pile and the native till surface. Flyash and fill are in contact with the Great Miami Aquifer in the western and southern portions under the Inactive Flyash Pile.

Six COCs were determined for surface soil the Inactive Flyash Pile. The six COCs include four radionuclides, one metal, and one organic. No COCs were determined for surface water either on the subunit or in the Great Miami River, but the pathway still exists for surface water to transport contaminants to the Great Miami Aquifer. The uranium isotopes and total uranium metal are Inactive Flyash Pile COCs for groundwater, due in part to surface water transport to the Great Miami Aquifer. Because of the significance of uranium in the groundwater pathway, uranium is the focus of subsequent analysis in this evaluation.

There are no perennial sources of surface water within the battery limits of the Inactive Flyash Pile, so surface water was not present at several of the proposed drainage sampling locations. Surface water samples were collected on an "as-possible" basis after rainstorms. Drainage within a channel at the west side of the flyash pile was observed to flow for several days after significant rain events, and samples were collected at multiple locations to characterize seeps from the Inactive Flyash Pile.

Total uranium analyses of surface water in the west drainage were used to define the location of possible springs or seeps contributing to drainage from the Inactive Flyash Pile. Table 2 lists the surface water sampling results for the Inactive Flyash Pile. Data suggest that seepage from the west edge of the Inactive Flyash Pile is surfacing in the drainage in at least one location (See Figure 2). One location of observed seepage was sampled at IFP-SW-11 on May 18, 1993, where 820 μg/L total

TABLE 2

INACTIVE FLYASH PILE
SUMMARY OF DETECTED ANALYTES IN PHASE II
SURFACE WATER AND SEDIMENT SAMPLES

OFF-SITE ANALYSES OF SEDIMENT AND SURFACE WATER

Location	Description	Sample Number	Collection Date	Analyses	
				Uranium-238	Total-Uranium
IFP-SW-02	West drainage Surface Water	111828	4-26-93	59.7 pCi/L	165 µg/L
IFP-SW-02		112022	4-30-93	257 pCi/L	820 µg/L
IFP-SD-02	Sediment from above location	111812	4-17/93	1.68 pCi/g	12 µg/g
IFP-SD-02		112021	4-30-93		12.3 µg/g
IFP-SW-03	Paddys Run upstream of West drainage Surface Water	111819	4-21-93	1.74 pCi/L	5.25 µg/L
IFP-SW-03		112027	5-01-93	2.13 pCi/L	5.03 µg/L
IFP-SD-03	Sediment	111813	4-17-93		
IFP-SD-03		116219	5-01-93	0.9 pCi/g	4.09 µg/g
IFP-SW-04	Paddys Run downstream of West drainage Surface Water	11820	4-21-93	2.26 pCi/L	5.87 µg/L
IFP-SW-04		112015	4-29-93	1.84 pCi/L	4.57 µg/L
IFP-SD-04	Sediment	111815	4-17-93	ND	ND
		112017	4-29-93	ND	9.9 µg/g

ON-SITE ANALYSES OF TOTAL URANIUM IN SEEPS AND DRAINAGES

Location	Description	Surface Water Sample Number	Collection Date	Total Uranium µg/L
IFP-SW-02	Collected below seep area (medium flow)	111829	4-26-93	160
IFP-SW-02	Collected below seep (low flow)	112024	4-30-93	830
IFP-SW-03	Collected from Paddys Run upstream of confluence with drainage	111824	4-21-93	6
IFP-SW-03	Collected from Paddys Run upstream of confluence with drainage	112026	5-01-93	5.5
IFP-SW-04	Collected from Paddys Run downstream of confluence with drainage	111822	4-21-93	6
IFP-SW-04	Collected from Paddys Run upstream of confluence with drainage	112019	4-29-93	5
IFP-SW-05	Collected downstream of seep (low flow)	112029	5-02-93	910
IFP-SW-06	Upstream of possible seep from East bank of drainage	112030	5-02-93	23
IFP-SW-06	Upstream of possible seep from East bank of drainage	112031	5-02-93	23
IFP-SW-07	At confluence of North road drainage channel and the East drainage	112032	5-02-93	20
IFP-SW-08	Farthest upstream, collected just below drain culvert under North access road	112033	5-02-93	11
IFP-SW-09	Collected from upstream of seep in drainage channel	112034	5-03-93	81
IFP-SW-10	Collected from mixing zone in drainage adjacent to seep	113491	5-07-93	280
IFP-SW-11	Collected at seep into drainage after recession in drainage after heavy rain	116459	5-18-93	820
IFP-SW-12	Collected at confluence of drainage and Paddys Run above sand unit where drainage recharges to the GMA	116460	5-18-93	370

ND = Not detected

uranium was detected. Upstream and downstream concentrations were 23 μg/L (IFP-SW-06) and 910 μg/L (IFP-SW-05), respectively, on May 2, 1993. Surface water drainage was traced downstream to where it soaked through the bottom of the sandy stream channel. Total uranium in a sample collected slightly upstream of this location was 370 μg/L (IFP-SW-12) on May 18, 1993. Field observations, therefore, indicate that recharge to the regional aquifer occurs by surface water from the west drainage. Analytical data indicate that the recharge water has elevated concentrations of uranium.

One sediment sample collected during Phase I detected total uranium in the drainage ditch upstream of the Inactive Flyash Pile at 5,000 ppb. One Phase II sediment sample collected in the drainage ditch detected total uranium at 12,300 ppb. Total uranium and other constituents detected in the sediment samples are consistent with surface soil samples on the Inactive Flyash Piles. Sediment samples in Paddys Run upgradient and downgradient of the drainage ditch indicate that the drainage from the Inactive Flyash Pile has contributed contaminated sediment to Paddys Run.

3.0 Evaluation of The Magnitude of The Potential Threat

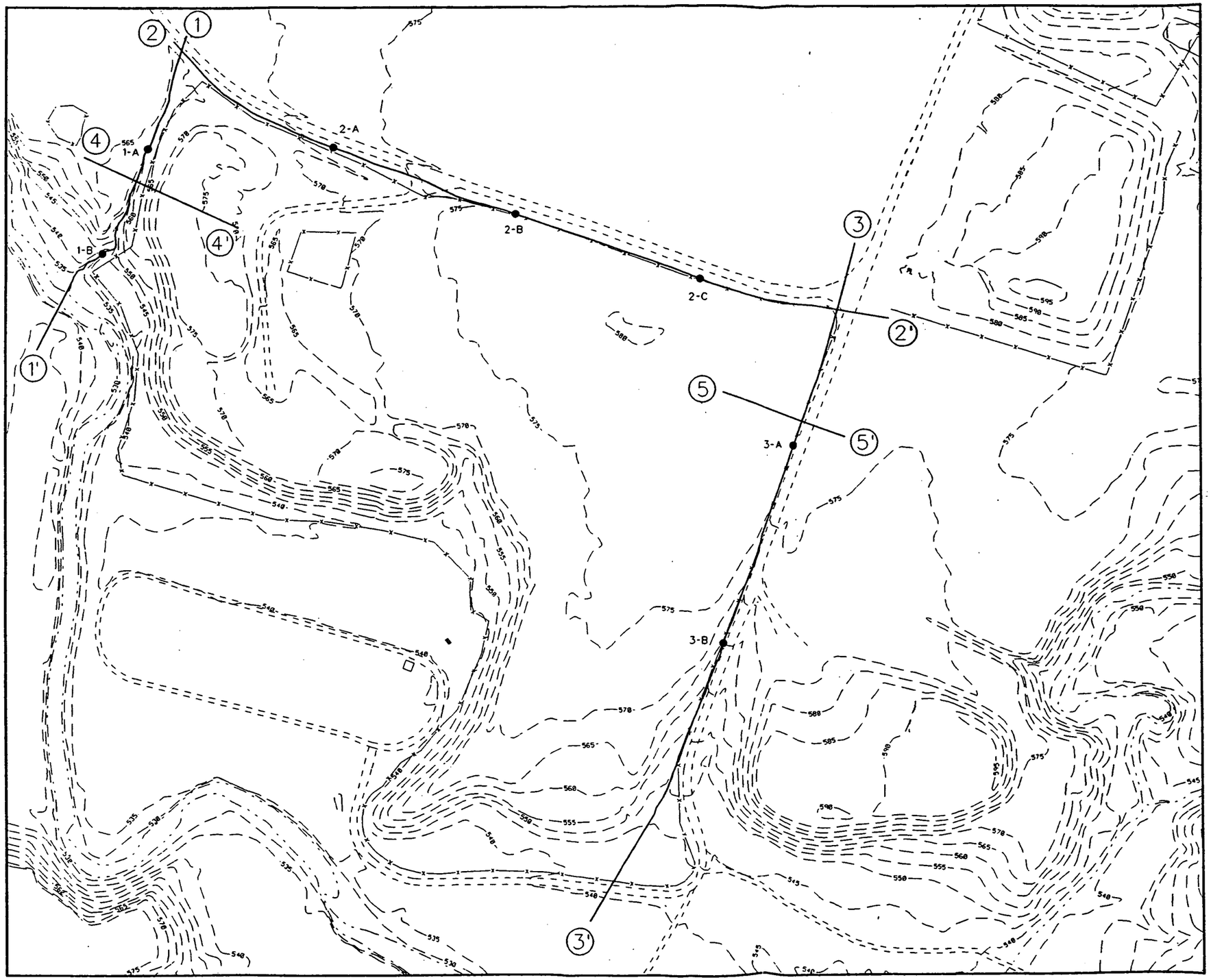
Surface water and sediment with above background concentrations of uranium have been detected in the drainage ditches on the western edge of the Inactive Flyash Pile, and the northern and eastern edges of the South Field. The source of surface water containing above background concentrations of uranium is either from surface water runoff that erodes contaminated materials or seepage through contaminated materials. Because the surface water samples were taken a few days after rainfall events and the areas are well vegetated, the source of contaminated water is thought to more likely be seepage. There is a potential threat to humans and the environment from seeps and sediment in these areas.

Seeps along the north and east boundaries of the South Field empty into a drainage ditch that borders the South Field and flows south to a shallow depression. Once in this depression the surface water evaporates and infiltrates into the soil. This drainage channel flows intermittently during and after rainfall events. Sediments in this ditch have above background concentrations of total uranium. The sediments are in contact with surface water, allowing some of the uranium to leach out of the sediments and into the water, depending on the time of contact and the soil/water partitioning coefficient. The sediments are also washed down into the depression at the base of the South Field

where they sit over the Great Miami Aquifer and in contact with pooled surface water. The transportation of surface water occurs more rapidly then the transportation of groundwater and the transport of contaminated surface water to a recharge point for the Great Miami Aquifer at the southeast corner of the South Field spreads the contaminants wider than would occur from vertical leaching. A profile and cross section of this drainage ditch are shown in Figure 3 and 4. The profile and cross section of this drainage ditch indicates that the drainage ditch is not deep enough to intercept the interstitial sand layer and does not intercept the Great Miami Aquifer until it reaches the depression into which it drains. Figure 5 shows contours of uranium in a cross section from the drainage ditch on the eastern edge of the South Field.

Seeps along the steep slope of the western side of the Inactive Flyash Pile run into a drainage channel that flows southwest toward Paddys Run. The drainage channel flows intermittently after storm events. Low flows in the channel infiltrate into a low area at the base of the Inactive Flyash Pile. Moderate or fast flow during a storm event discharges into Paddys Run. The transportation of surface water occurs more rapidly then the transportation of groundwater and the transport of contaminated surface water to a recharge point for the Great Miami Aquifer at the southwest corner of the Inactive Flyash Pile spreads the contaminants over a broader area than would occur from vertical leaching. A profile and cross section of the drainage channel is shown in Figures 3 and 4. The profile and cross section indicates that the drainage channel intercepts both an interstitial sand layer and the Great Miami Aquifer. The seeps identified in this drainage feature enter the ditch along the side of the Inactive Flyash Pile where the interstitial sand layer exists.

Sediments were sampled in the ditch and were slightly above background, but the slope of the ditch is much steeper then for the drainage ditch in the South Field, and the bottom of the ditch is erosional rather then depositional. Sediments are carried down the drainage ditch and deposited in a low area where intermediate and low flows seep vertically into the Great Miami Aquifer. Sediments in this low area have above background concentrations of total uranium. The sediments are in contact with surface water, allowing some of the uranium to leach out of the sediments and into the water, depending on the time of contact and the soil/water partitioning coefficient. Figure 5 shows contours of uranium in a typical cross section of the drainage ditch along the Inactive Flyash Pile.



LEGEND

- 575 — EXISTING ELEVATION CONTOURS
- EXISTING ROADS
- EXISTING STREAM
- EXISTING FENCE
- 3-B ● REFERENCE POINT
- CROSS SECTION

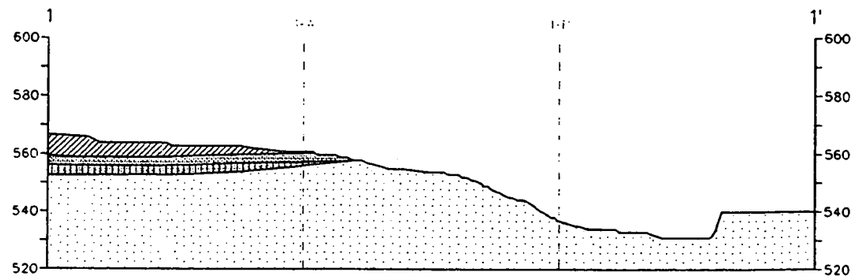
NOTE:
Surface contours based on 1992 flyover.

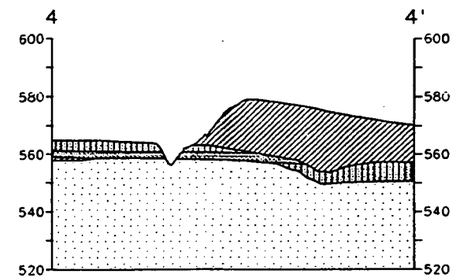
N

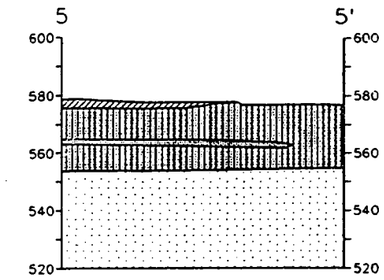
SCALE (FT)
0 150 300

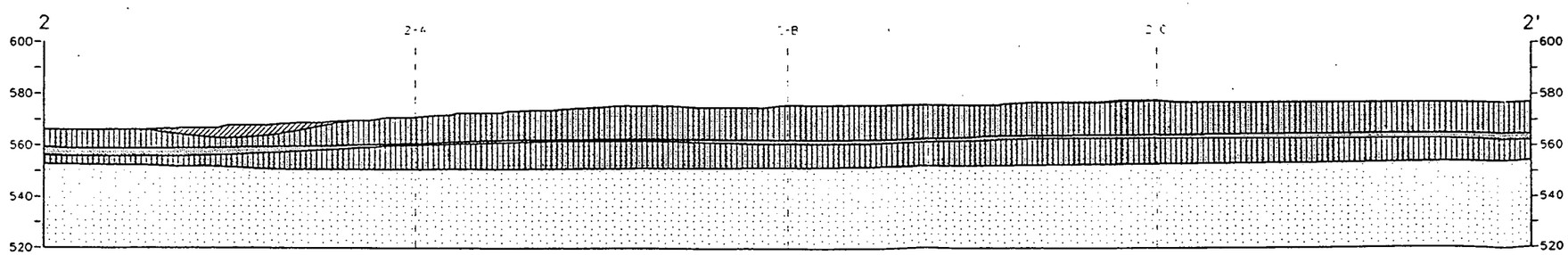
FIGURE 3
SITE PLAN
REMOVAL SITE EVALUATION
SEEPAGE CONTROL

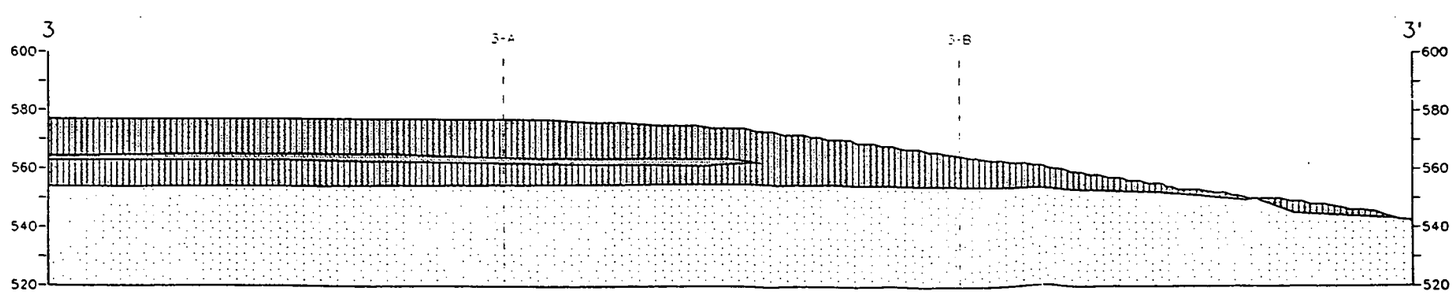
/usr/ermal/cru2/dgn/rse/fig03.dgn











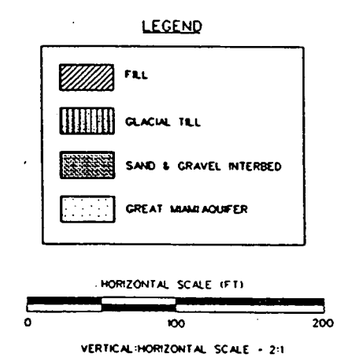


FIGURE 4
CROSS SECTIONS AND PROFILES
OF THE DRAINAGES FOR THE
SOUTH FIELD AND INACTIVE FLYASH PILE

000051

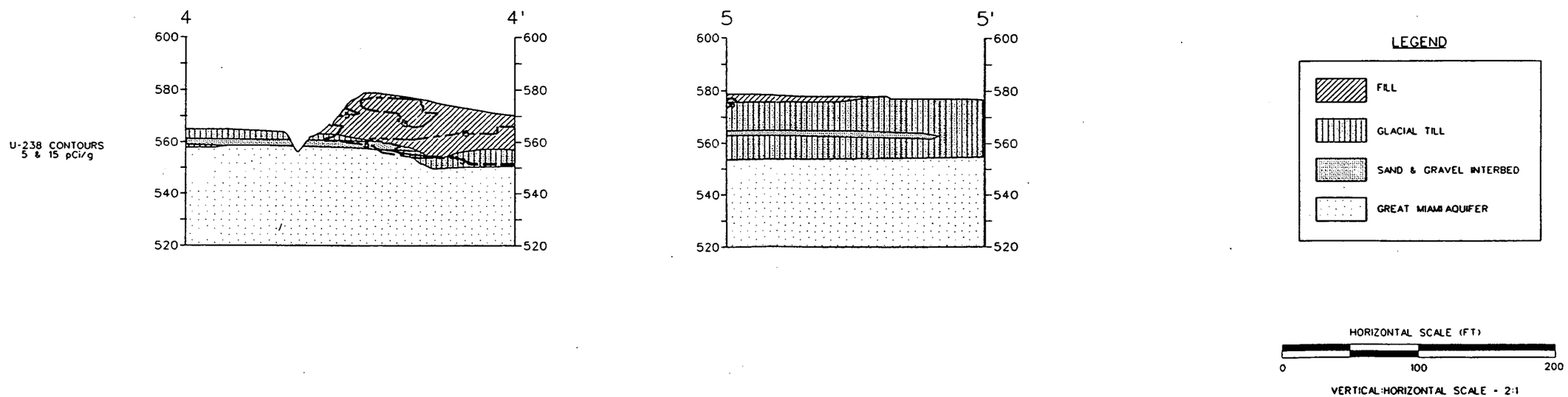


FIGURE 5
U-238 CONCENTRATIONS ALONG THE DRAINAGE CHANNELS IN THE INACTIVE FLYASHPILE AND SOUTH FIELD

000052

/usr/ermal/cru2/dgn/rse/lnq04.dgn

Figure 6 presents the topography of the South Field and Inactive Flyash Pile, and indicates the drainage area for the South Field and Inactive Flyash Pile drainage ditches. The shaded area represents the portion of the subunit that could contribute to the seeps and surface water flowing in the ditches. Most of the sediments in the ditches are not likely to have resulted from recent surface runoff due to the vegetative cover on the South Field and Inactive Flyash Pile. The contaminated sediments are more likely to be remnants from deposition that occurred when the South Field and Inactive Flyash Pile were active.

Total uranium concentrations in surface water near the seeps are greater than 500 ppb in the South Field and 800 ppb in the Inactive Flyash Pile. Sediment concentrations in the South Field and Inactive Flyash Pile are greater than 50,000 ppb and 10,000 ppb respectively. Uranium concentrations in groundwater downgradient of the surface water discharge locations are greater than 300 ppb in the South Field and 1800 ppb in the Inactive Flyash Pile. The drinking water standard for concentrations of uranium is 20 ppb. The analytical data suggests that the seeps from the Inactive Flyash Pile and South Field are contributing to total uranium contamination in the Great Miami Aquifer that exceeds the regulatory limit for drinking water. The impact to groundwater is one to two orders of magnitude above the drinking water standard. The range of detected concentrations of total uranium in the Inactive Flyash Pile and South Field wastes is 1050 to 3,580,000 ppb. The large volume of waste and the high concentrations of uranium indicate that the release of uranium through seepage and contaminated sediments could continue at the present concentration until the subunits are remediated.

4.0 Assessment of The Need for a Removal Action

As outlined in Section 40 CFR 300.415, eight factors are to be considered when determining the appropriateness of a removal action. The consideration of those factors is presented in the table below.

Factor	Applicable to this Removal Action?		Comment
	Yes	No	
Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants	✓		The contaminated seepage drains into Paddys Run and areas that recharge the Great Miami Aquifer. This results in the potential for human consumption of the groundwater as well as direct contact by wildlife.
Actual or potential contamination of drinking water supplies or sensitive ecosystems	✓		The contaminated seepage drains to areas that recharge the Great Miami Aquifer.
Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release		✓	Neither the seepage nor the source material is in bulk storage containers.
High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate		✓	The levels have been measured in the range of 110 to 910 ug/L in the seepage water.
Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released	✓		While wet weather leads to the development of the seepage, it does not of itself result in a major release.
Threat of fire or explosions		✓	Neither the source material nor the seepage are thought to be flammable.
The availability of other appropriate federal or state response mechanisms to respond to the release		✓	No other response mechanisms (other than site remediation) have been identified.
Other situations or factors that may pose threats to public health of welfare or the environment		✓	None have been identified.

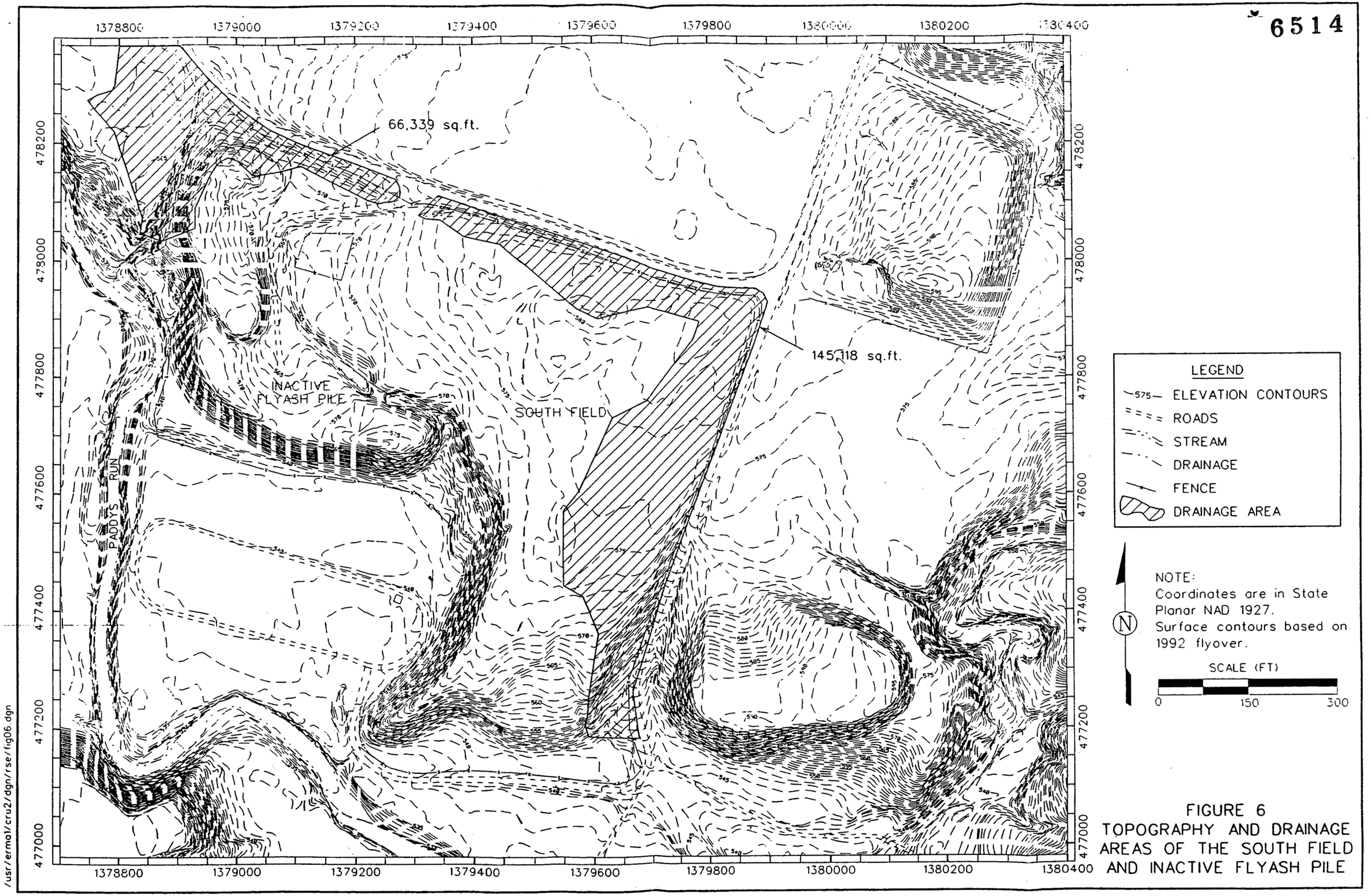


FIGURE 6
TOPOGRAPHY AND DRAINAGE AREAS OF THE SOUTH FIELD AND INACTIVE FLYASH PILE

As noted in the table, the seeps result in potential exposure to humans and animals as well as contamination of the Great Miami Aquifer. This is somewhat mitigated by the fact that no human receptors are currently known to be affected by the release of uranium in surface water.

5.0 Appropriateness of a Response

If it is determined that a response is appropriate due to the potential exposure to and on-going release of contamination in the IFP/SF seeps, a removal action to address the seepage from the fill material and the presence of contaminated sediments should be undertaken.

DOE will evaluate the appropriateness of a response action and will prepare an Action Memorandum. If DOE concurs that an action is appropriate, they will issue an Action Memorandum that will describe the selected response and provide supporting documentation for the decision.

If it is determined that a planning period of greater than six months exists prior to initiation of a response, DOE will issue an Engineering Evaluation/Cost Analysis approval memorandum. This memorandum is to be used to document the threat to public health and the environment and to evaluate viable alternative response actions.

Based on the evaluation of the factors described in earlier sections of this document, it has been determined that seepage and contaminated sediments pose a potential threat to environmental and human receptors. The seeps and sediments serve as a mechanism for rapid surface transport of contaminants that in turn infiltrate to the Great Miami Aquifer. There is also a potential that this surface water pathway is contributing to the off-site contaminant plume. While addressing only a subset of the total threat posed by the materials in the IFP and SF, control of these mechanisms would prevent contaminated seeps and surface water from recharging the Great Miami Aquifer. Such controls would need to prevent or intercept seepage, and prevent surface water from leaching uranium from contaminated sediments and then infiltrating into the Great Miami Aquifer. Though remediation of the South Field and Inactive Flyash Pile will be first priority in Operable Unit 2 remedial actions, remedial activities are at least three years away. The implementation of a removal action prior to remediation would prevent the continued spread of contamination by seeps and surface water and would not conflict with the final remediation of the subunits.

6514

B

Attachment B

Action Memorandum

DOCUMENT FILE NO. 6514 4252

Department of Energy
Fernald Environmental Management Project
P. O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 648-3155

OCT 2 5 1995

103.1

DOE-0069-95

Mr. Don Ofte, President
Fernald Environmental Restoration
Management Corporation
P.O. Box 538704
Cincinnati, Ohio 45253-8704

Dear Mr. Ofte:

ACTION MEMORANDUM: SOUTHFIELD AND INACTIVE FLYASH SEEPAGE CONTROL

The enclosed Removal Site Evaluation for the Southfield and Inactive Flyash Pile Seepage Control area has been reviewed by my office. Based on this review, the Department of Energy, Fernald Area Office (DOE-FN) has determined that this project constitutes a time-critical removal action. The Administrative Record file for the removal action should include this document.

The Fernald Environmental Restoration Management Corporation (FERMCO) should proceed with completion of the necessary actions to prepare a Removal Action Work Plan (RAWP). The RAWP should address the controls required to prevent seepage and infiltration in this area from transporting contaminants into the Great Miami Aquifer. The Work Plan should be transmitted to DOE-FN within sixty (60) days from the receipt of this Removal Action Memorandum.

If you or your staff have any questions, please contact Jay Jalovec at (513) 648-3122. Thank for your time and cooperation in this matter.

Sincerely,

Glenn Griffith
for J. R. Craig
Acting Director

FN:Jalovec

Enclosure: As Stated

cc w/enc:

J. A. Saric, U.S. EPA
T. A. Schneider, OEPA

Recycled and Recyclable

cc w/o enc:

R. Warner, DOE-FN
N. S. Weatherup, FERMCO/51-2
G. N. Jones, FERMCO/51-2
G. T. Becker, MTC/45

Attachment C

Evaluation of Alternatives

Fernald Environmental

FERMCO

Restoration Management Corporation P.O. Box 398704 Cincinnati, Ohio 45239-8704 (513) 738-6200

6514

December 15, 1994

U. S. Department of Energy
Fernald Environmental Management Project
Letter No. C:OP:94-1292

Mr. Jack R. Craig, Acting Director
Department of Energy
Fernald Area Office
P. O. Box 538705
Cincinnati, Ohio 45253-8705

Dear Mr. Craig:

CONTRACT DE-AC24-920H21972, TRANSMITTAL OF EVALUATION OF ALTERNATIVES FOR SEEPAGE CONTROL AT THE SOUTH FIELD (SF) AND INACTIVE FLYASH PILE (IFP)

FERMCO is pleased to submit the enclosed Evaluation of Alternatives for Removal Action No. 30 (RA No. 30), Seepage Control at the SF and IFP. This evaluation has been developed in support of the Work Plan that is being prepared in response to an action memorandum from DOE (DOE-0069-95). Because of the time critical nature of this removal action, FERMCO is currently proceeding with development of a Work Plan and a Request for Project Order Plan based on the proposed alternative. While DOE will be requested to provide formal review and approval of the Work Plan, any DOE comments on the Evaluation of Alternatives would be welcomed.

Sincerely,

Don Ofte, President

DO:tdo
Attachment

Fernald Environmental
FERMCO
Restoration Management Corporation

c w/attachment: File Record Storage Copy 102.1
J. Reising, DOE-FN, MS 45
R. Warner, DOE-FN, MS 45
J. Jalovec, DOE-FN, MS 45
G. Becker, MTC, MS 45
G. Jones, MS 51-2
N. Weatherup, MS 51-2
J. Williams, MS 51-2
U. Kumthekar, MS 51-2
T. Hagen, MS 65-2

c w/o attachment: L. E. Parsons, DOE Contract Specialist
P. Norman, MS 51-2

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

REMOVAL ACTION NO. 30: SEEPAGE CONTROL AT THE SOUTH FIELD AND INACTIVE FLYASH PILE

EVALUATION OF ALTERNATIVES

December 14, 1994

Prepared by

Fernald Environmental Restoration Management Corporation

REMOVAL ACTION NO. 30:
SEEPAGE CONTROL AT THE SOUTH FIELD AND INACTIVE FLYASH PILE

EVALUATION OF ALTERNATIVES

1.0 PURPOSE

The purpose of this evaluation of alternatives is to identify and evaluate engineered solutions for minimizing the impacts of contaminated seepage and infiltration in the South Field (SF) and Inactive Flyash Pile (IFP). This document was developed in response to the Removal Site Evaluation (RSE) of Seepage at the SF and IFP (FERMCO, 11 October 1994) and the subsequent action memorandum from the Department of Energy (Letter DOE-0069-95, 25 October 1994).

The RSE identified the following two mechanisms by which contamination is transported along the eastern edge of the SF and the western edge of the IFP:

- Contaminated seepage flows from the materials at the SF and IFP, moves along the perimeter ditches, and infiltrates into the Great Miami Aquifer (GMA) at locations where the aquifer sands outcrop. The sands are exposed both in the lower portions of the ditches themselves and in a flat area at the southeast corner of the SF. During dry periods, concentrations of contaminants in water in the drainage ditches are higher due to lack of dilution when the seepage enters the ditches. In contrast, seepage during wet periods is diluted by relatively clean surface runoff. The goal in this analysis is to capture the seepage in its more contaminated state.

- Runoff infiltrates through contaminated sediments in the southeast corner of the SF, thereby leaches uranium, and then enters the GMA. There is some opportunity for sediment to continue to be carried from the northern portions of the SF down the perimeter drainage ditch and be deposited in the southeast corner. Hence, the goal of RA 30 is to address infiltration through the sediment in the southeast corner of the SF and to minimize the potential that future sediment transport in the SF drainage ditch would deposit contaminated sediment in the southeast corner of the SF.

Figure 1 presents a plan view of the SF/IFP area and shows the locations of the drainage ditches and seeps at the subunits, as well as the location where sediments can contribute to contamination of the GMA.

2.0 EVALUATION OF REMOVAL ACTION COMPONENTS

Table 1 identifies removal action components that are potentially applicable to mitigation of the transport mechanisms identified in the RSE. Table 1 also indicates whether each removal action component is applicable to seepage control, sediment control, or both. The two right-most columns in Table 1 present the advantages and disadvantages of the various removal action components. As can be seen in Table 1, only complete excavation of the source material would address both transport mechanisms. However, combinations of removal action components would address the most significant aspects of the contaminant transport mechanisms. The potential for utilizing the components for the current removal action can be summarized as follows:

- Besides being extremely expensive compared to other potential removal action components, excavation of the source material could not be implemented on a significantly faster time frame than that already being proposed for Operable Unit 2 (OU2) remediation. Therefore, this component will not be considered further as a short term solution to the contaminant transport mechanisms under consideration.

- Preventing infiltration, whether by placing a synthetic or natural cover on a temporary basis, would be expensive compared to other potential removal action components. Also, this component would disturb a large area and potentially promote erosion in areas that were not covered. Therefore, this potential component will not be considered further.

- The remaining components provide degrees of effectiveness for the transport mechanisms under consideration, can be implemented within a few months, and were judged to be much less expensive than the first two components. Therefore, all three of these components were retained for consideration in alternatives.

3.0 ALTERNATIVES

Of the three components that remained after evaluation, only one addresses sediment that currently exists in the southeast corner of the SF. Two components address seepage. Therefore, two alternatives were developed. Both alternatives include removal of sediments, but one utilizes interception of seepage while the other utilizes collection of seepage and initial storm runoff:

Alternative 1: Seepage Interceptor System and Removal of Sediment

Alternative 2: Seepage Collection System and Removal of Sediment

These alternatives will be compared based on consideration of effectiveness, implementability, and cost.

3.1 Description of Alternatives

In order to allow comparison, the two alternatives are described below. These general descriptions were used for planning and estimating purposes, but detailed proposals for implementation of the removal action components will be finalized during design. Section 3.2 provides a comparative evaluation.

3.1.1 Alternative 1: Seepage Interceptor System and Removal of Sediment. The seepage interceptor system would collect contaminated seepage from the source material and prevent its entering drainage ditches. A conceptual layout of the seepage interceptor system is shown on Figure 2. The seepage interceptor system would include the following at each subunit:

- A French drain consisting of a trench, approximately 8 feet deep, with lower 5-feet filled with gravel and a perforated pipe placed at the trench bottom to collect seepage

- A geomembrane liner on top of the gravel to prevent surface runoff from entering the seepage collection system

- A wet-well with pump station for transferring the contaminated seepage out of the French drain system to the on-site Advanced Waste Water Treatment (AWWT) Facility

- Regrading and reseeding of the existing ditch disturbed during installation of the seepage interceptor system

Along the west side of the IFP, the existing drainage would be rerouted and the existing culvert would be extended. This would reduce the opportunity for stormwater to enter the French drain system.

This alternative also includes removal of contaminated sediment in the low area in the southeast corner of the SF to prevent leaching of contaminants into the GMA. The sediment removed from the SF and the source material excavated during the installation of the seepage interceptor system would be placed in a stockpile with access and drainage controls.

This alternative would effectively collect contaminated seepage before that seepage contributed to surface runoff and would minimize contamination of the GMA due to infiltration through sediment.

3.1.2 Alternative 2: Seepage Collection System and Removal of Sediment. A seepage collection system would collect contaminated seepage entering into the existing drainage ditches. A conceptual layout of the seepage collection system is shown on Figure 3. The seepage collection system would include the following:

- A weir/sump with a water level activated pump would be located in the drainage ditch at each subunit upstream of the outcropping of the GMA sands. The seepage and surface runoff collected in the sump would be pumped to the AWWT Facility. The pump would be activated by water level controls installed in the sump. The pump would be activated by a high level control and deactivated by a low level control. During rainfall events that produce flow rates greater than that which can be handled by the sump pump, runoff will spill over the weir and drain downstream. Sediment would be trapped in the sump and routinely removed.

- Regrading and reseeding of the drainage ditches where disturbed by the installation of the seepage collection system.

Along the west side of the IFP, the existing drainage would be rerouted and the existing culvert would be extended. This would reduce stormwater flow along the drainage ditch and minimize overflow of the sump.

This alternative also includes removal of contaminated sediment in the low area in the southeast corner of the SF to prevent leaching of contaminants into

the GMA. The sediment removed from the SF and the source material excavated during the installation of the seepage interceptor system would be placed in a stockpile with access and drainage controls.

This alternative would mitigate the potential threats by collecting seepage plus surface runoff from the initial portions of storm events. Removal of contaminated sediment from the southeast corner of the SF would minimize contamination of the GMA due to infiltration through sediment.

3.2 Evaluation of Alternatives

The alternatives will be compared based on consideration of effectiveness, implementability, and cost. Effectiveness will address removal of the potential threats identified within the RSE. Implementability will address the ability to implement the solution in a timely manner and with minimal disturbance of the environment. Cost will address the total estimated cost.

3.2.1 Effectiveness of Alternatives. Both Alternative 1 and Alternative 2 would be highly effective in removing the potential threats due to seepage and contaminated sediments, but both have minor disadvantages. Alternative 1 would not capture contaminated sediments that might be carried in surface runoff. Alternative 2 would allow seepage to enter the drainage ditches before being collected in the sumps. This could allow minor infiltration of seepage into the clay that forms the bottom of the drainage ditches and could allow high volume storm events to carry some contamination over the sumps. As a result, Alternative 1 is considered marginally more effective than Alternative 2.

3.2.2 Implementability. Alternatives 1 and 2 could both be initiated within 6 months and would have short construction times (a few months). Therefore, Alternatives 1 and 2 would have equal timeliness. However, Alternative 1 utilizes a French drain system which would require disturbing a much greater area in each subunit that Alternative 2. Besides creating less potential for future erosion, Alternative 2 minimizes the overall excavation within controlled areas and is thus somewhat more implementable than Alternative 1.

3.2.3 Cost of Alternatives. The estimated costs for the alternatives are presented in the table below. Engineering and Operation and Maintenance (O & M) costs were not considered to be significantly different for the two alternatives and were estimated as the same costs. Engineering includes predesign, detailed design, and services during construction. O & M costs include operating expenses, sump cleanout, safety checks, and engineering inspections. construction costs include labor, materials, equipment, construction management, risk budget, and contingencies.

Cost Component	Alternative 1	Alternative 2
Engineering	$327,000	$327,000
Construction	$1,361,800	$970,300
O&M (3 years)	$126,000	$126,000
TOTAL	$1,814,800	$1,423,300

4.0 PROPOSED ALTERNATIVE

Table 3 summarizes the rankings of the alternatives with regard to the major factors for comparison. Based on this comparison, the proposed alternative for this removal action is Alternative 2: Seepage Collection System and Removal of Sediment.

Alternative	Effectiveness	Implementability	Cost	Average
1	1	2	2	1.7
2	2	1	1	1.3

TABLE 1: EVALUATION OF REMOVAL ACTION COMPONENTS

Potential Removal Action Component	Example	Applicable to Contaminant Transport Mechanisms?		Advantages	Disadvantages
		Seepage	Infiltration through sediment		
Excavate source material	OU2 Proposed Remediation	Yes	Yes	- Eliminates seepage and sediment mechanisms of contamination	- Very expensive (approximately $73.5 million[a,b]) - Would require disposal facility - Would require longer duration for implementation
Prevent Infiltration	Geomembrane over entire area contributing infiltration and sediment	Yes	No	- Would effectively eliminate infiltration of direct precipitation	- Expensive (approximately $3.4 million[a]) - Would result in large volume of cleared debris - Would not eliminate infiltration through sediment - Would require application over a large area to cut off infiltration - Could create drainage and erosion problems at other locations due to increased runoff volume - Seepage might continue under the geomembrane liner - Would require routine maintenance of geomembrane
Intercept Seepage	French drain system	Yes	No	- Would effectively collect seepage flows	- Would require excavation along ditches (such excavation would disturb large areas during construction and therefore increase erosion potential) - Would not address infiltration through sediments
Collect Seepage and Initial Storm Runoff in Drainage Ditches	Collect seepage and stormwater in wet well/pump station	Yes	No	- Would effectively capture seepage during initial storm runoff - Would capture limited amounts of sediment from upstream sources - Would disturb only a small area in each drainage ditch (thus minimizing erosion)	- Would not address infiltration through sediments - Not totally effective during large volume storm events
Remove Sediments	Excavate sediments and dispose in controlled area	No	Yes	- Would minimize contamination of GMA due to infiltration through contaminated sediment	- Would require relocation of sediment; - Would not eliminate seepage; - Would not eliminate future erosion

Note: Shading indicates that component was not utilized in alternatives.

[a]1994 dollars

[b]Based on costs in OU2 FS for Alternative 6, SF and IFP only

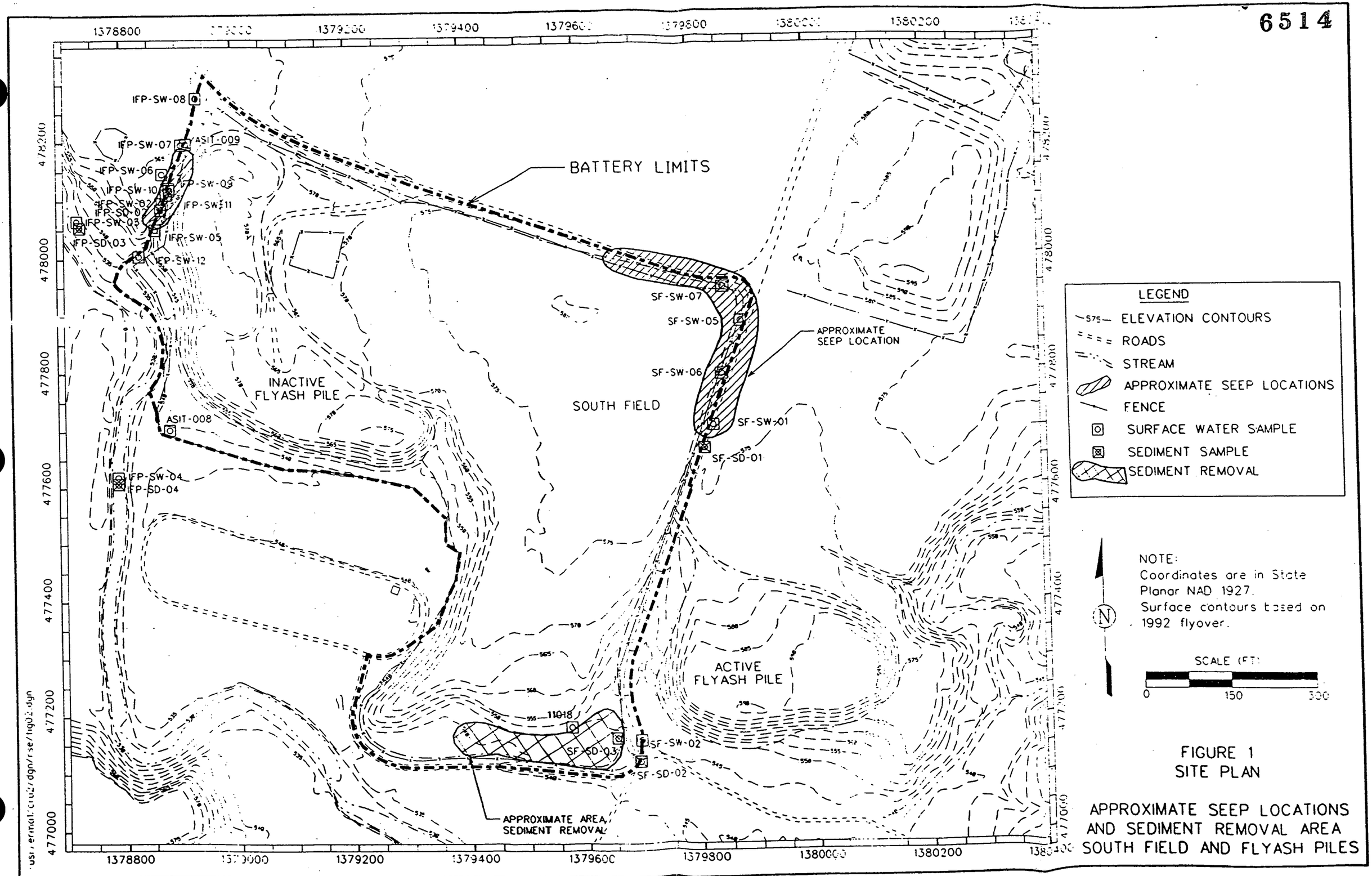


FIGURE 1
SITE PLAN

APPROXIMATE SEEP LOCATIONS AND SEDIMENT REMOVAL AREA SOUTH FIELD AND FLYASH PILES

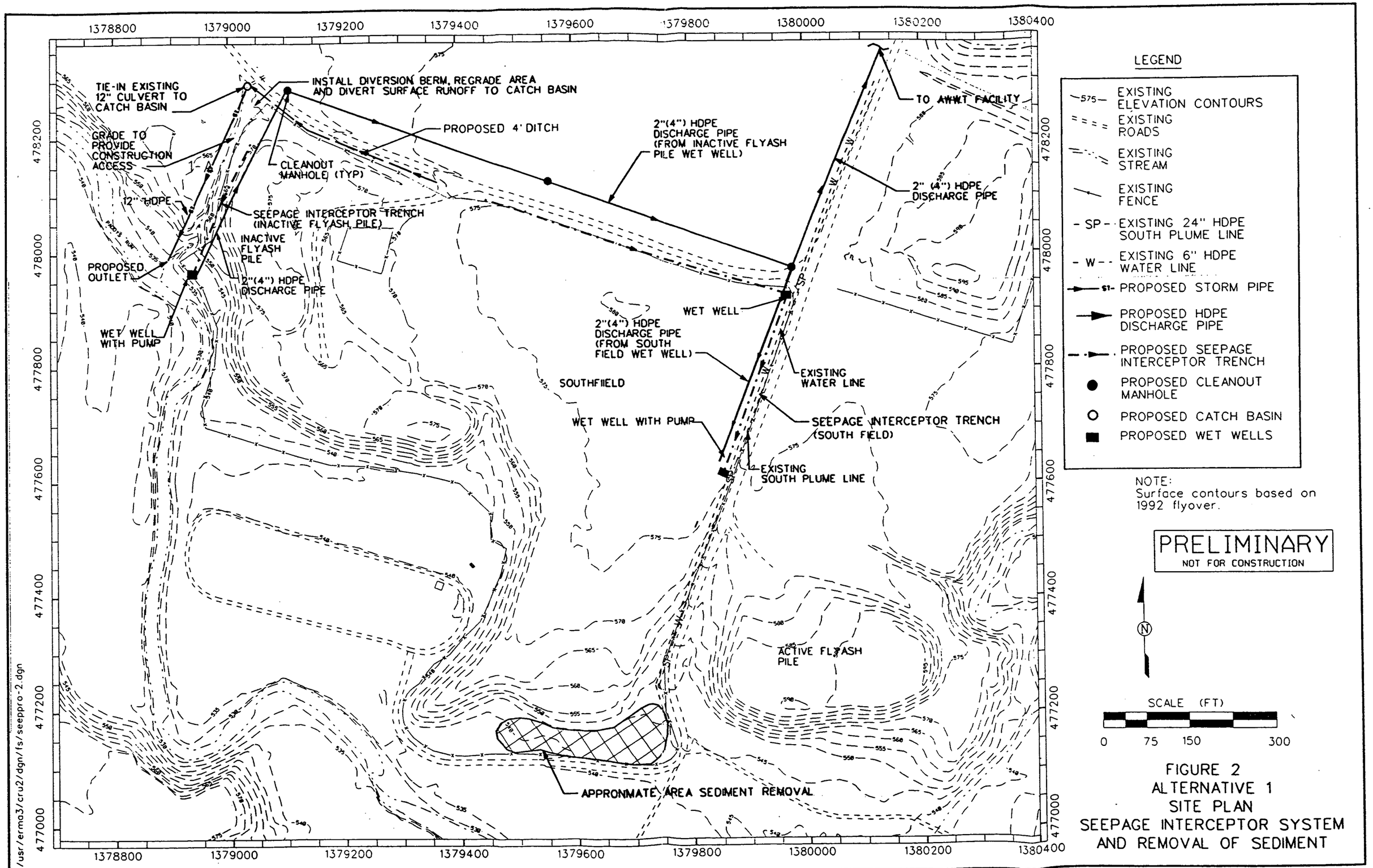


FIGURE 2
ALTERNATIVE 1
SITE PLAN
SEEPAGE INTERCEPTOR SYSTEM
AND REMOVAL OF SEDIMENT

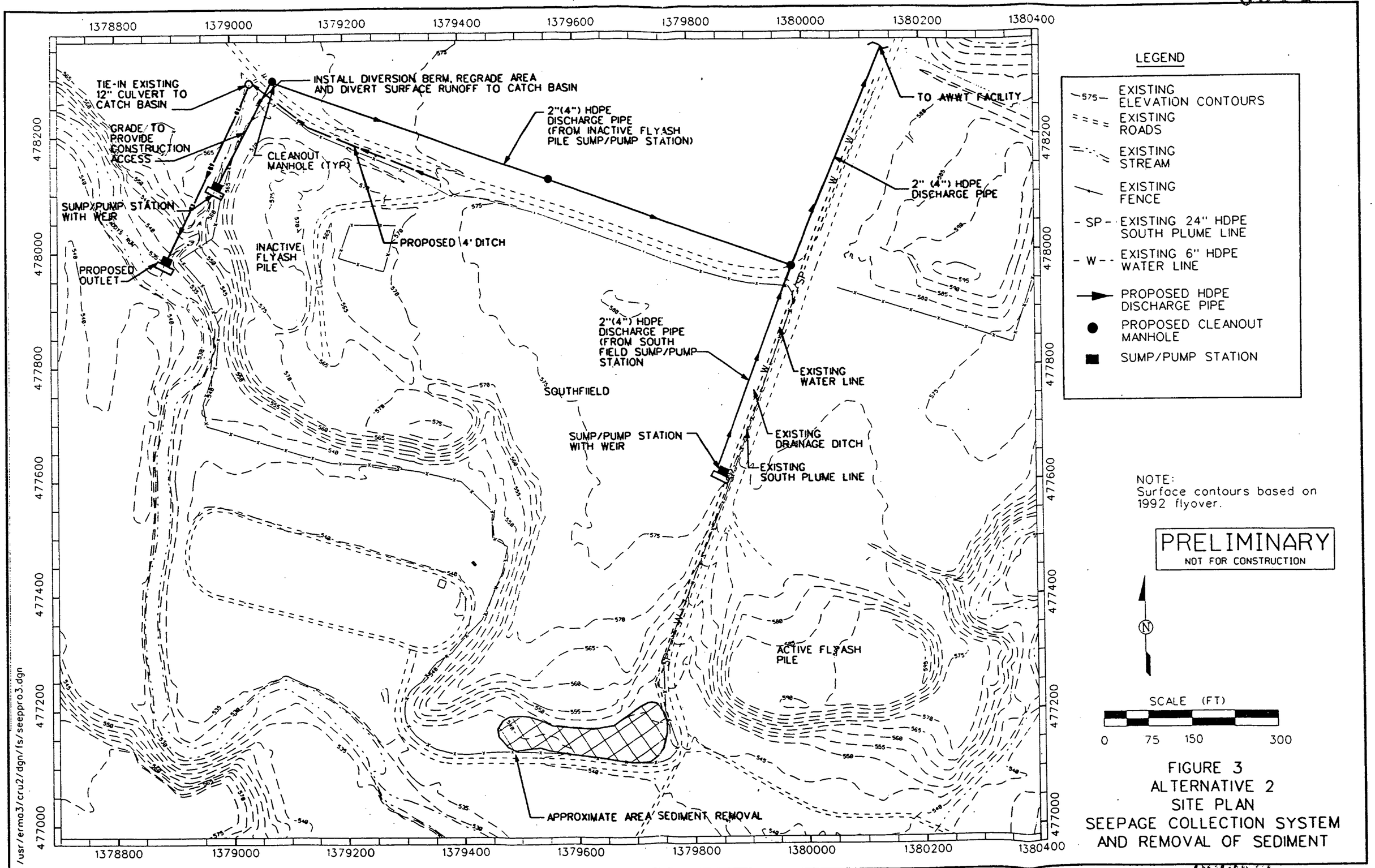
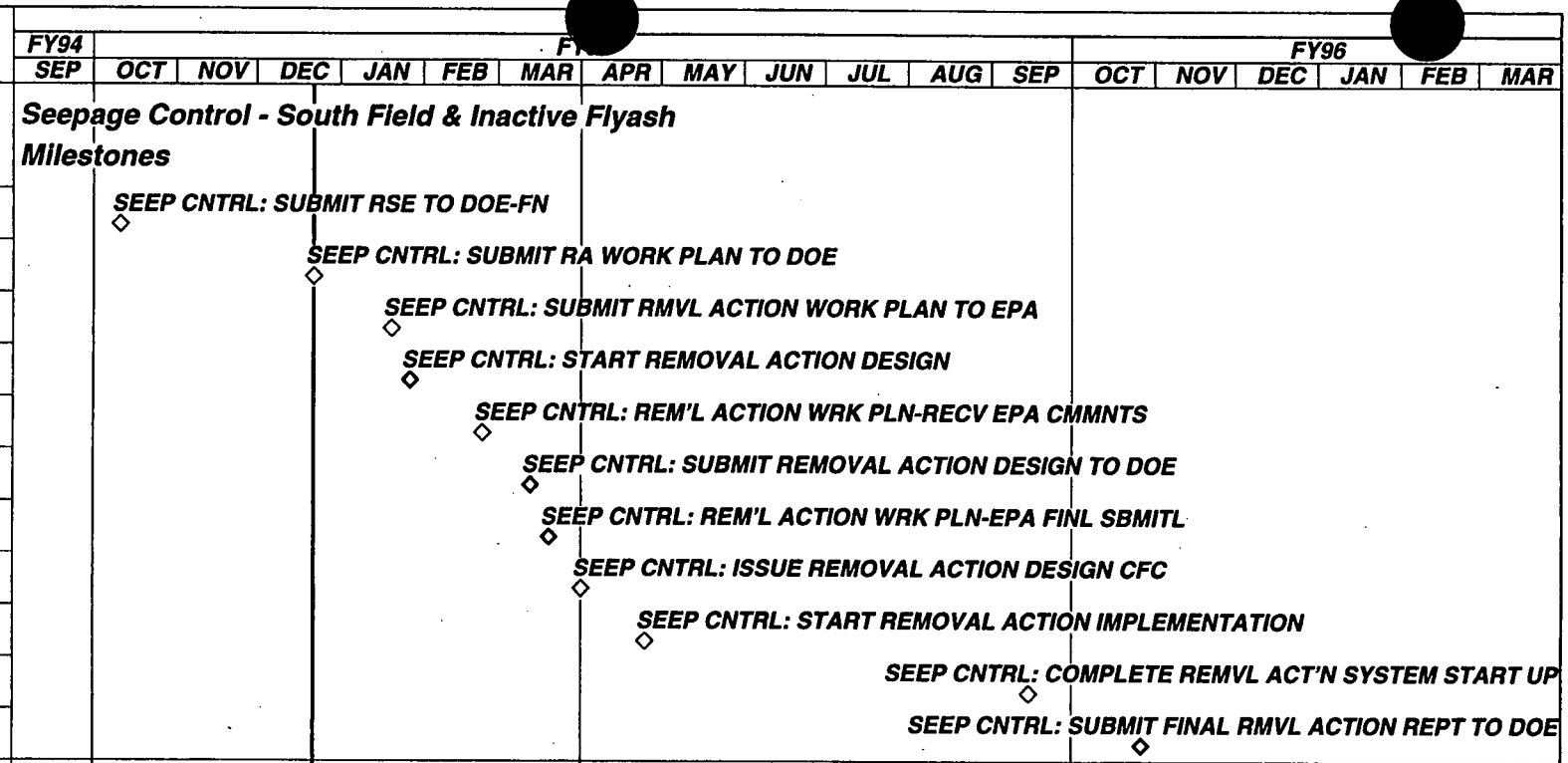


FIGURE 3
ALTERNATIVE 2
SITE PLAN
SEEPAGE COLLECTION SYSTEM
AND REMOVAL OF SEDIMENT

Attachment D

Bar Chart Schedule of Project Activities

EARLY START	EARLY FINISH	Activity
		Seepage Control - South Field & Inactive Flyash
		Milestones
11OCT94A		SEEP CNTRL: SUBMIT RSE TO DOE-FN
22DEC94		SEEP CNTRL: SUBMIT RA WORK PLAN TO DOE
20JAN95		SEEP CNTRL: SUBMIT RMVL ACTION WORK PLAN TO EPA
27JAN95		SEEP CNTRL: START REMOVAL ACTION DESIGN
23FEB95		SEEP CNTRL: REM'L ACTION WRK PLN-RECV EPA CMMNTS
13MAR95		SEEP CNTRL: SUBMIT REMOVAL ACTION DESIGN TO DOE
20MAR95		SEEP CNTRL: REM'L ACTION WRK PLN-EPA FINL SBMITL
	31MAR95	SEEP CNTRL: ISSUE REMOVAL ACTION DESIGN CFC
25APR95		SEEP CNTRL: START REMOVAL ACTION IMPLEMENTATION
	14SEP95	SEEP CNTRL: COMPLETE REMVL ACT'N SYSTEM START UP
	26OCT95	SEEP CNTRL: SUBMIT FINAL RMVL ACTION REPT TO DOE
15SEP94A	10OCT94A	SEEP CNTRL: Prep of Removal Site Eval'n (RSE)
21SEP94A	26SEP94A	SEEP CNTRL: Field Walkover Survey
10OCT94A	10OCT94A	SEEP CNTRL: Internal Review of (RSE)
11OCT94A	25OCT94A	SEEP CNTRL: DOE Review/Approval of RSE
18OCT94A	14DEC94A	SEEP CNTRL: Alternative Evaluation
26OCT94A	16DEC94A	SEEP CNTRL: Prepare RFP - Removal Action Design
2NOV94A	21DEC94A	SEEP CNTRL: Prepare Removal Action Work Plan
8NOV94A	10MAR95	SEEP CNTRL: NEPA & Cultural Resource Process
9NOV94A	26JAN95	SEEP CNTRL: Develop Health & Safety Plan



Plot Date 22DEC94
Data Date 22DEC94
Project Start 1JAN90
Project Finish 15SEP97

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

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Sheet 1 of 2

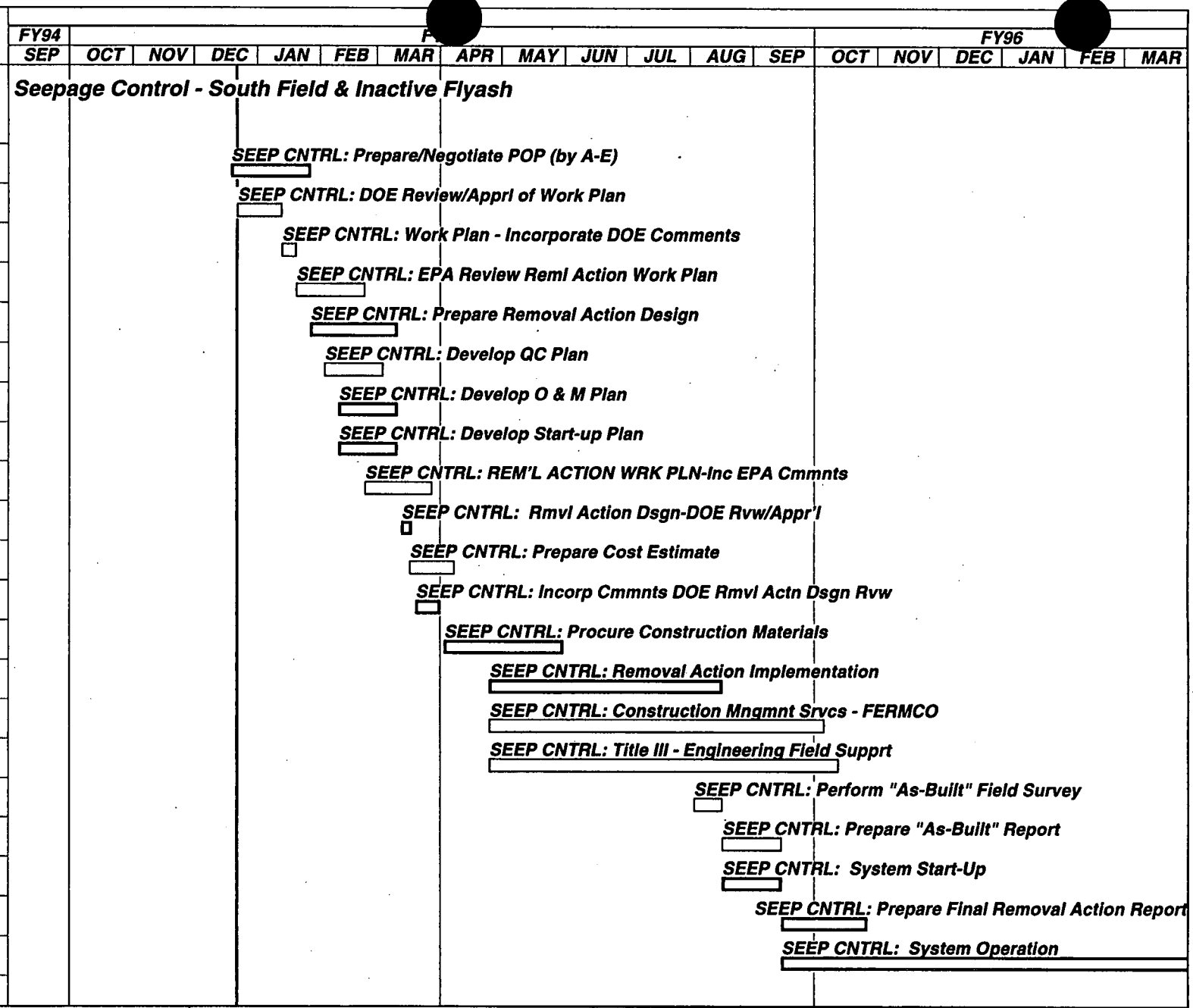
CURRENT SCHEDULE
CRU2 PROJECT CONTROLS
REMOVAL ACTION 30 WORK PLAN

2BSC BC-25

Date	Revision	Checked	Approved

Seepage Control - South Field & Inactive Flyash

EARLY START	EARLY FINISH	Activity
19DEC94A	26JAN95	SEEP CNTRL: Prepare/Negotiate POP (by A-E)
22DEC94	12JAN95	SEEP CNTRL: DOE Review/Apprl of Work Plan
13JAN95	19JAN95	SEEP CNTRL: Work Plan - Incorporate DOE Comments
20JAN95	22FEB95	SEEP CNTRL: EPA Review Reml Action Work Plan
27JAN95	10MAR95	SEEP CNTRL: Prepare Removal Action Design
3FEB95	3MAR95	SEEP CNTRL: Develop QC Plan
10FEB95	10MAR95	SEEP CNTRL: Develop O & M Plan
10FEB95	10MAR95	SEEP CNTRL: Develop Start-up Plan
23FEB95	27MAR95	SEEP CNTRL: REM'L ACTION WRK PLN-Inc EPA Cmmnts
13MAR95	17MAR95	SEEP CNTRL: Rmvl Action Dsgn-DOE Rvw/Appr'l
17MAR95	7APR95	SEEP CNTRL: Prepare Cost Estimate
20MAR95	31MAR95	SEEP CNTRL: Incorp Cmmnts DOE Rmvl Actn Dsgn Rvw
3APR95	30MAY95	SEEP CNTRL: Procure Construction Materials
25APR95	16AUG95	SEEP CNTRL: Removal Action Implementation
25APR95	5OCT95	SEEP CNTRL: Construction Mngmnt Srvcs - FERMCO
25APR95	12OCT95	SEEP CNTRL: Title III - Engineering Field Supprt
3AUG95	16AUG95	SEEP CNTRL: Perform "As-Built" Field Survey
17AUG95	14SEP95	SEEP CNTRL: Prepare "As-Built" Report
17AUG95	14SEP95	SEEP CNTRL: System Start-Up
15SEP95	26OCT95	SEEP CNTRL: Prepare Final Removal Action Report
15SEP95	15SEP97	SEEP CNTRL: System Operation



Plot Date 22DEC94
Data Date 22DEC94
Project Start 1JAN90
Project Finish 15SEP97

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

2BSC

Sheet 2 of 2

CURRENT SCHEDULE
CRU2 PROJECT CONTROLS
REMOVAL ACTION 30 WORK PLAN

2BSC BC-25

Date	Revision	Checked	Approved

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Attachment E

Health and Safety Plan

D

FERNALD ENVIRONMENTAL

RESTORATION MANAGEMENT CORPORATION

PROJECT SPECIFIC HEALTH AND SAFETY PLAN

R

FOR

REMOVAL ACTION NO. 31

FIELD ACTIVITIES

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A

JANUARY 1995

EMERGENCY PHONE: 738-**6511**

RADIO: **CONTROL**

F

APPROVAL:

Nancy Weatherup, Project Director CERCLA/RCRA Unit #2	Date
Daryl C. Mills, Manager Occupational Safety and Health Compliance	Date
Michael S. Davis, Health and Safety Manager CERCLA/RCRA Unit #2	Date

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LIST OF ATTACHMENTS

ATTACHMENT	TITLE
A	Project Specific Health and Safety Requirements Matrix
B	Personnel Environmental Monitoring Action Levels
C	FEMP Rally Points
D	Location of FEMP Medical Facility
E	Work Area Material Safety Data Sheets (MSDSs)
F	Work Area Maps
G	OSHA and DOE Employee Rights Poster
H	Acknowledgement Form

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1.0 INTRODUCTION

This Project Specific Health and Safety Plan (PSHSP) is for the installation of a Seepage and Sediment Control System for the South Field (SF) and Inactive Flyash Pile (IFP) located at the Fernald Environmental Management Project (FEMP).

The IFP is located south of the old production facility on the west side of the FEMP property. This area was a dumping ground until 1966 for flyash, building, and construction rubble. Some of the materials found in the IFP are:

Inorganic Chemicals	asbestos, arsenic, antimony, beryllium, copper, lead, molybdenum, selenium, and thallium*
Materials	flyash, construction rubble, nonprocess waste
Organic Chemicals	acetone, methylene chloride, and 1,1,1-trichloroethane*
Radiological	uranium, thorium and radium

* All chemicals listed are found in the flyash pile in low concentrations (parts per million [ppm]). The levels of chemicals found are not expected to cause an exposure hazard.

The SF is located adjacent to and around the IFP and there are reports of nonprocess waste buried in the SF area. Some of this waste, rubble, and debris contain low levels of radioactivity. Some of the materials located in the SF are:

Inorganic Chemicals	cadmium, beryllium, molybdenum, and asbestos.*
Materials	burned coal, coke, concrete, and flyash
Organic Chemicals	PAHs, PCBs, and dioxins
Radiological	uranium, thorium, and radium

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* All chemicals listed are found in the South Field in low concentrations (ppm). The levels of chemicals found are not expected to cause an exposure hazard.

Before entering the defined work area, all personnel shall be oriented on this PSHSP. In addition, all personnel will be required to be orientated on the Project Specific Health and Safety Requirements Matrix (PSHSRM). Personnel must sign an Acknowledgement Form (Attachment H) stating they understand the conditions of this plan. Fernald Environmental Restoration Management Corporation (FERMCO) Health and Safety personnel shall control the Acknowledgement Form.

1.1 PROJECT-SPECIFIC DESCRIPTION

The purpose of this project is to install a seepage collection system for rainwater from the SF and IFP and pump it back to the Advanced Wastewater Treatment Plant (AWWT) on site. Also part of this program is the removal of sediment from the southeast side of the SF and return it back to a predetermined location in the SF and buried to prevent future runoff.

The collection system will be sump pits, pumps, and discharge lines installed on the east side of the SF, as well as along the west side of the IFP by Paddys Run Creek.

1.2 WORK DESCRIPTION

The major task to be completed during the performance of this project are as follows:

- Laydown Area - Construct an area for storage of equipment, material, and a decontamination facility.
- Construct Project Access - Clearing and grub access to the sump/pump stations will need to be developed. This will include the sediment deposit at the southeast side of the SF.
- Excavate - Material removed from the sumps, lines excavated, and the sediment material will be removed and placed back on the SF.
- Install Sumps, Pumps, and Lines - Labor and material will be required to install two sumps, all the necessary connection piping, pumps, and electrical switch gear to install the recovery system.

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- Electrical - Electric supply will be delivered by pole from the existing substation located at the storm water basin, south of the west parking lot.

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2.0 ORGANIZATION STRUCTURE AND KEY PERSONNEL RESPONSIBILITIES

The following table shows key personnel, including primary and alternates, for performance of this project.

TITLE	PRIMARY	ALTERNATE
Manager, Occupational Safety and Health Compliance (OSHC)	Daryl Mills	Laurie Hagen
Manager, OSHC Technical Support	Laurie Hagen	Daryl Mills
Project Director, CRU2	Nancy Weatherup	Greg Jones
Project Manager, CRU2	Greg Jones	Uday Kumthekar
Health and Safety Manager, CRU2	Michael S. Davis	Laurie Hagen
Construction Manager, CRU2	D. Warren Hooper	Tom Daughtrey

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3.0 SITE CONTROL

Prior to mobilization and actual performance of project field activities, a walkdown of the location will be performed. Staff who participate in this walkdown include representatives for Industrial Hygiene (IH), Radiological Control, and the CRU2 Health and Safety Manager. During the location walkdown, any specific hazards not previously identified will be noted. During the project training, these hazards shall be emphasized and explained to field project staff. Field notes for this walkdown shall be retained in the project file with the PSHSP.

In addition, as part of the normal pre-project preparation activities, FEMP Standard Penetration Permits (PP) will be obtained for excavation and trenching for this project.

The PP will identify any subsurface features, such as buried utility, sewer, electrical, and other types of installed conduits which could negatively impact the project or create a safety hazard during performance of the field work.

A Radiation Work Permit will be issued for this project, and Rad Safety will do periodic monitoring of soil and equipment todetermine if a radiological problems exists. If a situation does arise, requiring controls greater than those already in place, all work will stop and the situation will be evaluated by the CRU2 Occupational Safety & Health (OS&H) Manager, Rad Engineering, and the CRU2 Project Manager.

3.1 WORK AREA REQUIREMENTS

At the beginning of each work day and prior to field staff departing into the field, the subcontractor supervisor will contact the Construction Logistics Department (Radio 517 phone number, 6489) and notify them of the area at the FEMP where the work is to be performed and the number of personnel at that location.

3.1.1 Radiological Concerns

Controlled perimeters of radiological areas are defined by yellow and magenta rope. All radiological areas will be identified by signs having the standard radiation symbol, the trefoil, on a yellow background.

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The SF is a Soil Contamination Area and has no special requirements for entry and/or exit. Contamination Areas may exist in the SF but they are not located in the proposed work areas.

Radiological control areas will be established around all excavations.

3.1.2 Exclusion Zones

An Exclusion Zone will be established around each major excavation. The Exclusion Zone shall have one ingress and egress point. Access to the Exclusion Zone will be limited to machine operators, project field management staff, and IH Technicians. Exclusion Zone barricades will consist of yellow caution tape. All other field activities, not directly related to the excavation, will be performed outside the Exclusion Zone boundary.

The Exclusion Zone is established to prevent unnecessary spread of radiological contamination. If the area is monitored and found to be radiologically clean, the exclusion zone will be established as a work control zone.

Whether it be for radiological control or to enter/exit a work area, at no time will employees cross over or under a barricade which is around an exclusion zone. The entrance/exit point is the only access to this area.

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4.0 TRAINING

The PSHSRM, produced in conjunction with the PSHSP, gives training, permitting, and other requirements for each task involved in the sampling project. This Matrix is included with this PSHSP as Attachment A. The minimum training required for this project is:

- Site GET
- Site Worker
- Rad Worker II
- 24 Hrs. Supervised Field Experience
- 8 Hr. Supervisor's Training for supervisors
- OSHA Out Reach training for supervisors
- Respirator training and fit test
- Orientation of PSHSP and Requirements Matrix
- Orientation on Project Specific MSDSs

4.1 HAZARD COMMUNICATION

4.1.1 Material Safety Data Sheets (MSDSs)

Employees will be trained on the contents of the MSDS. Each employee will review the MSDSs and will follow their stated requirements. For all products or chemicals to be used on the job by the subcontractor, MSDSs shall be provided to FERMCO (IH) (at least one week prior to their planned use) for review prior to the product or chemical arriving on site.

A complete set of MSDS sheets for all chemicals used on this project shall be maintained by the subcontractor in a central location that shall be posted on the FEMP property.

MSDSs for FEMP site materials, determined to present a hazard for work covered by this PSHSP, are included in Attachment E for use by the subcontractor to comply with the subcontractor's written Hazard Communication Program. Additional FEMP MSDSs are available through the IH Department.

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4.1.2 Job Briefings/Safety Meetings

All personnel involved in this project shall be given a job briefing (project training) prior to receiving authorization to begin work. The job briefing shall include review of this PSHSP. Also, personnel will be briefed on field activities prior to work commencement. In addition, Plan-of-the-Day meetings shall be held for all field staff at the beginning of each work day for the duration of this project. Safety concerns will be part of this meeting.

A job briefing shall be conducted for all field personnel. This meeting shall be conducted by the FERMCO Field Operations Manager.

NOTE: **All field personnel involved in this project shall attend all project training sessions.**

Written documentation of the briefings and safety meetings, in the form of attendance sheets, will be maintained and retained as part of the project permanent record. File copies of the documentation and attendance sheets shall be forwarded to the CRU2 Health and Safety Manager for review and record retention.

4.2 RECORDS

The acknowledgement Form, Attachment H of this plan, will be signed by all persons working on this project. This form will be kept with the Fiel Copy of the PHASP and at the end of the project will be turned in to the CRU2 Health and Safety Manager and filed with the project records.

Verification of project field staffs' attendance of all required Occupation Safety and Health Administration (OSHA), FEMP and FERMCO site training courses shall consist of employee training records on file with FERMCO Training Department, the FERMCO Medical Department, and the CRU2 and Environmental Division Training Coordinators, as applicable.

4.3 COMPETENT PERSON

A competent person will be required for the project if there are excavation that will be more than four feet deep and employees will be entering the excavation area to work. This competent person will be a representative of/for management and be trained to site and OSHA requirements

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on excavation and trenching. This person will be capable of identifying existing and predictable hazards and have the authority to correct any hazardous or unsafe conditions.

4.4 VISITORS

Anyone accessing the field sampling locations for the sole purpose of observation or viewing the field work in progress (hands-off inspections) is considered a "visitor." Visitors cannot operate any equipment, participate in the ongoing field activities, or supervise/oversee any fieldwork activity.

All visitors shall be oriented to the hazards of the site and the control measures through the same means as all other project personnel. Visitors who are required to enter the Exclusion Zone shall also be dressed in the same types of personal protective equipment (PPE) as the field operations staff.

Visitors will comply with the training requirements specified for the activities in progress. These requirements are specified on the PSHSRM, which is Attachment A.

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5.0 MEDICAL MONITORING AND SURVEILLANCE

5.1 REQUIREMENTS

All personnel engaged in the performance of project field activities and on site more than five days, are required to participate in the FEMP medical monitoring program. This program shall include in-vivo whole body monitoring.

5.2 RECORDS

The FERMCO Medical Services Department will maintain copies of all employee medical records.

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6.0 HAZARD ASSESSMENT

This section addresses the identified health and safety hazards associated with the conduct of field activities covered by this PSHSP.

Potential hazards to field sampling personnel may originate from the chemical, physical, radiological, biological, and safety hazards known or suspected to be present at the sampling locations.

6.1 RADIOLOGICAL ISSUES

Uranium can be found in the SF area. Precise concentrations and locations of uranium cannot be determined based on the information available at the time of preparation of this PSHSP.

Uranium is a radioactive material, and in its soluble forms, is highly toxic to the kidneys. Soluble uranium compounds are can be inhalation hazard as well as absorbed through the skin. Non-soluble forms of uranium are not absorbed through the skin, but constitute a radioactive inhalation hazard to the lungs.

6.2 INDUSTRIAL HYGIENE ISSUES

Based of RI soil and water data of the work areas associated with this project, the following volitale organic compounds and nonradiological inorganic chemicals are found in concentrations just above background (parts per million [ppm]).

acetone, methylene chloride, and 1,1,1-trichloroethane
asbestos, arsenic, antimony, beryllium, cadmium, copper, lead, molybdenum, selenium, and thallium

The levels of chemicals found are not expected to cause an exposure hazard.

6.2.1 Heat Stress

Heat stress may affect personnel performing activities with or without protective clothing when

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working in high ambient temperatures. Plenty of water, use of cooling devices, rest breaks and careful attention by the supervisor shall be used as control measures. Personnel shall become aware of symptoms of heat stress and be able to recognize these symptoms in oneself and in other workers. Symptoms of heat stress include: muscle cramps, fatigue, weakness, loss of coordination, nausea and in the later stages, hot dry skin (absence of sweating), delirium and seizures.

The FERMCO HSO, Subcontractor Health and Safety Officer or their designee shall review heat stress recognition and prevention at a regularly scheduled safety meeting.

When ambient temperatures exceed 80°F, FERMCO IH shall be contacted to review and/or add control measures to minimize heat stress (i.e., cool vests).

6.2.2 Biological Hazards

Biological hazards, which could potentially affect field workers, are limited to plants, insects, and animals. The following subsections describe the nature of the hazards.

Plants - Plant life which has the highest potential for affecting project field workers includes poison ivy, poison oak, and poison sumac. Staff will be briefed, during the project training sessions, on how to identify and avoid these plants. Any skin exposed to poisonous plants shall be washed as soon as possible following exposure. If the exposed body area does not respond to washing, or if the employee seems to display a hypersensitivity to poison exposure, then the employee will be sent to the FERMCO Medical Department for treatment and may be removed from the project.

Insects/Animals - A variety of insects, including ticks, mosquitos, bees, wasps, and chiggers are of concern at the project field sampling locations. As is well evidenced by human reactions to most insect bites or stings, reactions are usually limited to skin irritations which may range from mild to extreme. Many humans display a hypersensitivity to such exposures. However, in many instances it may be virtually impossible to anticipate the reaction of an affected individual until all the exposure has occurred.

In order to minimize the potential for health and safety related problems associated with insects, field staff will be instructed to:

- Wear FERMCO issued coveralls
- Avoid areas if high vegetation growth, if possible
- Avoid or minimize skin contact with any vegetation
- Avoid sitting on vegetation
- Use a manually operated weed cutter to clear the area prior to sampling, if necessary
- Avoid the use of personal hygienic strongly fragrant items such as deodorant, perfume, cologne, etc., as these items often attract some insects
- Employees can tape their coveralls at the ankles, if so desired, to control insects

Staff are free to use insect repellents, which are available through FERMCO Medical Services, and will be provided upon request.

6.3 SAFETY ISSUES

6.3.1 Physical Hazards

NOTE: All motorized vehicles and equipment will be inspected by the CRU2 OS&H Manager and/or the FERMCO Fire and Safety Inspector before starting work on site.

6.3.1.1 Stake Installation

Employees should beware of tripping hazards when walking over weed-covered and/or uneven ground. Also, employees should not hold location stakes as they are being driven, to avoid being struck by the driving hammer.

6.3.1.2 Lifting

Lifting is the most common task associated with lower back injury. Many of the injuries do not result from a single incident, but develop over a period of time. This type of injury may result from repetitive lifting. Personnel should know their lifting limits, and the object to be lifted should

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be limited by factors such as the route and distance to be traveled, the amount of time required, and the center of gravity necessary to handle the load safely.

At no time will an employee lift more than 50 pounds without assistance from another employee or mechanical device.

6.3.1.3 Sanitation

An adequate supply of potable water shall be provided at the work location. Containers used to dispense drinking water shall be capable of being tightly closed and equipped with a tap. Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

All drinking water locations, within a radiological controlled area, shall be reviewed by the FERMCO Radiological Control Department prior to use. Personnel shall be provided with a means of getting to site toilet facilities. Under no circumstances will any employee be physically located more than 5 minutes from toilet facilities.

If employee exposure to contaminants is suspected, an adequate supply of potable water will be available for their personal use.

6.3.1.4 Underground Utilities

All underground utilities will be identified during the acquisition of the Construction/Excavation/Penetration Permit.

6.3.1.5 Slips, Trips, and Falls

Always walk where you have a firm footing and take short steps in slippery places. Avoid carrying anything bulky that will obstruct vision. Look for falling, slipping, and tripping hazards such as cluttered traffic areas; unguarded openings and manholes; unsteady or snow- and ice-covered platforms; loose materials underfoot; tools hidden in the grass; and slippery, wet, oily, or worn walkways. Climbing over equipment to get other items and falling off/down steep slopes can cause serious and sometimes fatal accidents.

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All work paths and areas shall be kept clear of slip and trip hazards. If workers must work in or near areas where these hazards exist and the hazard cannot be removed, then proper barricades and signs shall be used to route personnel away from the hazards. Some common slip and trip hazards are mud, trash, electrical cords/airlines lying in walkways, and improperly stored equipment.

The Project Superintendent shall ensure that all personnel are afforded a clear walkway at all times. Exits and exit paths shall be maintained clear at all times.

6.3.1.6 Power Tools

Proper eye and face protection shall be provided and worn while using all hand and power tools. Inspect all tools before using. Do not use defective tools. Use tools only for the application for which they were designed. Every tool has a purpose. Do not use tools with mushroomed heads, sloppy connections, or broken handles. Use the proper strength tool for each job. The use of handle extensions or cheater bars is prohibited.

Disconnect tools and machines from their power source before making adjustments or attachment changes. Do not remove guards or safety devices. They are there for your protection. Ensure that blade guards are in place and working properly. Air-powered tools must have safety clips or retainers on all hose connections. Do not exceed manufacturer's safe operating pressure for all fitting.

Shut off all motorized equipment and let it cool sufficiently before refueling. when refueling equipment a portable fire extinguisher should be in the immediate area.

The CRU2 Health and Safety Officer shall inspect all tools on the job site. Tools found to be defective shall be tagged and removed from service.

6.3.1.7 Electrical Power

Ground Fault Circuit Interrupter (GFCIs) are required on all 15 and 20 ampere, 120 volt circuits, where hand or portable tools or equipment are used. The GFCI shall be placed at the source of the electrical service to protect both the cord and the devices connected.

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All flexible cords (extension cords) shall be approved (UL listed) cord sets and be of a type rated for hard usage and damp locations. All cords shall be ran routed to avoid damage from being on the ground.

6.3.1.8 Lock and Tag

All workers shall follow and be fully trained to the FEMP Energy Control Plan, if working with or under the control of an energy control isolation. Before commencing work on any energized system or circuit, a lockout is to be completed in accordance with Site Lock and Tag Procedures. All workers involved shall over-lock and tag the FERMCO Facility Owners lock and tag.

6.3.1.9 Excavation/Trenching

All excavation/trench work shall be accomplished using standards for safe working practices. These standards shall be the minimum level of personnel safety permitted for all work under the jurisdiction of FERMCO.

All excavations which may pose a hazard or are five (5) feet or more in depth, in which person(s) are to do work, shall be sloped to a minimum angle (34°) of repose of 1 : 1.5 to the base of the excavation or an approved method of shoring or shielding shall be used. All soils shall be classified as type "C" unless a registered professional engineer, whose field is soil mechanics, documents to IRS&T Safety Engineering a different soil class.

All soils, materials and equipment shall be maintained a minimum of two (2) feet from the edge of the excavation.

During work in a trench, personnel shall not be permitted underneath any loads handled by lifting or digging equipment.

Fugitive dusts from road traffic, storage areas, and construction activities shall be controlled to assure adequate visibility.

A flag person shall be provided when construction operations or equipment, on or adjacent to a roadway, creates a traffic hazard or otherwise restricts the normal flow of traffic.

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Where personnel are required to enter excavations over 4 feet in depth, sufficient stairs, ladders or ramps shall be provided to require no more than 25 feet lateral travel to reach. Any ladder or other similar device shall be secured in place.

Any excavation four (4) feet or more shall be evaluated for confined space hazards by FERMCO Industrial Hygiene (IH) prior to entry.

All excavation or trench work, within three (3) feet of any utility, shall be done by hand. No powered equipment is permitted.

Any underground installation/utility exposed by the excavation work shall be protected, supported, and/or removed to safeguard employees.

All excavations/trenches shall have barricades and/or guard rails installed to prevent falling into the depression.

Any walkway that crosses over a trench, posing a fall hazard, shall have the required railing and toeboards.

If shielding or pre-made shoring is used, a copy of the tabulated data which identifies the registered professional engineer who approved the data shall be maintained at the job site during it's use.

When shields (trench box) are used, the top must remain 18 inches above the soil setback.

Shoring by "screw jacks" shall requires tabulated data by a registered professional engineer, who has designed the use or system.

A competent person will be at the job site and shall be capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures

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to eliminate them and to have the "stop work authority". This person(s) shall be fully aware of all the excavation and trenching requirements.

Excavations shall be inspected prior to the start of work daily and, as needed, throughout the shift. Inspections shall be made after each rainstorm or other hazard increasing occurrence. All inspections shall be documented and maintained until the trench is backfilled or work is completed. All inspections shall be completed by a competent person.

6.3.3 Fire Protection

The potential for fires is nearly nonexistent. In addition to the potential for fire hazard from location access vehicles, the primary additional fire source is dry vegetation in the vicinity of the work site. Vehicle operators shall take care not to park vehicles in locations where potentially combustible materials could be ignited. Personnel will not be allowed to smoke in locations where potentially combustible materials could be ignited. All fuel powered cnstruction equipment used in support of this project will be equipped with portable fire extinguishers.

Flammable or combustible liquids, with a flash point of 140 degrees F or less (i.e., gasoline, diesel fuel, solvents, etc.), shall be handled in Factory Mutual Approved safety cans with operable flame arrester and self-closing lid(s). All safety cans shall be properly marked with the name of the liquid contents. A label identifying the hazard of the material shall be affixed to the container.

All areas where flammable liquids are stored shall have "NO SMOKING" signs posted and smoking shall not be permitted in the posted areas.

Other combustible materials, such as dirty disposable coveralls and scrap material, will be disposed of in accordance with established FERMCO waste disposal requirements.

Any burning, welding, or open flame will require open flame permit.

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7.0 HAZARD CONTROL

7.1 ENGINEERING CONTROLS

When needed, engineering controls will be used to control physical, chemical, and radiological hazards. Engineering controls anticipated to be used during the work, covered under this PSHSP, shall include:

- Establishment of work zones surrounding the work sites with entrance/exit points
- Support equipment to be located in one area
- Shoring or slping of trenches/excavations greater than five (5) feet

7.2 ADMINISTRATIVE CONTROLS

Administrative controls shall be the primary means of hazard control. Administrative controls shall include, but not be limited to:

- Project Specific Health and Safety Plan
- Project Specific Plan
- Standard operating procedures (SOPs)
- Site policy
- Limited ingress and egress to the work area
- Ensuring that only a Qualified Operator is assigned to operate the equipment
- Maintenance program for equipment
- Permits

7.3 PERSONAL PROTECTIVE EQUIPMENT/RESPIRATORY PROTECTION

The level of PPE and respiratory protection to be worn by field personnel performing project activities, is defined on an activity basis in the PSHSRM.

PPE typically used for field work at the determined level for this project includes steel toe safety boots, standard issue FERMCO work clothing optional, gloves, and safety glasses.

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Should conditions change and a subsequent change of PPE become necessary, changes will be made based on a review of specific hazards, weather, work conditions, operating requirements, and air monitoring at the work location. Additionally, protection may be upgraded as deemed appropriate by the CRU2 Health and Safety Manager or Designee, and Rad Engineer or the IH Technician within the constraints of this PSHSP. PPE may be downgraded by the CRU2 Health and Safety Manager upon consultation with Industrial Hygienists and Rad Engineering. With written approval of the CRU2 Health and Safety Manager, substitution of some PPE items may be appropriate. Approved written revisions will be made in the PSHSP.

The IH and Rad Technician, in addition to project personnel, shall be responsible for ensuring that all personnel are wearing the appropriate level of PPE for their respective work function.

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8.0 DECONTAMINATION

8.1 SITE DECONTAMINATION REQUIREMENTS

8.1.1 Personal

Site personnel are required to contact Radiological Control Technicians in the event of a personnel contamination incident. Detection of a count rate above background, with a portable GM monitoring instrument ("frisker"), should alert personnel of possible contamination. Ambient background count rate is not to exceed 300 counts per minute (CPM) in the location of the personnel monitoring. If background levels exceed 300 CPM, proceed to an area of lower background to perform the personal monitoring of the potentially contaminated individual . Ideal background levels would be less than 100 CPM.

8.1.2 Equipment

Equipment to be used for the project shall be decontaminated in accordance with the Project Specific Plan. Gross contamination will be removed and a subsequent radiological survey will be performed before transporting on any public or private roadway.

8.1.3 Eye Wash Station

An emergency eyewash station will be located in close proximity to the work site and all employees will be trained on proper use and location of this station. At no time will the eye wash station be located in a contamination zone, but will be located near the access point to the zone.

Project supervisor will inspect this station daily to ensure it is in working order and notify CRU2 Health and Safety Manager if there are any problems. The station will be stored during off working hours to prevent freezing.

9.0 EMERGENCY/CONTINGENCY PLANS

9.1 REPORTING

9.1.1 Emergency Numbers (Call numbers listed are for FERMCO **Frequency 2.**)

NAME	FEMP TELEPHONE NUMBER	RADIO
Ambulance	738-6511	CONTROL
Hospital	738-6511	CONTROL
Fire	738-6511	CONTROL
Security	738-6511	CONTROL
Emergency Response	738-6511	CONTROL
CRU2 Health & Safety Manager	738-6492	538
Industrial Hygiene	738-6207	357
Radiological Control 2nd and 3rd shift	738-6433/9244 738-6889	397/495/687
Fire and Safety Inspectors	738-6235	303
Assistant Emergency - Duty Officer (AEDO)	738-6295/6431	202
Accountability	738-6202	CONTROL
Construction Logistic Group	738-6489	517

9.1.2 Site Notification Procedures

All FEMP emergencies shall be reported to the FERMCO Communication Center to ensure rapid response. A means to report an emergency shall be available at all work locations whenever personnel are working. This may be accomplished by one of the following methods:

- Phone 738-**6511**
- Radio to "**Control**"

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Any injury, no matter how minor, shall be reported immediately to the FERMCO Medical Department for evaluation or treatment. The injured employee shall be accompanied to medical for evaluation and treatment by the employees supervisor or designee. The CRU2 Health and Safety Manager and the CRU2 Project Director, shall be notified as soon as possible after the injury/accident has occurred.

Employees working will be notified of emergency or abnormal conditions by the plant wide alarm system and radio announcements. This announcement follows the sounding of the site alarm horn signal (3-3s).

9.1.3 What to Report

The following are examples of emergencies that would justify calling and reporting an emergency:

- Serious injury
- Injury complicated by contamination
- Chemical/radiation release
- Chemical splash (eye and skin)
- Fire
- Major property damage
- Unusual occurrence(s)

When an emergency or abnormal condition is observed, personnel shall contact the FERMCO Communications Center at extension **6511** or via radio (**CONTROL**) for emergencies. **Stay on the phone line until the dispatcher hangs up.**

The following information **must** be given to the FERMCO Communications Center operator:

- Name and badge number
- Location where emergency has occurred
- Nature of the emergency
- Number of personnel with injuries

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- Unusual conditions (odors, symptoms, vapors, smoke)
- Current status of the emergency

9.2 EVACUATION ROUTES/ACCOUNTABILITY

9.2.1 Rally Point Accountability

Should a situation require an emergency evacuation of the work area, all equipment should be turned off (if possible) and left in place. All personnel should immediately proceed to the nearest established rally point (See Attachment C), which is Rally Point 2, located near the west side of the west parking lot. If field staff are not in close proximity to an established rally point, the field staff supervisor shall establish a rally point at an established location, of which all field staff will be made aware.

If the Rally Point is a location other than an established Rally Point, the site supervisor will contact Construction Logistics (Radio 517) when the locaiton of all employees are known. This should be accomplished as soon as possible.

9.2.2 In-Place Accountability

When in-place accountability is required, employees shall contact their supervisor and report their current position. The supervisor in charge shall report the names of any unaccounted personnel, Construction Logistics Group, and his or her management within 10 minutes.

9.3 EMERGENCY EQUIPMENT

9.3.1 FEMP Site Equipment

The FERMCO Medical Department is staffed and equipped to handle most types of medical emergencies that would occur during a task. The medical facility is staffed with Emergency Medical Technicians (EMTs) and is equipped with an ambulance to transport the injured person to the nearest off-site hospital, should extended or specialized treatment be necessary.

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The FERMCO Medical Department is located at the east end of the first floor of the ES&H Building (Building 53), see Attachment D. The location of the FERMCO Medical Department is shown on the map, which is Attachment D.

9.3.2 Work Area Equipment

Equipment for emergency eyewashing and minor fire suppression will be maintained at the work site. Specific locations will be determined by the CRU2 Health and Safety Manager for each work site and communicated to all project participants during the job briefing.

9.4 EMERGENCY RESPONSE

The FEMP Emergency Services will handle all on-site emergencies. Any request for emergency help should be requested by telephone at (738-) **6511** or on any FEMP radio frequency by calling **"CONTROL."**

9.4.1 Medical Emergencies

The FERMCO Medical department and emergency site ambulance shall serve as the first-aid responder, as they can respond within 3-4 minutes to FEMP site emergencies.

9.4.2 Fire Emergencies

All work sites shall maintain effective communication to summon fire fighting assistance. The nearest fire alarm will be activated, if available. If not available, other effected employees will be notified by alternate methods, such as radio, cellular phone, or voice. Access to the work area shall be maintained at all times to permit fire trucks and fire fighting crews to safely approach the fire emergency.

Only trained personnel shall attempt to operate fire fighting equipment and only when the fire is clearly within the capability of the fire fighting equipment. All vehicles are equipped with hand-operated fire extinguishers.

The FEMP Emergency Response Team (ERT) will also respond to all on-site fire emergencies. For any fire emergency at the FEMP, call (738-) **6511** or radio **"CONTROL"**.

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9.4.3 Explosion Emergencies

When an explosion has occurred the following actions are to be taken:

- Activate nearest fire alarm if possible or contact "Control" on the radio

NOTE: Other effected employees must be notified of a fire by alternate methods, such as radio, cellular phone, or voice if a fire alarm is not available.

9.4.4 Chemical Emergencies

9.4.4.1 Personal Contamination

Due to the limited nature of project field activities, equipment, and materials involved, personal contamination from either caustic or corrosive materials is highly unlikely. Should a contamination event occur, the affected area should be flushed with clean water using the portable eyewash/safety shower for a minimum of 15 minutes. The affected employee will then immediately report to the FERMCO Medical Department.

When personal contamination occurs from other than caustic or corrosive materials, IH will immediately be contacted. Remain at the work location until a representative of IH arrives and provides further instructions.

9.4.5 Radiological Emergencies

9.4.5.1 Releases

The Supervisor-in-charge, Assistant Emergency Duty Officer (AEDO), Radiological Control Technicians (RCT), and the CRU2 Health and Safety Manager shall be notified of the release.

9.4.6 Weather Limitations/Adverse Conditions

All employees should be aware that weather conditions can change rapidly and; therefore, be alert whenever threatening weather approaches the job site. When the weather alarm sounds, all work shall cease and employees will seek shelter in a sturdy structure until the storm passes. Any outside work will be suspended if warnings for high winds, lightning, or tornados are sounded.

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9.4.7 Accident Investigation

Any injury or accident shall require the supervisor to complete an accident report. This report shall be completed within 24 hours of the event and forwarded to the FERMCO Worker's Compensation Coordinator at site mail stop #31. Should a serious accident/injury occur, the involved area should not be disturbed until approved by the CRU2 Health and Safety Manager.

10.0 CHANGES/AMENDMENTS TO THE PSHSP

This PSHSP for CRU2 field activities is based on information available at the time of preparation. It is important that this plan be routinely reassessed by supervisors, project management, and the CRU2 Health and Safety Manager. In addition, unexpected conditions/events may arise which require reassessment of the health and safety issues. Downgrading of precautions, PPE, etc. identified in this plan must be approved in writing by the CRU2 Health and Safety Manager, or designee, following consultation with Industrial Hygienists or Radiological Engineers.

Unplanned operations and/or changes in work scope shall require a review and may require an amendment to the PSHSP. All amendments must be approved by the CRU2 Project Director, CRU2 Health and Safety Manager, and the OSHC Manager. These amendments must be controlled by ES&H Document Control.

10.1 CONTROL OF HEALTH AND SAFETY PLAN

For the purpose of ensuring that all personnel are informed of any changes in the scope of this PSHSP, CONTROLLED copies of this document shall be maintained by ES&H Document Control. Only essential personnel shall maintain controlled copies of this document. The following table is the list of personnel with the controlled copies of this PSHSP.

TITLE	INDIVIDUAL
Project Director, CRU2	Jim Williams
Health and Safety Manager, CRU2	Michael S. Davis
Radiological Control Technicians	Judy Hitt
Director FERMCO Medical Department	Doran Christensen
Manager, Industrial Hygiene Technicians	Jack Patrick
Manager, Industrial Hygiene	Dave Jackson
Project Manager	Greg Jones
CRU2 Document Control	Jeannie Rosser

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Changes, corrections, and/or additions not directed through ES&H Document Control will not be considered "controlled and approved." Operations conducted under such plans will be subject to work stoppage until control numbers are assigned.

10.2 REVIEW OF CONTENTS

This PSHSP will be reviewed at a frequency determined by the CRU2 Health and Safety Manager for currency and applicability to job tasks. The review shall be documented with a written memo to the Manager of OSHC. Revised pages will be submitted to ES&H Document Control for distribution.

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ATTACHMENT A

PROJECT-SPECIFIC HEALTH AND SAFETY REQUIREMENTS MATRIX

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The Project Specific Health and Safety Requirements Matrix will be developed when specific tasks are defined during detailed design.

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ATTACHMENT B

PERSONNEL ENVIRONMENTAL MONITORING ACTION LEVELS

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RADIOLOGICAL CONTROL ACTION LEVEL

MEASUREMENT	LEVEL	ACTION/RESPIRATORY PROTECTION NOTE 1,2,3
Alpha Probe	1000 dpm/100cm^2	Contact Radiological Control Technician @ ext. 6889.
Beta/Gamma Probe	1,000dpm/100cm^2	Contact Radiological Control Technician @ ext. 6889.
U-238, Th-230, and Th-232	> 0.10 x DAC note 4	Area posted as "Airborne Radioactivity Area"
U-238, Th-230, and Th-232	> 1.0 x DAC	Full-faced air purifying respirator with anti-C hood
U-238, Th-230, and Th-232	> 5.0 x DAC	Hooded air-supplied respirator
U-238, Th-230, and Th-232	> 10.0 x DAC	Contact Radiological Engineering
U-238, Th-230, and Th-232	> 40.0 x DAC	Invivo and/or Invitro sampling required by RC Dosimetry.
Rn-220	> 0.1 WL	Area posted as "Airborne Radioactivity Area"
Rn-220 daughters	< 0.25 Work Level (WL)	None
Rn-220 daughters	0.25 - 5.0 WL	Full-faced air purifying respirator (Hood required)
Rn-220 daughters	> 5.0 WL	Hooded air supplied respirator
Rn-222 daughters	> .033 WL	Area posted as "Airborne Radioactivity Area"
Rn-222 daughters	< 0.075 WL	None
Rn-222 daughters	0.075 - 1.65 WL	Full-faced air purifying respirator (Hood required)
Rn-222 daughters	> 1.65 - 33.0 WL	Hooded air-supplied respirator
Rn-222 daughters	> 33.0 WL	SCBA or air-supplied bubble suit

1.Area shall be posted as an **"Airborne Radioactivity Area"** at the discretion of the Radiological Control Technician.

2.Air sample results which indicate that individuals may have been exposed to 40 DAC-hours or more per week shall trigger internal dosimetry assessment (e.g. invitro and/or invivo assessments).

3.Invitro and/or invivo assessments may be required at levels less than 40 DAC-hours per week, if deemed necessary by the Radiological Control department.

4.Derived Air Concentrations (DAC) for radionuclide(s) of interest.

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INDUSTRIAL HYGIENE ACTION LEVELS

IH coverage is not required for this project.

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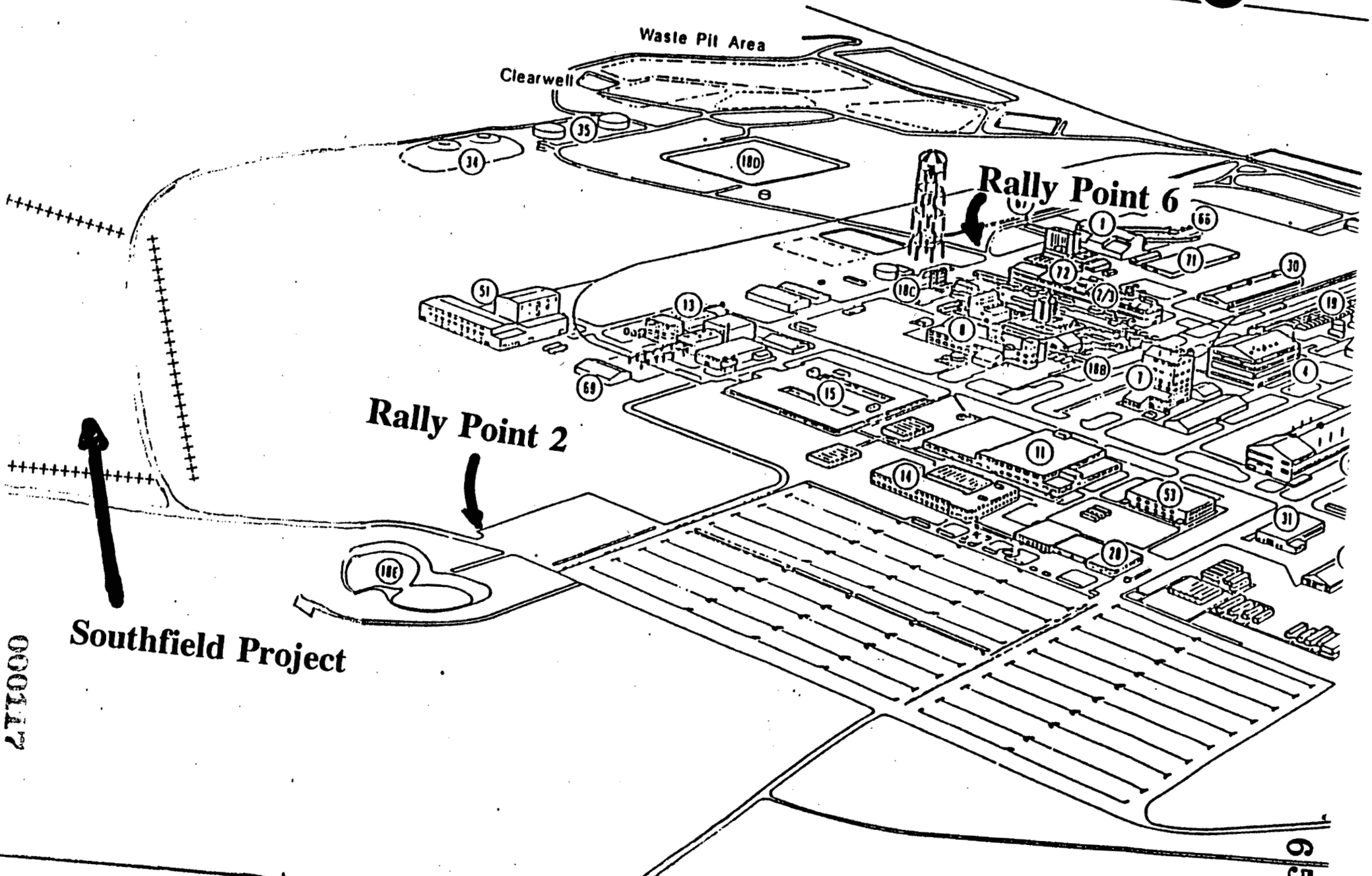
ATTACHMENT C

FEMP RALLY POINTS


Waste Pit Area
Clearwell
Rally Point 6
Rally Point 2
Southfield Project

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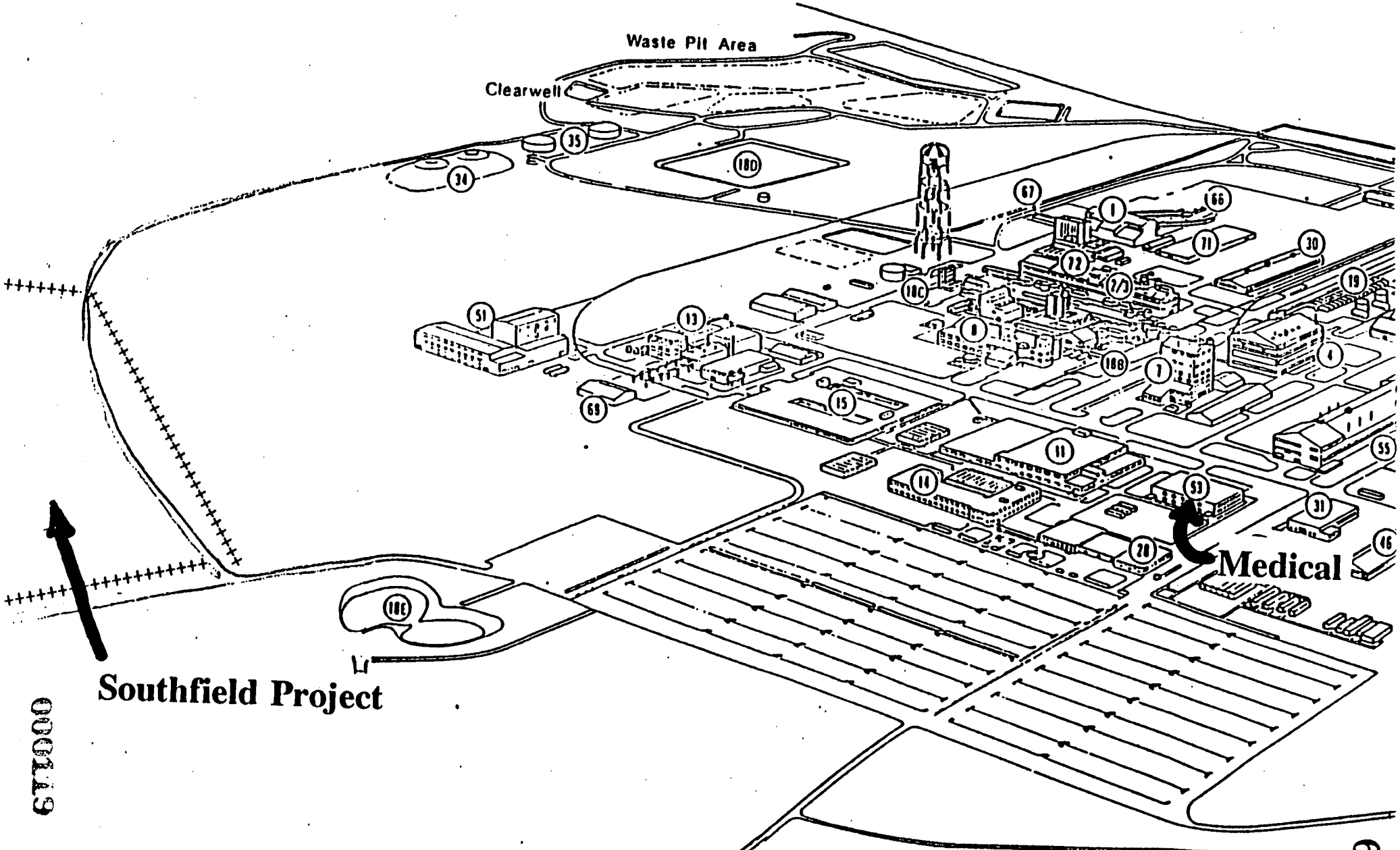
ATTACHMENT D

LOCATION OF FEMP MEDICAL FACILITY


Waste Pit Area
Clearwell
Medical
Southfield Project

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ATTACHMENT E

WORK AREA MATERIAL SAFETY DATA SHEETS (MSDSs)

Work Area MSDSs will be compiled during design.

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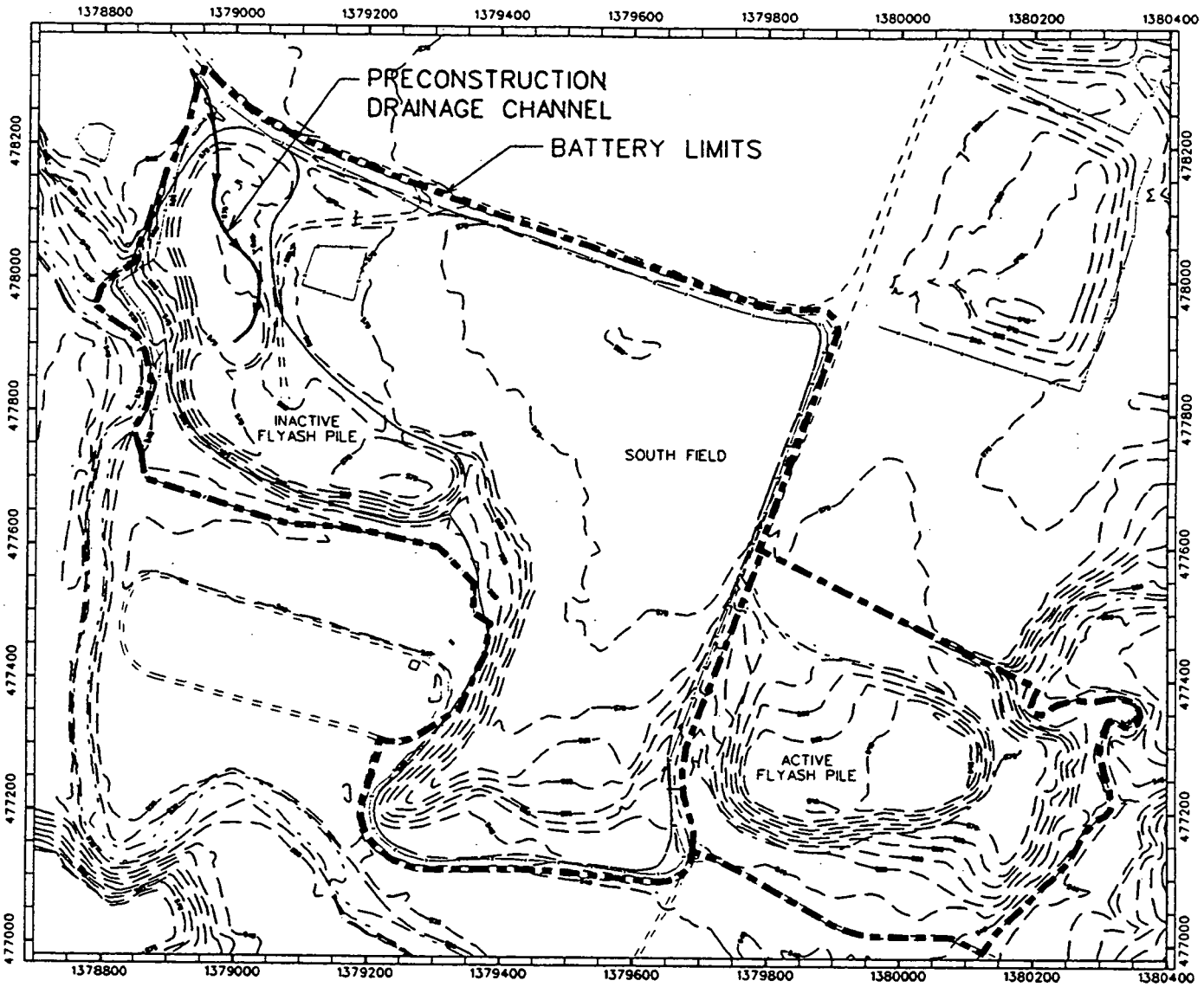
ATTACHMENT F

WORK AREA MAPS



LEGEND
- ELEVATION CONTOURS
- ROADS
- STREAM
- BATTERY LIMITS
- FENCE

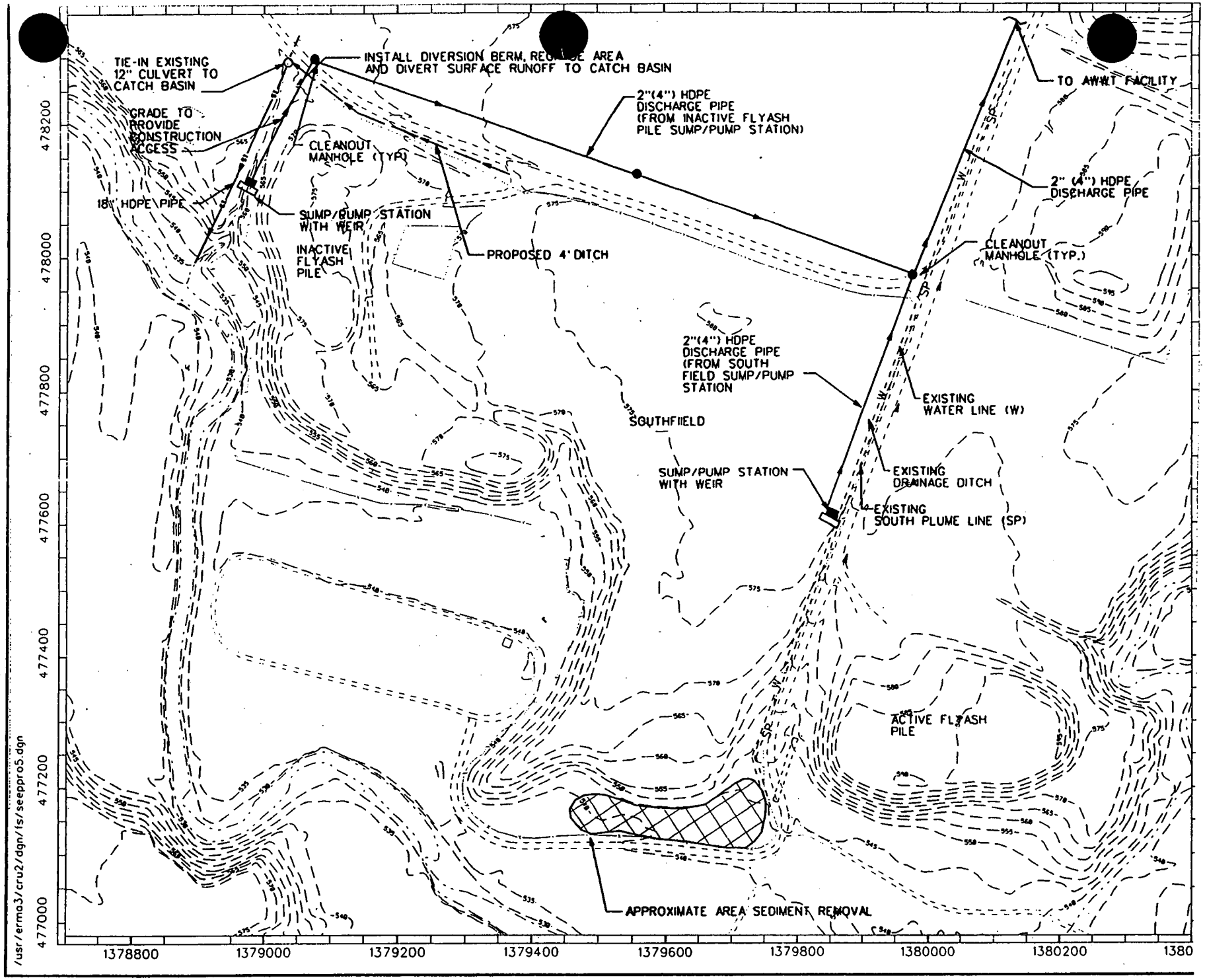
NOTE:
Coordinates are in State Planar NAD 1927.
Surface contours based on 1992 flyover.

N

SCALE (FT)
0 250 500

TOPOGRAPHY OF THE
SOUTH FIELD AND FLYASH PILES

fs010.dgn


TIE-IN EXISTING 12" CULVERT TO CATCH BASIN
INSTALL DIVERSION BERM, REGRADE AREA AND DIVERT SURFACE RUNOFF TO CATCH BASIN
TO AWWT FACILITY
GRADE TO PROVIDE CONSTRUCTION ACCESS
2"(4") HDPE DISCHARGE PIPE (FROM INACTIVE FLYASH PILE SUMP/PUMP STATION)
CLEANOUT MANHOLE (TYP)
2" (4") HDPE DISCHARGE PIPE
18" HDPE PIPE
SUMP/PUMP STATION WITH WEIR
CLEANOUT MANHOLE (TYP.)
INACTIVE FLYASH PILE
PROPOSED 4' DITCH
2"(4") HDPE DISCHARGE PIPE (FROM SOUTH FIELD SUMP/PUMP STATION
EXISTING WATER LINE (W)
SOUTHFIELD
SUMP/PUMP STATION WITH WEIR
EXISTING DRAINAGE DITCH
EXISTING SOUTH PLUME LINE (SP)
ACTIVE FLYASH PILE
APPROXIMATE AREA SEDIMENT REMOVAL
478200
478000
477800
477600
477400
477200
477000
1378800
1379000
1379200
1379400
1379600
1379800
1380000
1380200
/usr/erma3/cru2/dgn/ts/seeppro5.dgn

6514

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ATTACHMENT G

OSHA AND DOE EMPLOYEE RIGHTS POSTER

Occupational Safety and Health Protection for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities

Policy:

U.S. Department of Energy (DOE) contractor employees shall be provided with safe and healthful working conditions in accordance with the standards prescribed pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, and the Department of Energy Organization Act of 1977; said standards shall be consistent with those promulgated under the *Occupational Safety and Health Act of 1970*, Public Law 91-596. Please refer to the Order DOE 5483.1A for details.

DOE Contractors:

DOE has determined that Fernald Environmental Restoration Management Corporation is subject to DOE Acquisition Regulation (DEAR), Subpart 970.23, and is, therefore, required to comply with applicable DOE-prescribed Occupational Safety and Health Administration (OSHA) standards listed therein. This Order and the standards are available for employee review at Safety & Health Building #53

As delineated by the Order DOE 5483.1A, the DOE contractor is required to:

1. Furnish to employees, employment and a place of employment which are as free from occupational safety and health hazards as possible.

2. Establish and implement programs and procedures to comply with the Order DOE 5483.1A. These shall include programs and procedures to monitor the workplace for known toxic materials and harmful physical agents which are used or produced at the facility, and maintain records of the data. As part of these programs and procedures:

(a) Advise employees or their representatives that they are to be provided with an opportunity to (1) observe monitoring or measuring for toxic materials or harmful physical agents, and (2) have access to the results thereof.

*(b) Provide to each employee, former employee, or designated representative, within 15 days of the receipt of a written request, access to or copies of any monitoring or bioassay records relevant to the employee's potential exposure to toxic materials or harmful physical agents during employment.

(c) Notify employees promptly of any information indicating that an exposure to toxic materials or harmful physical agents may have exceeded the limits specified by the DOE-prescribed OSHA standards.

*(d) Provide to each employee, former employee, or designated representative, within 15 days of the receipt of a written request, access to or copies of the employee's cumulative recorded occupational radiation dose during employment.

(e) Notify employees promptly of any information indicating that a radiation dose may have exceeded the limits specified by the DOE-prescribed OSHA standards.

*For purposes of access to an employee's monitoring, bioassay, or radiation exposure records, if the representative is not the recognized/certified collective bargaining agent, then he or she must have the employee's written authorization for such access.

Employees:

All employees are required to:

1. Observe the DOE-prescribed OSHA standards applicable to their work.

2. Report promptly to the contractor any condition which may lead to a violation of these standards.

3. Respond to warning signals which may be activated in the event of fire, radiation, or other possible emergencies.

4. Report emergencies using established procedures.

Inspections:

All activities under this contract are subject to inspection by DOE. When an inspection under the Order DOE 5483.1A is conducted, a contractor management representative and a representative authorized by the employees will be given an opportunity to accompany the DOE inspector.

Where there is no representative authorized by the employees, the DOE inspector will consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaints:

Employees may file a complaint with the contractor management or with the local DOE office using the form DOE F 5480.4 to request an inspection of the workplace. Complaints also may be filed by letter, telegram, or oral means. DOE F 5480.4 is available from Near the south entrance of the cafeteria

When an employee requests anonymity from the contractor, DOE shall honor this request.

Imminent Danger

For any condition or practice which presents an immediate hazard that could reasonably be expected to cause death or serious physical harm (permanent or prolonged impairment of the body or temporary disablement requiring hospitalization), the contractor and/or DOE shall take immediate and effective remedial actions to remove employees from the hazard and/or eliminate the hazard. As soon as possible, an inspection shall be conducted by the contractor and/or DOE to assure that appropriate actions have been taken to preclude recurrence of the hazard.

Nondiscrimination:

No contractor shall discharge or in any manner discriminate against any employee by virtue of the filing of a complaint, or in any other fashion exercising on behalf of himself or herself or others any action set forth in the Order DOE 5483.1A.

Inquiries:

Inquiries should be addressed to the contractor; however, additional inquiries may be addressed to the following local DOE official.

Acting Manager
DOE Field Office, Fernald
P. O. Box 398705
Cincinnati, OH 45239-8705

Posting Requirements:

Copies of this notice must be posted in a sufficient number of places in Government-owned plants and facilities operated by DOE contractors subject to DOE Acquisition Regulation (DEAR), Subpart 970.23, to permit employees working in or frequenting any portion of the plant to observe a copy on the way to or from their workplace.

U.S. Department of Energy

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ATTACHMENT H

ACKNOWLEDGEMENT FORM

ACKNOWLEDGEMENT STATEMENT

NAME (printed)	SIGNATURE	DATE

Attachment F

Safety Analysis

Attachment F
Safety Analysis

A request for safety assessment was submitted to the FERMCO Safety Analysis Division. For this project, the request form was designated to serve as the safety assessment and no further analysis or documentation was deemed to be necessary. A copy of the request form is presented on the following pages.

REQUEST FOR SAFETY ASSESSMENT

DATE: 12/9/94

TO: Manager, Nuclear & System Safety

FROM: Gregary N. Jones

REQUEST THAT A SAFETY ASSESSMENT BE PREPARED FOR THE FOLLOWING PROJECT:

PROJECT TITLE: Removal Action 30: Seepage Control at the South Field and Inactive Flyash Pile

PROJECT NUMBER: 2BSC1

DATE REQUIRED: 12/17/94

PROJECT DESCRIPTION: (PROVIDE A BRIEF DESCRIPTION AND/OR ATTACH DOCUMENTATION DESCRIBING THE PROJECT)

Removal Action No. 30 will consist of five main activities as follows:

- Installation of a weir/sump with water level activated pump located in the drainage ditch at the South Field.
- Installation of a weir/sump with water level activated pump in the drainage ditch at the Inactive Flyash Pile.
- Construction of a piping system to convey water from the two pump systems to the South Plume pipeline.
- Installation of electrical lines from vicinity of the retention basin to the South Field and Inactive Flyash Pile areas in order to supply electricity to the two pumps.
- Excavation of the top 1.5 feet of sediment from the southeast corner of the South Field and transport of that material to a controlled stockpile.

The seepage and surface runoff collected in the sumps would be pumped to the AWWT Facility via the South Plume pipeline. The pumps (anticipated to be approximately 25 gpm each) would be activated by water level controls installed in the sump. The pump would be activated by a high level control and deactivated by a low level control. During rainfall events that produce flow rates greater than that which can be handled by the sump pump, runoff will spill over the weir and drain downstream. Sediment would be trapped in the sump and routinely removed. The drainage ditches will be regraded and reseeded where disturbed by the installation of the weirs/sumps.

SIGNATURE OF REQUESTER: Gregary N. Jones

REQUEST FOR SAFETY ASSESSMENT

(This section to be filled in by Manager, Nuclear and System Safety)

SAFETY ASSESSMENT IDENTIFICATION NUMBER:	
FERMCO:RP:(SARA):94-0062	☐ The request to provide a Safety Assessment by 12/17/94 is accepted; the individual assigned to the project is: Name: Ronald J. Bartos Phone No.: 738-9369

☒ An assessment has been performed for the project described in this request and this form will serve as the Safety Assessment document. Based on the information provided with this request for Safety Assessment, no further analysis or documentation is required because this project:

☐ does not introduce or involve hazards not routinely encountered in industry and accepted by the public.

RATIONALE:
*(See NOTE below)

Standard Industrial Hazards will be controlled through OSHA compliance and implementation of the HASP.

Personnel exposure to radiologically contaminated soil and water will be controlled by PPE.

☐ is of a type specifically excluded from requiring a Safety Analysis Report by DOE Letter "Streamlining the Safety Documentation Process" (C. C. Hawkins, 10/9/79).

RATIONALE:
*(See NOTE below)

SIGNATURE OF MANAGER, NUCLEAR AND SYSTEM SAFETY:	DATE:
[signature] 12/14/94	12-16-94

*NOTE: *If either rationale above is employed to conclude that further Safety Analysis Documentation is unnecessary, approval by the Manager, Regulatory Compliance, and the appropriate Technical Department Level-III Manager is required.*

[redacted]	[redacted]

SIGNATURE OF TECHNICAL DEPARTMENT SECTION MANAGER:	DATE:
[signature]	12/20/94

Attachment G

Identification of ARARs

ATTACHMENT G

TABLE G-1
CHEMICAL-SPECIFIC REQUIREMENTS

Statute/ Regulation	Title	ARAR Category	Requirement Summary	Application to Removal Action
DOE Order 5820.2A Chapter III (3)(a)(2)	Radioactive Waste Management	TBC	Concentrations of radioactive material which may be released to the general environment in surface waste, ground water, soil, plants or animals must not result in an effective dose equivalent that exceeds 25 mrems per year to any member of the public.	Radiation levels to the public must be controlled during all phases of the removal action.
DOE Order 5400.5 Chapter II (1)(a)	Radiation Protection of the Public and the Environment	TBC	The exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, in a year, an effective dose equivalent greater than 100 mrem.	Radiation levels to the public must be controlled during all phases of the removal action.
40 CFR §61.92, 61.93.	National Emission Standards for Hazardous Air Pollutants	Applicable	Emissions of radionuclides (except radon-220 and radon-222) to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem per year.	Air emissions must be controlled during construction.
40 CFR §192.02(b)	Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings	Relevant and Appropriate	Controls shall be designed to provide reasonable assurance that releases of radon-222 to the atmosphere will not exceed an average release rate of 20 pCi/m^{2}s or increase the annual average concentration of radon-222 in air or above any location outside the disposal site by more than 0.5 pCi/L.	Air emissions must be controlled during construction.

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TABLE G-2
ACTION-SPECIFIC REQUIREMENTS

Statute/ Regulation	Title	ARAR Category	Requirement Summary	Application to Removal Action
DOE Order 5400.5 Chapter I (4) and Chapter II (2)	Radiation Protection of the Public and the Environment	TBC	The order adopts the ALARA process in planning and carrying out all DOE activities. ALARA requires judgement with respect to what is reasonably achievable.	The ALARA process must be incorporated into the planning and implementation of the removal action.
OAC 3745-17-07 (B)(5),(6)	Ohio Emissions of Particulate Matter	Applicable	There shall be no visible particulate emissions from any unpaved roadway, parking area, or material storage piles except for a period of time not to exceed 13 minutes during any 60-minute observation period.	Particulate emissions must be controlled during construction.
OAC 3745-17-08	Ohio Emissions of Particulate Matter	Relevant and Appropriate	No person shall cause or permit any fugitive dust source to be operated; or any materials to be handled, transported or stored; or a road to be used, constructed, altered, repaired, or demolished without taking or installing reasonably available control measures to prevent fugitive dust from becoming airborne.	Fugitive dust emissions must be controlled during construction.

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TABLE G-3
LOCATION-SPECIFIC REQUIREMENTS

Statute/ Regulation	Title	ARAR Category	Requirement Summary	Application to Removal Action
40 CFR §6.302(h)	Procedures for Implementing the National Environmental Policy Act	Applicable	All Federal agencies must insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the constituent elements essential to the conservation of a listed species within a defined critical habitat.	Federal endangered or threatened animals and plants must be protected during the removal action.
50 CFR §17.21, §17.94	Endangered and Threatened Wildlife and Plants			
50 CFR §402.01	Interagency Cooperation-Endangered Species Act			
ORC 1531.25	Ohio Endangered Species Regulations	Applicable	No person shall take or possess any native species of wild animal, or and eggs or offspring thereof, that is threatened with state-wide extinction.	Surveys have identified one state-listed threatened animal [Sloan's crayfish (*Orconectes sloanii*)] in Paddys Run that must be protected during the removal action.
16 U.S.C §470	National Historic Preservation Act			
40 CFR §6.301 (c)	Procedures for Implementing the National Environmental Policy Act	Applicable	No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands unless such activity is pursuant to a permit.	Arheological and cultural resources must be protected during the removal action. The area included in the removal action has been previously disturbed so a cultural resources survey does not need to be completed.

TABLE G-3
(continued)

Statute/ Regulation	Title	ARAR Category	Requirement Summary	Application to Removal Action
40 CFR §6.302 (b)	Procedures for Implementing the National Environmental Policy Act	Applicable	Federal agencies must evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain.	The southern portion of the South Field and the western boundary of the Inactive Flyash Pile are located in a floodplain. Because certain activities associated with the removal action take place in a floodplain, all assessment and notification requirements must be followed.
10 CFR §1022.3	DOE Compliance with Floodplain/Wetlands Environmental Review Requirements	Applicable	DOE shall avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and avoid direct and indirect support of floodplain development wherever there is a practicable alternative. DOE shall incorporate floodplain management goals into its planning, regulatory, and decision-making processes. DOE shall undertake a careful evaluation of the potential effects of any DOE action taken in a floodplain. DOE shall identify, evaluate, and as appropriate, implement alternative actions which may avoid or mitigate adverse floodplain impacts. DOE shall provide opportunity for early public review of any plans or proposals for actions in floodplains.	The southern portion of the South Field and the western boundary of the Inactive Flyash Pile are located in a floodplain. Because certain activities associated with the removal action take place in a floodplain, all assessment and notification requirements must be followed.
10 CFR §1022.15 (a)	DOE Compliance with Floodplain/Wetlands Environmental Review Requirements	Applicable	If DOE finds that no practicable alternative to locating in the floodplain is available, consistent with the policy set forth in Executive Order 11988, DOE shall, prior to taking action, design, or modify its action in order to minimize potential harm to or within the floodplain.	The southern portion of the South Field and the western boundary of the Inactive Flyash Pile are located in a floodplain. Harm to the floodplain must be minimized.

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H

Attachment H

Floodplain Assessment

Work Plan - RA No. 31
FEMP-OU02-02 DRAFT
Januarry 20, 1995

FLOODPLAIN ASSESSMENT FOR SEEPAGE CONTROL AT THE SOUTH FIELD AND INACTIVE FLYASH PILE

REMOVAL ACTION No. 31

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LIST OF ACRONYMS

ac	acre(s)
CFR	Code of Federal Regulations
DOE	U.S Department of Energy
FEMP	Fernald Environmental Management Project
FS/PP-EA	Feasibility Study/Proposed Plan-Environmental Assessment
ft	foot/feet
ha	hectare(s)
m	meter(s)
MSL	mean sea level
RA31	Removal Action No. 31

H.1.0 INTRODUCTION

The Fernald Environmental Management Project (FEMP) is divided into five operable units. The subject of this Floodplain Assessment is Operable Unit 2, which consists of five waste areas: the Solid Waste Landfill, Lime Sludge Ponds, Inactive Flyash Pile, South Field, and Active Flyash Pile.

The purpose of Removal Action No. 31 (RA 31) for Operable Unit 2 is to protect human health and the environment from the seeps and sediments in the Inactive Flyash Pile and South Field by implementing an interim solution that will fit into the final remediation of Operable Unit 2.

Executive Order 11988 (Protection of Floodplains), which is implemented by U.S. Department of Energy (DOE) Regulation 10 Code of Federal Regulations (CFR) 1022, "Compliance with Floodplain/Wetlands Environmental Review Requirements," specifies the requirement for a floodplain assessment in cases where DOE is responsible for providing federally undertaken, financed, or assisted construction and improvements that may impact floodplains (DOE 1979). Pursuant to 10 CFR 1022.11, the DOE has determined that a Floodplain Assessment will be prepared for RA No. 31. A Floodplain Notice of Involvement will be issued in the Federal Register to satisfy the public notice requirements of 10 CFR 1022.14 and the appropriate floodplain statement of findings will be prepared.

H.2.0 PURPOSE AND NEED

The Operable Unit 2 Remedial Action is currently scheduled to begin in 1997. The activities that take place under RA 31 will reduce the amount of contamination entering the groundwater during the time prior to full implementation of the remedial action. The proposed removal action will require activities on site that could impact the floodplain. Therefore, DOE is preparing this Floodplain Assessment.

H.3.0 DESCRIPTION OF THE PROPOSED ACTION

RA No. 31 will be implemented as an interim solution and initiated within six months. The proposed action includes the construction of a collection system to collect contaminated seepage which would otherwise infiltrate into the Great Miami Aquifer and the removal of contaminated sediment in the low area of the southeast corner of the South Field to prevent leaching of contaminants into the Great Miami Aquifer. Along the west side of the Inactive Flyash Pile, the existing drainage ditch would be rerouted and the existing culvert would be extended to reduce stormwater flow and minimize overflow of the sump. Collected seepage and runoff (from the initial portion of storm events) would be sent to the Advanced Wastewater Treatement facility.

H.4.0 FLOODPLAIN EFFECTS

H.4.1 FLOODPLAINS

Floodplains within the FEMP site property are confined to the north-south corridor containing Paddys Run, which has also been designated as a water of the United States and the State of Ohio (Figure H.4-1). Note that areas north of the main rail spur and south of Willey Road were not studied. Outside the boundaries of the FEMP site, the 100- and 500-year floodplain of the Great Miami River extends west of the "Big Bend" area and northward along Paddys Run from the confluence of the two streams past the southern boundary of the FEMP site (Figure H.4-2). Elevations range from 165 meters (m) [542 feet (ft)] mean sea level (MSL) at the southern boundary of the floodplain studied to 173 m (567 ft) MSL at the northern tip (Figure H.4-1).

H.4.1.1 Floodplains Adjacent to Operable Unit 2

A study by Parsons (1993) examined the 100- and 500-year floodplain along Paddys Run. The results of this study predicted a 100-year flood flow of approximately 316 cubic meters per second (11,150 cubic feet per second). In the vicinity of the Inactive Flyash Pile, that flow was estimated to yield an elevation of 546 ft MSL.

H.4.1.2 Floodplain Impacts

Removal activities involving the Inactive Flyash Pile and the South Field would have potential impacts on approximately 0.28 hectare (ha) [0.70 acre (ac)] of the floodplain (Table H.4-1). Direct impacts to the floodplain would result from the excavation of contaminated sediments within the floodplain (in the low area in the southeast corner of the South Field) and heavy equipment operating in the floodplain during the construction of a sump/pump station and a portion of the discharge line. However, this physical impact would be temporary and would not be expected to cause any permanent alterations. Any change in flood elevations would be minimal.

Potential indirect impacts as a result of excavation and construction activities involving the Inactive Flyash Pile and South Field include surface water runoff and sedimentation loading into the floodplain. Measures to minimize or eliminate these potential adverse impacts may include the utilization of silt fences and straw bales. In summary, excavation and construction activities would result in short-term impacts to the floodplain; however, no adverse long-term impacts would be expected. Additionally, the impacts identified in this Assessment have already been qualitatively identified in the Floodplain Assessment prepared for the Operable Unit 2 (Feasibility Study/Proposed Plan - Environmental Assessment (FS/PP-EA).

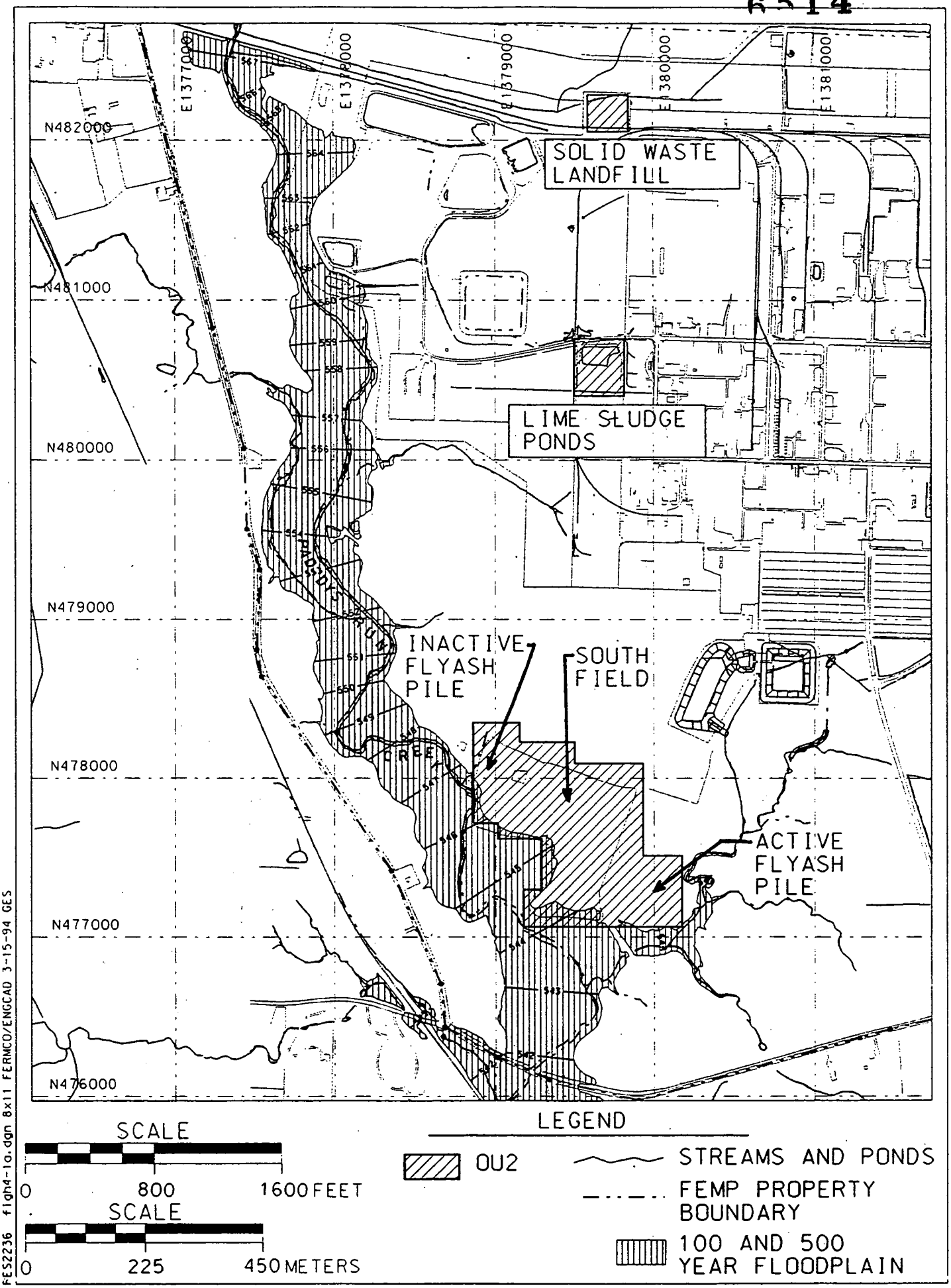

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FIGURE H.4-1 PADDYS RUN CREEK 100 AND 500 YEAR FLOODPLAIN

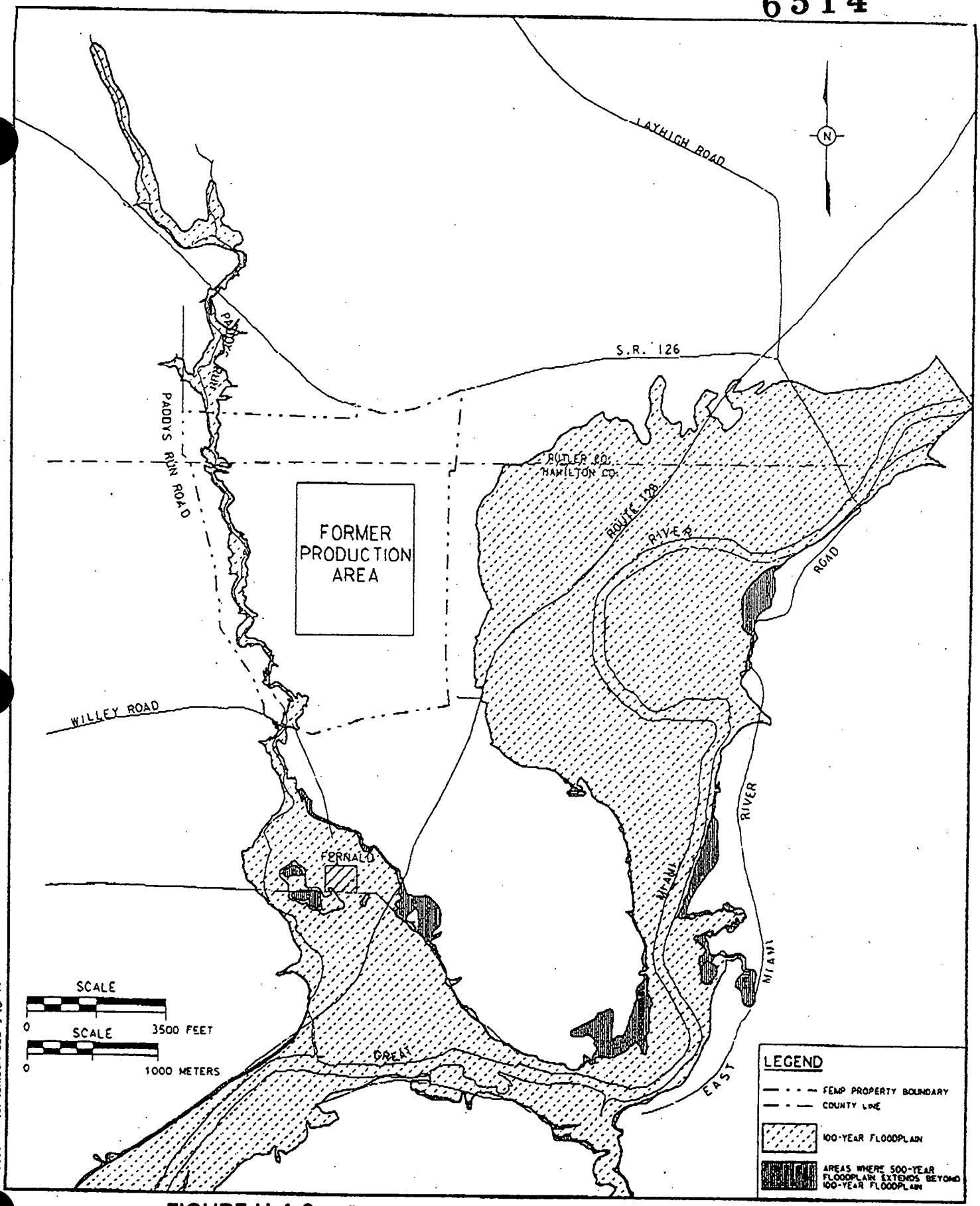

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FIGURE H.4-2 GREAT MIAMI RIVER AND PADDYS RUN 100-YEAR AND 500-YEAR FLOODPLAIN

TABLE H.4-1
POTENTIAL FLOODPLAIN IMPACTS

Proposed Alternative	Floodplain Impact
Seepage Collection System/Removal of Sediments	Limited excavation, sedimentation, runoff in floodplain; minimal or no change in flood elevation.

Other Alternatives Considered	Floodplain Impact
No Action	No impact.
Seepage Interceptor System/Removal of Sediments	Limited excavation, sedimentation, runoff in floodplain; minimal or no change in flood elevation.

H.5.0 ALTERNATIVES CONSIDERED

The proposed alternative discussed in Section H.3.0 was chosen from among three possible alternatives. The other alternatives evaluated involved taking no action and constructing a seepage interceptor system while performing sediment removal.

H.5.1 NO ACTION

The no action alternative is retained to provide a comparative baseline against which other alternatives can be evaluated. However, the no action alternative would not be protective of human health and the environment and therefore, the no action alternative was not selected.

H.5.2 SEEPAGE INTERCEPTOR SYSTEM/REMOVAL OF SEDIMENT

This alternative would involve the removal of contaminated sediments in the low area in the southeast corner of the South Field and the construction of a seepage interceptor system. This alternative would result in the same floodplain impacts as described (Section H.30) for the proposed removal action. Excavation and construction activities would result in direct and indirect impacts to approximately 0.28 ha (0.70 ac) of the floodplain. Direct floodplain impact could occur from the excavation of contaminated sediments within the floodplain and heavy equipment operating within the floodplain during the construction of the interceptor system; however, minimal or no change in flood elevation would be expected.

REFERENCES

Parsons, 1993, "100- and 500-year Floodplain Determination Sitewide," Fernald Environmental Management Project, Cincinnati, Ohio, prepared for the U.S. Department of Energy, Fernald Field Office, Fernald, Ohio

U.S. Department of Energy (DOE), 1979, "Compliance with Floodplains/Wetlands Environmental Review Requirements," 10 CFR Part 1022, March 7, Federal Register, U.S. Government Printing Office, Washington, DC.

U.S. Department of Energy (DOE), 1994, Operable Unit 2 Feasibility Study Report.

Attachment I

Permit Information Summary

ATTACHMENT I
PERMIT INFORMATION SUMMARY
Removal Action No. 31

1. Introduction

This permit information summary was prepared to document any regulatory requirements for the activities proposed under Removal Action 31 (RA 31), Seepage Control at the South Field (SF) and Inactive Flyash Pile (IFP). The goal of RA 31 is to reduce impacts on the Great Miami Aquifer from contaminated seepage at the SF and IFP and infiltration through sediment at the southeast corner of the SF. The project has been proposed in response to the Removal Site Evaluation (RSE) of seepage at the SF and IFP and the subsequent action memorandum from the United States Department of Energy (DOE). Copies of these documents are presented in Attachments A and B, respectively.

Although RA 31 is exempt from administrative permitting requirements (CERCLA 121(e), 40 CFR 300.400(e) and Paragraph XIII A of the Amended Consent Agreement), Paragraph XIII.B of the Amended Consent Agreement requires DOE to supply specific information regarding any permits that would have been required for the project in the absence of the CERCLA permitting exemption. Pursuant to Paragraph XIII.B of the Amended Consent Agreement, the following information is required:

1. Identification of each permit that would have been required in absence of the CERCLA 121(e) permitting exemption;

2. Identification of the standards, requirements, criteria, or limitations that would have had to have been met to obtain the permits; and

3. Explanation of how the response action will meet the substantive requirements, criteria, or limitations identified in item 2, above.

2.0 Information Required by Paragraph XIII.B of the Amended Consent Agreement

The following sections of this Attachment have been prepared to address the requirements described above and to provide a detailed description of how substantive permitting requirements for the project will be addressed.

1. Identification of each permit that would be required in the absence of the CERCLA 121(e) permitting exemption:

Federal Permits/Notifications

- **National Pollutant Discharge Elimination System (NPDES) Permit - Stormwater Discharges Associated with Industrial Activities:**

Pursuant to 40 CFR 122.26(a)(1)(ii) and 40 CFR 122.26(b)(14(v)(x), a discharge composed entirely of stormwater associated with industrial activity would require a NPDES Stormwater Discharge permit. Although the proposed project will not result in the generation of a new or diferent industrial stormwater discharge, a new point source conveyance of industrial stormwater will be created. Therefore, a NPDES Stormwater Permit would have been required to cover this discharge.

State Permits/Notifications

- **OAC 3745-31 - OEPA Permits to Install:**

Pursuant to OAC 3745-31-02(A), a permit to install would be required to install a new wastewater treatment facility or to modify an existing wastewater treatment facility within the state of Ohio. Because the proposed collection system will discharge to the Advanced Waste Water Treatment System, it might have been necessary to modify the permit to install for the AWWT to reflect the additional flow from RA 31. Once finalized design for the collection system has been obtained, a formal determination on the need to modify the AWWT permit to install will be made. In the event it is determined a permit modification would have been required, a revised permit application will be submitted to OEPA for informational purposes only.

2.Identification of the standards, requirements, criteria, or limitations that would have had to have been met to obtain the permits:

Federal Permits/Notifications

- **National Pollutant Discharge Elimination System (NPDES) Permit - Stormwater Discharges Associated with Industrial Activities:**

The FEMP filed an individual Stormwater Permit Application with the OEPA in September 1992. The original permit application covered industrial stormwater discharges from four outfalls located along Paddy's Run Creek. Given that the proposed project will result in the construction of a new outfall which will convey industrial stormwater to a tributary of Paddy's Run Creek (note: the proposed project will not result in the generation of a new or different industrial stormwater discharge), a permit modification would have been required to cover the discharge. In addition to the permit modification, the FEMP would have to implement engineering practices to control and monitor stormwater during removal, treatment, and disposal in accordance with 40 CFR 122.26.

State Permits/Notifications

- **OAC 3745-31 - OEPA Permits to Install:**

The permit to install for the AWWT was issued by OEPA in December, 1993. Given that the proposed project will result in the discharge of additional wastewater to the AWWT system, a permit modification may have been required. In the event a modification would have been required, the FEMP will submit a revised permit application to OEPA for informational purposes only.

3.Explanation of how the response action will meet the substantive requirements, criteria, or limitations identified in item 2 above.

Federal Permits/Notifications

- **National Pollutant Discharge Elimination System (NPDES) Permit - Stormwater Discharges Associated with Industrial Activities:**

The original FEMP NPDES Stormwater Permit Application will be revised to reflect the addition of the stormwater outfall to the tributary to Paddy's Run Creek (as described above in Item 1). The revised application will be submitted to the OEPA for review and approval.

State Permits/Notifications

- **OAC 3745-31 - OEPA Permits to Install:**

Once detailed design for the proposed collection system has been obtained, a determination on the need for a modification of the AWWT permit to install will be made. In the event a permit modification would have been required, the FEMP will submit a revised permit to install application to OEPA for informational purposes only.