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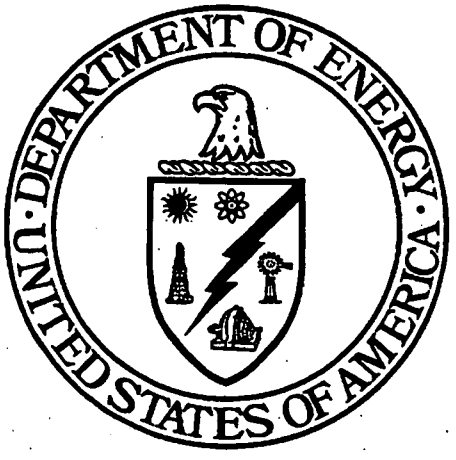
REMEDIAL ACTION WORK PLAN FOR AQUIFER RESTORATION AT OPERABLE UNIT 5

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO



APRIL 1997

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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A/E	Architect/Engineering
ARAR	Applicable or Relevant and Appropriate Requirement
AWWT	Advanced Wastewater Treatment [Facility]
CAT	Construction Acceptance Testing
CFR	Code of Federal Regulations
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CM	Configuration Management
CRP	Community Relations Plan
CWA	Clean Water Act
D&D	Decontamination & Dismantlement
DCN	Design Change Notice
DOE	U.S. Department of Energy
DOE-FEMP	U.S. Department of Energy - Fernald Field Office
EPA	U.S. Environmental Protection Agency
FD	Fluor Daniel
FEMP	Fernald Environmental Management Project
FFCA	Federal Facilities Compliance Act
FRESH	Fernald Residents for Environment, Safety, and Health
FRL	Final Remediation Level
HDPE	High-Density Polyethylene
H&S	Health and Safety
IAWWT	Interim Advanced Wastewater Treatment
IEMP	Integrated Environmental Monitoring Plan
IFB	Invitation for Bid
IH	Industrial Hygiene
NAGPRA	Native American Graves Protection and Repatriation Act
NCP	National Oil & Hazardous Substances Pollution Contingency Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
O&M	Operations and Maintenance
OEPA	Ohio Environmental Protection Agency
ORR	Operational Readiness Review
OSDF	On-Site Disposal Facility
PEIC	Public Environmental Information Center
PG	Performance Grade
PSHSP	Project Specific Health and Safety Plans
PTI	Permit-to-Install

PTO	Permit-to-Operate
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RA	Remedial Action
RCI	Request for Clarification or Information
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
ROD	Record of Decision
SOT	Systems Operability Testing
SOW	Statement of Work
SPIT	South Plume Interim Treatment
SSC	Systems, Structures, and Components
SSOD	Storm Sewer Outfall Ditch
SSOP	Standard Site Operating Procedure
SSR	Standard Startup Reviews
TBC	To Be Considered
UIC	Underground Injection Control
U.S. EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This Remedial Action (RA) Work Plan for Aquifer Restoration provides the implementation strategy and enforceable schedule for completing the restoration of contaminated portions of the Great Miami Aquifer at the U.S. Department of Energy's (DOE's) Fernald Environmental Management Project (FEMP). The RA Work Plan is the sister document to the *Remedial Design Work Plan for Remedial Actions at Operable Unit 5* (RD Work Plan), which provides the general scope of work and deliverable schedule for the design of the aquifer restoration remedial action. In accordance with the approved deliverable schedule, this RA Work Plan is submitted to fulfill the requirements of Task 10 in the RD Work Plan.

The scope of the aquifer restoration remedial action is set forth in the *Final Record of Decision (ROD) for Remedial Actions at Operable Unit 5* (DOE 1996c). As described in the ROD, the pertinent portions of the selected remedy, relative to aquifer restoration, are:

- Restoration of the Great Miami Aquifer through pump and treat technologies to attain the final remediation levels;
- Treatment of collected storm water, process wastewater generated through remedial activities, and recovered contaminated groundwater to the extent necessary to ensure that discharge limits are attained; and
- Long-term groundwater monitoring.

Subsequent reinjection of treated groundwater into the aquifer is recommended in the FEMP's Draft Baseline Remedial Strategy Report (DOE 1996a) to enhance and quicken the "base-case" pump and treat remedial action contained in the Operable Unit 5 ROD.

The overall goal of the aquifer restoration remedial action is to safely remediate the Great Miami Aquifer in a timely, efficient and cost-effective manner that is protective of human health and the environment and is compliant with environmental regulations. The environmental regulatory requirements pertinent to the aquifer restoration remedial action are listed in the Operable Unit 5 ROD and include all associated applicable or relevant and appropriate requirements (ARARs) and to be considered (TBC) criteria.

This work plan was prepared in accordance with the U.S. Environmental Protection Agency (EPA) approved RA Work Plan outline (Craig 1995) and the format for previously approved RA Work Plans for the FEMP's other operable units and projects. The approved outline and this RA Work Plan address the explicit requirements of the Amended Consent Agreement, and are based on Superfund remedial design and remedial action guidance (EPA 1986) and guidance on EPA oversight of remedial design and remedial action performed by potentially responsible parties (EPA 1990).

1.2 PROJECT APPROACH

The RD Work Plan establishes the schedule for developing the final construction drawings, specifications and plans necessary for implementing the Operable Unit 5 selected remedy (preparation and submittal of this RA Work Plan was defined as Task 10 in the RD Work Plan). The remedial design strategy for aquifer restoration, as presented in the RD Work Plan, established the use of area-specific groundwater restoration modules which will be brought on line as needed during the life of the remedy. Once remedial objectives within an area are achieved, each module will be independently withdrawn from service. This area-specific modular approach also forms the basis for development of the enforceable implementation schedule conveyed in this RA Work Plan.

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Restoration of the Great Miami Aquifer will be conducted through seven individual modules with distinct extraction and injection wellfield patterns and installation timeframes. Two of these six modules are already underway: the South Plume Removal Action Module (operational since 1993) and the South Field Extraction System Module (wellfield installed in 1996). The remaining five modules are the South Plume Optimization Module, the Injection Demonstration Module, the Waste Storage Area Module, ~~and~~ the Plant 6 Area Module, and the South Field Injection System Module. The extracted groundwater from these modules will be treated as necessary to satisfy ROD requirements through the Advanced Wastewater Treatment (AWWT) Facility, which will be expanded to accommodate additional contaminated groundwater treatment capacity for use over the life of the remedy.

1.3 PROJECT ORGANIZATION AND RESPONSIBILITIES

The governing document for conducting the site-wide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial action is the Amended Consent Agreement between the DOE and the EPA Region V, signed in September 1991. As such, ultimate project

management responsibility lies with these two agencies as defined by this agreement. The DOE, via the DOE Fernald Area Office (DOE-FEMP), is the lead agency responsible for CERCLA activities at the FEMP; the EPA is responsible for oversight and approval. In addition, the Ohio Environmental Protection Agency (OEPA) has regulatory authority for Resource Conservation and Recovery Act (RCRA) and Clean Water Act (CWA) activities.

Both the DOE and EPA have engaged contractors to perform identified scopes of work related to their prime areas of responsibility for site remediation. Fluor Daniel-Fernald (FD-Fernald), the primary contractor for DOE-FEMP, is responsible for conducting and planning the remedial action under the oversight of DOE-FN. The architect/engineering (A/E) subcontractor and construction subcontractors under FD-Fernald are responsible for the design and implementation of certain portions of the remedial action under FD-Fernald's oversight. Figure 1-1 depicts this administrative relationship matrix for all of the organizations mentioned above.

The DOE-FEMP is the ultimate authority for ensuring that the aquifer restoration remedial action is performed in a manner that meets all project goals, standards, specifications, and requirements of the Operable Unit 5 ROD and the RD and RA Work Plans. The DOE Operable Unit 5 Team Leader provides the overall programmatic direction for the remedial action. Although the DOE performs direct oversight of the remedial action, it is also represented and actively involved in all Aquifer Restoration and AWWT and Wastewater Project activities during each stage of project planning and implementation. The Office of Safety Assessment of DOE-FEMP assigns an individual from the DOE Facilities Representatives Department to perform independent field oversight for all remedial activities under this project. DOE-FEMP also conducts field oversight through technical leads responsible for construction, engineering, quality assurance and quality control, and health and safety. The DOE Facilities Representative and technical leads immediately notify the DOE Remediation Program manager of any issues or problems that arise in an effort to seek prompt resolution.

The FD-Fernald Aquifer Restoration and the AWWT and Wastewater Project Managers provide the overall project management and technical guidance to the Aquifer Restoration and AWWT and Wastewater team. The team provides all of the necessary technical, regulatory, and administrative input required for the project, under the direction of the project managers. The team, depicted in Figure 1-2, includes the following FD-Fernald positions:

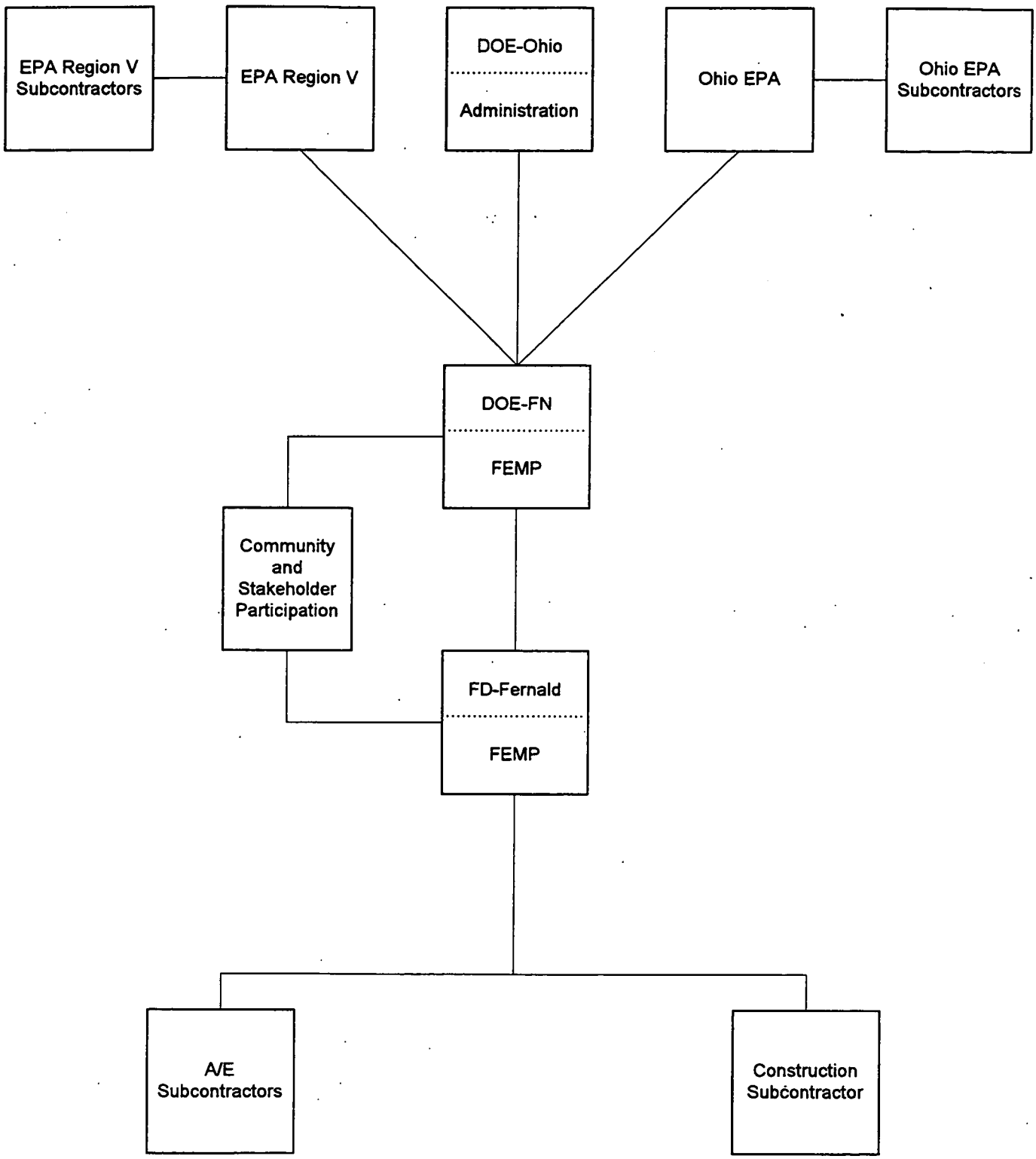

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FIGURE 1-1. FEMP ADMINISTRATIVE RELATIONSHIP

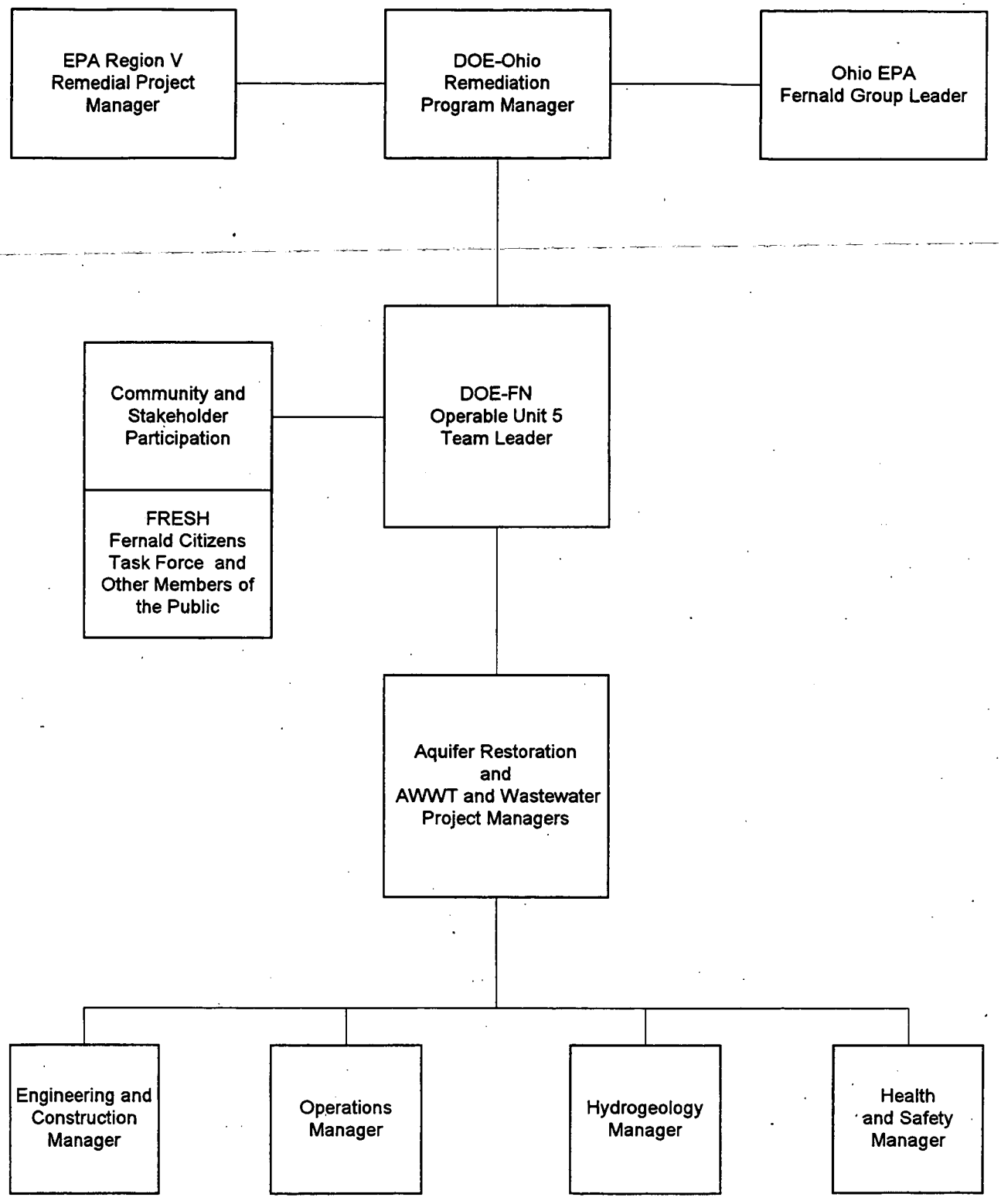

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FIGURE 1-2. AQUIFER RESTORATION REMEDIAL ACTION LEAD PROJECT PERSONNEL

- **Engineering and Construction Manager** -- responsible for coordinating all engineering requirements, design, construction, and start-up.

- **Hydrogeology Manager** -- responsible for managing programmatic aquifer issues and groundwater modeling, and also responsible for compliance with regulatory requirements associated with groundwater monitoring and wastewater management and treatment.

- **Operations Manager** -- responsible for directing operations of all groundwater and wastewater treatment.

- **Health and Safety Manager** -- responsible for implementing the project's health and safety program.

Stakeholder participation in the remedial action process will be coordinated through both the DOE and FD-Fernald Public Affairs Specialists in accordance with the Community Relations Plan for the FEMP, as described in Section 8.0 of this RA Work Plan.

1.4 WORK PLAN APPROACH AND ORGANIZATION

This RA Work Plan provides the overall framework for performing the aquifer restoration remedial action authorized under the approved Operable Unit 5 ROD. The framework includes the overall implementation strategy and, in accordance with the Amended Consent Agreement, the remedial action specific milestones and schedule subject to enforceable deadlines by the EPA. The general approach of this work plan is as follows:

- Summarize the purpose and scope of the aquifer restoration remedial action (Section 1.0)

- Describe programmatic strategies and requirements for implementation of the aquifer restoration remedial action (Section 2.0)

- Identify the permit requirements necessary for performing the remedial activities (Section 3.0)

- Develop a framework from which support plans and documents will be initiated and completed (Sections 4.0 through 8.0).

To support the above general approach, this RA Work Plan is comprised of eight sections; the sections and their contents are as follows:

Section 1.0 Introduction - Discussion of the purpose and scope of this RA Work Plan, the project approach, the work plan approach and organization, and project organization and responsibilities.

Section 2.0 Remedial Action Implementation Strategy - Description of the overall remedial action process, construction and sequencing of the aquifer restoration remedial action components, project milestones, operable unit integration, and construction management and control.

Section 3.0 Project Permit Requirements - Discussion of permits required to implement the remedial activities.

Section 4.0 Sampling and Analysis Requirements - Determination of the appropriate documents that address sampling and analysis requirements.

Section 5.0 Health and Safety/Contingency Plan - Discussion of health and safety requirements and related documentation, and site-wide emergency planning requirements.

Section 6.0 Operation and Maintenance - Determination of the appropriate document that addresses operation and maintenance of the remedial activity components.

Section 7.0 Groundwater Monitoring - Determination of the appropriate document that addresses groundwater monitoring for the remedial action.

Section 8.0 Community Relations - Description of planned community relations activities through the remainder of the remedial action and post-remedial operation and maintenance.

2.0 REMEDIAL ACTION IMPLEMENTATION STRATEGY

This section describes the implementation strategy for the aquifer restoration remedial action. During the remedial action, several groundwater extraction modules will come on line to combine with the currently active South Plume Removal Action Module, and the existing AWWT Facility will be expanded. The following subsections describe the implementation of these actions. First, the overall remedial action process is established in Section 2.1, then, the construction and sequencing of the individual components is presented in Section 2.2. Section 2.3 presents the milestones for the actions, and Section 2.4 discusses procurement issues that may affect the milestone schedule. Integration with other operable unit projects is discussed in Section 2.5. Lastly, Section 2.6 describes the construction management and control process for constructing the injection/extraction well systems and the AWWT Facility expansion.

2.1 REMEDIAL ACTION PROCESS

As the FEMP is a DOE facility undergoing a CERCLA-driven remedial action, both DOE and CERCLA requirements must be met throughout the remedial action process. To create a practical project implementation strategy which meets the intent of both sets of requirements, pertinent elements from each set of requirements have been merged into one process appropriate for the aquifer restoration project. Figure 2-1, Responsible Party Lead Remedial Action Process for Aquifer Restoration Components (extracted from OSWER Directive 9355.0-A and modified), depicts this process and represents the overall approach to be applied towards construction of each aquifer restoration module and the AWWT Facility Expansion.

7 Most of the remedial action process depicted in Figure 2-1 is detailed in Section 2.6, Construction Management and Control. Once the bidding and procurement process has been completed, FD-Fernald oversees and monitors the remedial action construction by using Construction Management practices, which are described in Section 2.6.3. A description of the remedial action process from Construction Acceptance Testing through Standard Startup Review is provided in Section 2.6.4. After completion of each aquifer restoration module, which are described below in Section 2.2, a module-specific Remedial Action Report will be submitted that demonstrates completion of the module. It is currently envisioned that these Remedial Action Reports will be based on IEMP monitoring data and will be submitted as part of the IEMP reporting process. After all modules have been completed, and each module-specific

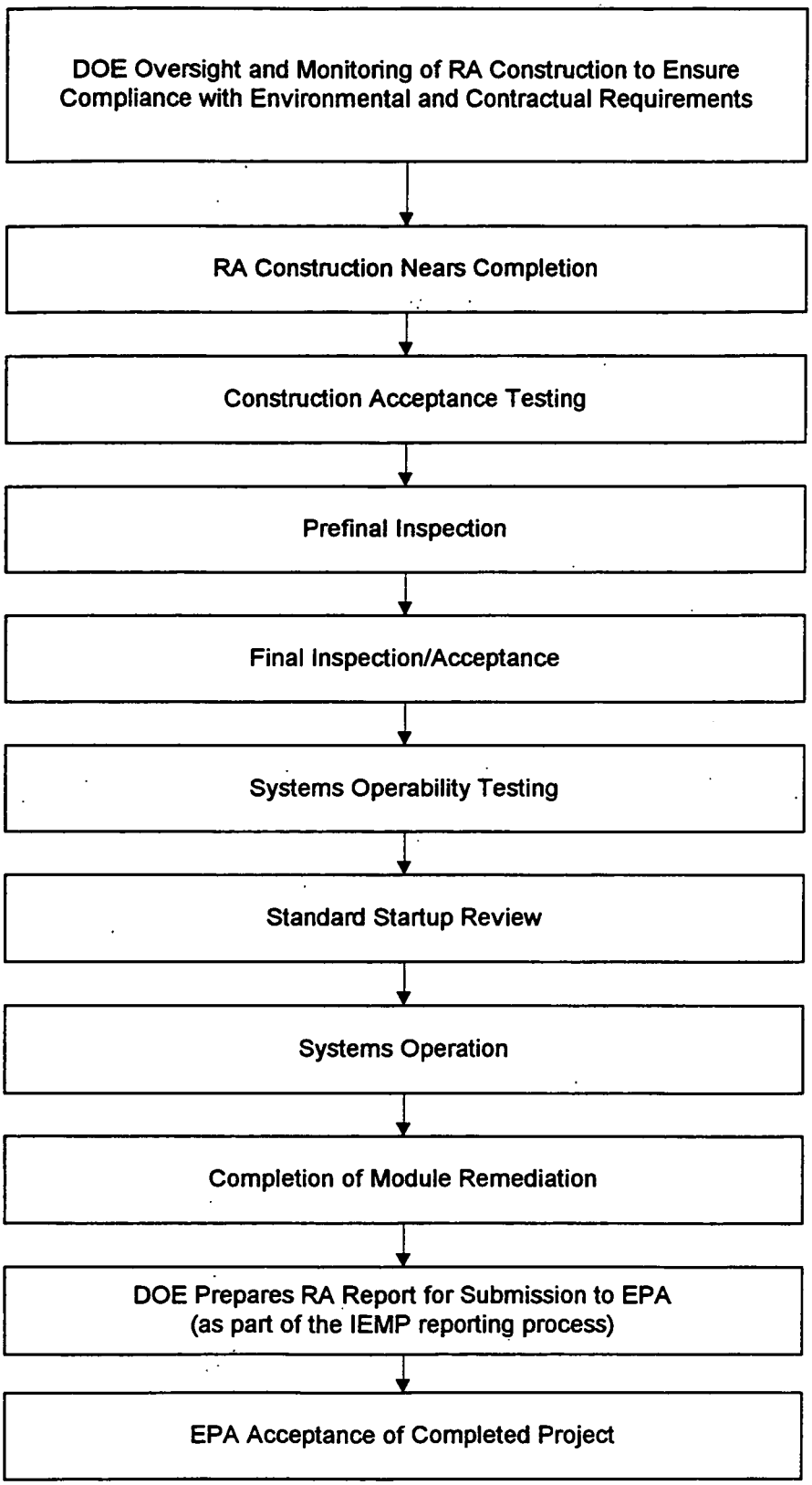

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FIGURE 2-1. RESPONSIBLE PARTY LEAD REMEDIAL ACTION PROCESS FOR AQUIFER RESTORATION COMPONENTS

FER\OU5\RAWP-GW\FIG2-1.VSD\April 11, 1997

Remedial Action Report has been submitted and approved by U.S. EPA, the aquifer restoration project will be complete.

2.2 CONSTRUCTION AND SEQUENCING FOR THE AQUIFER RESTORATION MODULES AND AWWT FACILITY EXPANSION

DOE 1 2 3 The following subsections describe the individual components comprising the aquifer restoration remedial action. The aquifer restoration remedial action is unique in that several components have already been initiated as a result of EPA-approved early-start initiatives and groundwater-related removal actions. These components include the South Plume Removal Action Module, the AWWT Facility, and Phase I of the South Field Extraction System Module. The remaining components have yet to be initiated and include the South Plume Optimization Module, Phase II of the South Field Extraction System Module, the Injection Demonstration Module, the South Field Injection System Module, the Waste Storage Area Extraction System Module, and the Plant 6 Area Extraction System Module. ~~The specific well and pumping rates for each module is provided in the Draft Baseline Remedial Strategy Report, which was submitted to EPA as Task 1 of the RD Work Plan (DOE 1996d). Following approval by EPA, the Baseline Remedial Strategy Report will establish the final technical basis for the site-wide aquifer restoration remedial action system design.~~ The module strategy presented below differs from that provided in the RD Work Plan (1996d). The RD Work Plan dictated the deliverable date for the Draft Baseline Strategy Report, which was subsequently submitted after approval of the Final RD Work Plan. Both the RD Work Plan and the Draft Baseline Remedial Strategy Report included a concurrently developed module strategy that was designed to meet the accelerated clean-up plan. Since its first submittal, the Baseline Remedial Strategy Report has been revised, resulting in some alterations to the module strategy presented in the Draft Baseline Remedial Strategy Report and the RD Work Plan. The strategy presented in this RA Work Plan reflects the latest strategy developed through the Baseline Remedial Strategy Report. The primary differences between the module strategy originally presented in the RD Work Plan versus this RA Work Plan are as follows:

- The South Field Extraction System Module now includes a discrete additional phase (Phase II), and;
- All injection wells for the South Field plume are incorporated into a new South Field Injection System Module.

~~Below is a description of each component and its current status. The task number associated with each component is as defined in the Operable Unit 5 RD Work Plan, and does not imply any rank or sequence.~~ Below is a description of each activity/module and its current status. The location of each aquifer restoration module is depicted in Figures 2-2 and 2-3. Each aquifer restoration module is comprised of two basic elements: well installation and construction of piping and associated utilities. The descriptions of the elements are based upon the current strategy in the Draft Baseline Remedial Strategy Report, and are presented to generally describe the elements of each component. Changes to the specific descriptions below will be documented in each of the remedial design package submittals.

2.2.1 AWWT Facility Expansion (Task 8)

In accordance with the Operable Unit 5 ROD, the existing capacity of the AWWT Facility will be expanded to the maximum extent achievable within the confines of Building 51. This capacity will enhance the FEMP's ability to meet groundwater, storm water, and wastewater treatment needs and to satisfy discharge requirements for release of water to the Great Miami River.

~~The Architect/Engineering subcontractor is responsible for the design of the AWWT Facility expansion. When the final design is complete, a construction subcontract will be awarded for building the expansion. Once construction is completed, inspected, and accepted, systems testing will be conducted to ensure proper operations. After successful testing, the expansion will be brought on-line. This sequence of events will follow the construction management and control process described in Section 2.5.~~ The design of the AWWT Facility Expansion is complete and a construction subcontract has been awarded for building the expansion. The AWWT Facility Expansion will be located within Building 51 (Figure 2-2). The expansion will be comprised of an aeration tank and blower, four multimedia filter vessels, and six ion exchange columns. The existing electrical and control systems within Building 51 will be expanded to accommodate the new treatment units. Once construction is completed, inspected, and accepted, systems testing will be conducted to ensure proper operations. After successful testing, a standard startup review (SSR) will be conducted to ensure all procedures and maintenance plans are in order; then, the expansion system will be brought online.

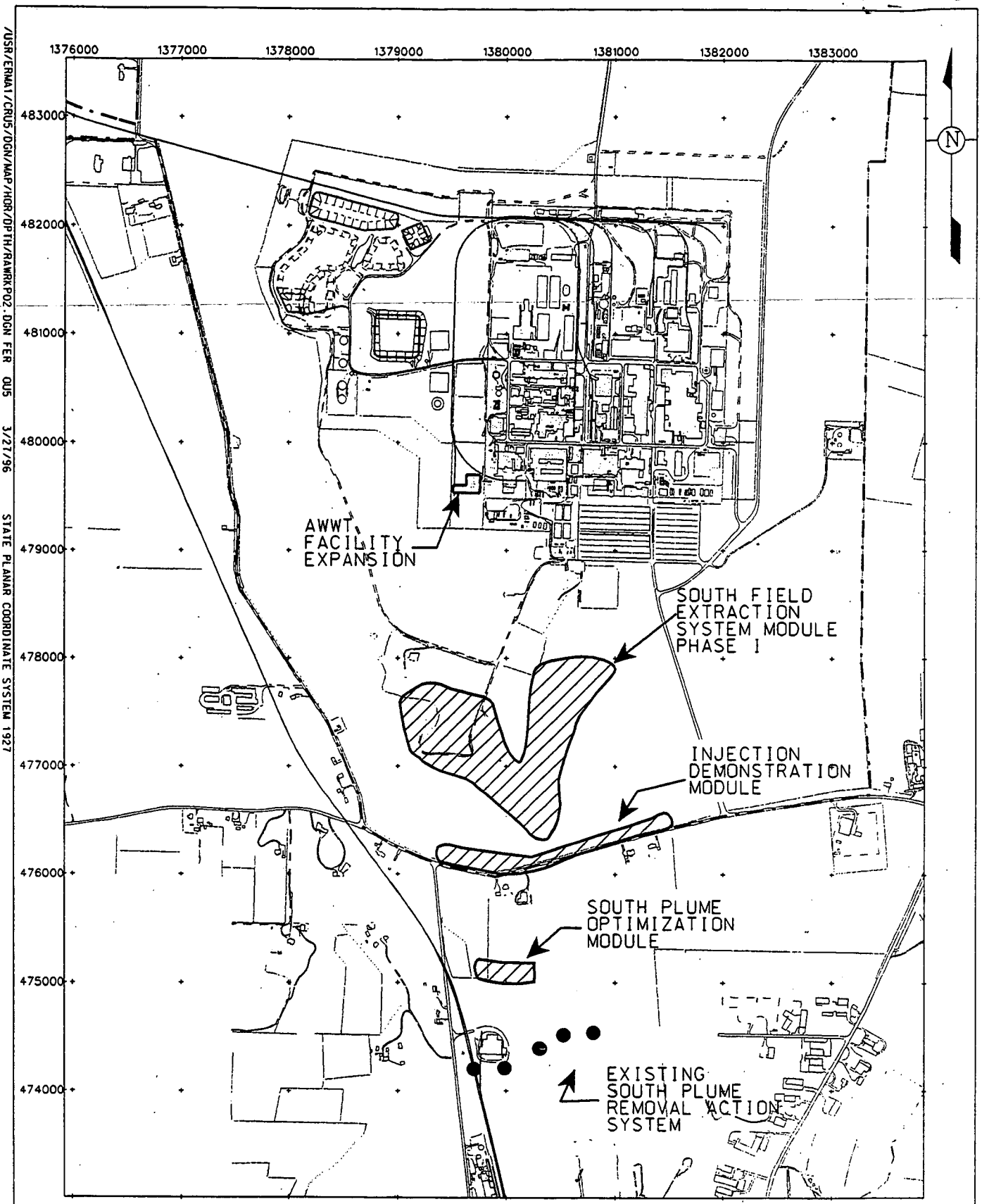

FIGURE 2-2. LOCATION OF NEAR-TERM AQUIFER RESTORATION MODULES

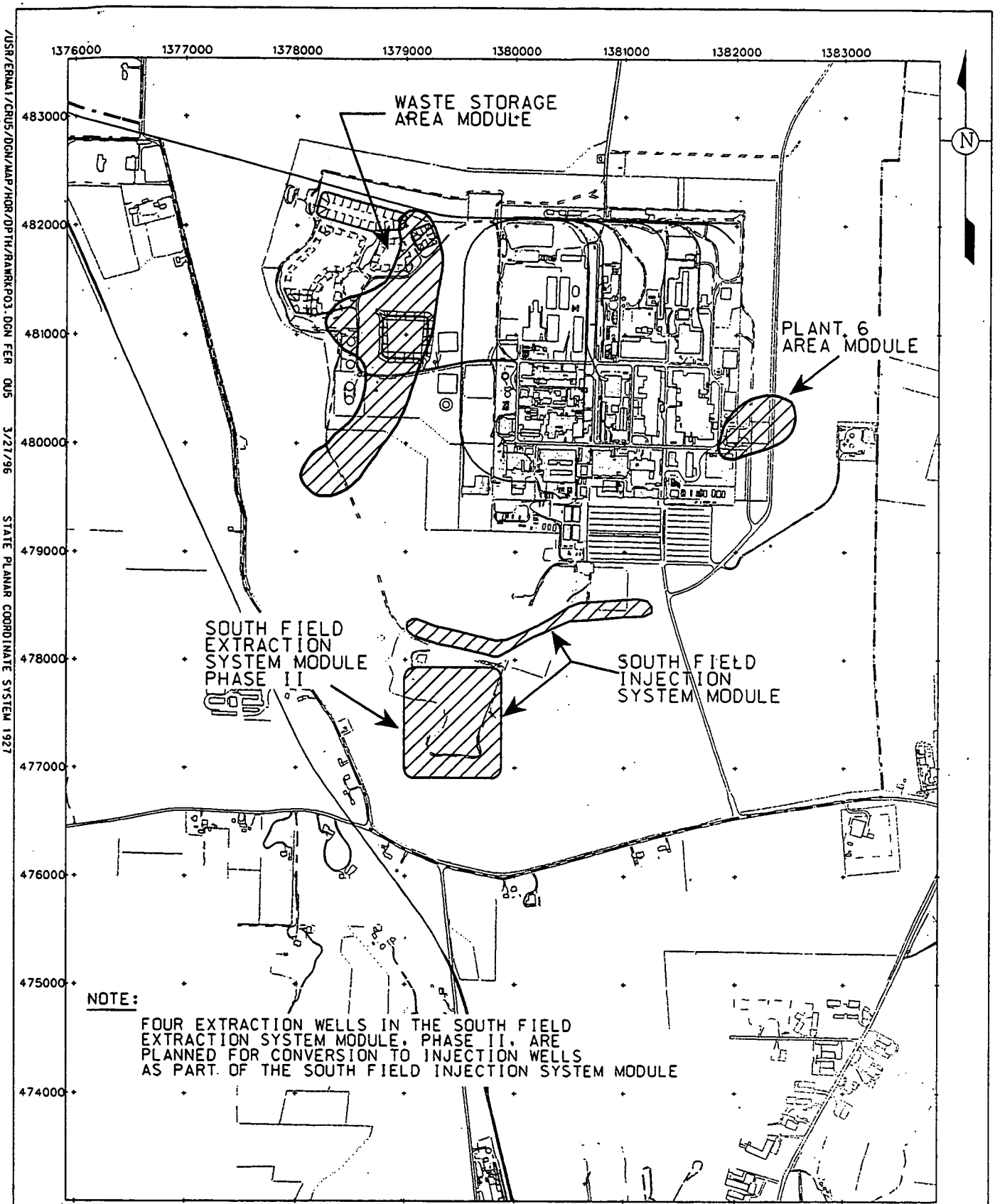

FIGURE 2-3. LOCATION OF LONG-TERM AQUIFER RESTORATION MODULES

2.2.2 South Plume Removal Action Module

In order to gain an early start on groundwater restoration, five extraction wells were installed in 1993 at the leading edge of the off-property South Plume as part of the South Plume Removal Action. The South Plume Removal Action well system began pumping in August 1993. The primary intent of this well system is to prevent the further migration of the off-property groundwater plume. Additional measures for the active restoration of the off-property plume will be conducted under the South Plume Optimization Module (Section 2.2.3). The wells in the South Plume Removal Action Module will continue to be pumped to prevent migration of the uranium plume until the South Plume Optimization Module is on line. If determined to be appropriate in the Baseline Remedial Strategy Report, when final, some or all of the South Plume Removal Action Module wells may continue to be pumped in order to augment the South Plume Optimization Module.

The South Plume Removal Action Module is not listed as a specific Task in the RD Work Plan because the design and construction of this module has already been completed.

2.2.3 South Plume Optimization Module (Task 5)

This module was so named during the agencies' review of the April 1995 South Plume Removal Action report and signifies the desire of EPA, OEPA and DOE to restore the off-property portion of the plume quickly and cost effectively. In order to accelerate the recovery of contaminants in the off-property area, additional extraction wells will be installed to supplement the plume containment wells of the South Plume Removal Action Module.

~~The Draft Baseline Remedial Strategy Report (DOE 1996a) proposes the final extraction well locations to complete this module. In this report, four extraction wells are proposed, all of which are located on private property adjacent to the FEMP. As described in the Draft Baseline Remedial Strategy Report, locations for two of the four wells (Wells 2N and KN) may be unacceptable to the property owner. Deliberations between DOE, EPA, Ohio EPA and the property owner are currently being conducted to determine the fate of these two wells. In order to maintain the schedule for design of the South Plume Optimization Module, the design will include only the two wells (1 and 3N) which are not objectionable to the property owner.~~

~~If, after conclusion of the deliberations with the property owner, it is determined that either one or both of the remaining wells are to be installed, then an additional "add-on" restoration module – South Plume Optimization II – will be developed through a formal addendum to the RD Work Plan. If implemented, the enforceable schedule and milestones for the South Plume Optimization II Module will be submitted as an addendum to this RA Work Plan (as part of the pre-final design package for this new module).~~

The South Plume Optimization Module is comprised of two extraction wells (Wells RW-6 and RW-7) located on private property adjacent to the FEMP (Figure 2-2). A third well location (3N) (also located on private property) has been identified as an optional contingency well location to be utilized in the future, if necessary. The Draft Final Baseline Remedial Strategy Report provides the criteria to be used to determine if and when this contingency well location will be installed. If Well 3N is found to be needed, an addendum to the RAWP will be submitted to include milestone activities and dates for the construction and operation of this well.

After site access easements have been obtained, construction activities will begin for the two extraction wells and the associated infrastructure. The module construction includes drilling two extraction wells, approximately 800 feet of trenching, placement of 1,800 feet of High Density Polyethylene (HDPE) piping, submersible pumps, electrical service, controls and instrumentation, and a valve house. Once construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order then the module will be brought online.

~~The milestones for this (Phase I) module include the award of two construction subcontracts to address well installation and construction of the accompanying piping network.~~ The schedule dates for this module are provided in Table 2-1 and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up).

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2.2.4 South Field Extraction System Module (Task 3)

~~In 1996, nine on-property extraction wells comprising the South Field Extraction System Module were installed in the vicinity of the South Field/storm sewer outfall ditch (SSOD) at the site, as part of an EPA approved early start initiative ahead of the issuance of the Operable Unit 5 ROD. These nine wells are designed to remove groundwater contamination in an on-property area where uranium contamination levels are highest. The piping network for the nine wells has yet to be constructed; award of the construction subcontract for this network is a remedial action milestone under this RA Work Plan.~~

~~The early start South Field Extraction System was designed to support the initial 27 year base case system presented in the Operable Unit 5 FS and ROD. As presented in the Draft Baseline Remedial Strategy Report, the proposed well field for 10 year cleanup includes additional extraction and injection wells in the South Field area (Phase II of the South Field Extraction System Module), to be installed after site remedial activities for contaminated soils and source areas have been completed, which is anticipated to be seven years. At that time, an addendum to the RA Work Plan will be submitted for Phase II of the South Field Extraction System Module to provide an enforceable milestone for the construction of the additional extraction wells, injection wells, and associated piping.~~ The South Field Extraction System Module is comprised of two Phases – Phase I and Phase II. South Field Extraction System Phase I Module includes ten extraction wells. In 1996, nine of the ten extraction wells were installed on-property in the vicinity of the South Field/storm sewer outfall ditch (SSOD), as part of an EPA-approved early start initiative. The nine wells are designed to remove groundwater contamination in an on-property area where uranium contamination levels are highest (Figure 2-2). The remaining work to be completed as part of Phase I include construction and installation of the tenth extraction well, new electrical high voltage power service, approximately 6,000 feet of trenching and placement of 12,000 feet of HDPE piping, variable speed submersible pumps, new access roadways, instrumentation and controls, ten well houses and one valve house. After construction is completed, inspected, and accepted, systems testing will be conducted. Once the systems testing is complete, an SSR will be conducted to ensure all procedures and maintenance plans are in order, prior to bringing the Phase I of the module online.

The nine-well early-start South Field Extraction System was designed to support the initial 27-year

base-case system presented in the Operable Unit 5 FS and ROD. As presented in the Draft Baseline Remedial Strategy Report, the proposed well field for the ten-year aquifer restoration includes additional extraction wells in the South Field area. These additional extraction wells will comprise Phase II of the South Field Extraction System Module and will be located in the area depicted in Figure 2-3. The Phase II extraction wells will be installed after Operable Unit 2 remedial activities for contaminated soils and source areas have been completed. Phase II includes installation and construction of nine extraction wells, approximately 1,500 feet of trenching and placement of 3,500 feet of HDPE piping, electrical service to each well, submersible well pumps, instrumentation and controls, and nine well houses. After completion, inspection and acceptance of construction, systems testing will be conducted. After systems testing is complete, an SSR will be conducted to ensure all procedures and maintenance plans are in order. After completion of the SSR, Phase II of this module will be brought online.

The schedule dates for Phases I and II of this module are provided in Tables 2-1 and 2-2, respectively, and include the award of subcontracts for well installation (Phase II only) and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). The schedule dates for Phase II of the South Field Extraction System Module are contingent on the completion of the source operable unit and soil remedial activities in this area, and are presented in Table 2-1. If these dates must change in the future, due to changes in the remedial action schedule for OU2 waste unit and soil remedial activities in this area, then an addendum to this RAWP will be submitted to include the revised schedule.

2.2.5 Injection Demonstration Module (Task 4)

~~Groundwater injection was determined to be a potentially viable strategy for enhancing aquifer restoration in the Draft Baseline Remedial Strategy Report. To test this technology at the field scale, a 5-well Injection Demonstration Module (Task 4 in the RD Work Plan), will be constructed. If the Injection Demonstration is successful, then additional injection wells may be added to the existing area specific modules. Such additions to the modules will be incorporated into the appropriate module specific design packages as needed.~~ Groundwater injection was determined to be a potentially viable strategy for enhancing aquifer restoration in the Draft Baseline Remedial Strategy Report. To test this technology at the field scale, a five-well Injection Demonstration Module (Task 4 in the RD Work Plan), will be constructed. If successful, injection wells may be added to the aquifer

restoration modules, if needed. The five injection wells will be located along Wiley Road on the southern boundary of the FEMP (Figure 2-2). The installation and construction of this module includes five injection wells, a 50,000 gallon surge tank, two 100 horsepower pumps, electrical service, approximately 5,000 feet of trenching and placement of HDPE piping, fabrication of injection well downcomers, instrumentation and controls. Once completed, the construction will be inspected and accepted, and systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order. After the SSR, the module will be brought online.

The schedule dates for this module are provided in Table 2-1, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up).

2.2.6 Waste Storage Area Extraction Module (Task 7)

~~Waste Storage Area Module will recover contaminants from beneath the waste storage area (Operable Units 1 and 4). Construction of the extraction wells for this module cannot occur until the area is accessible. It is assumed that after 7 years all of the remedial activity north of the SSOD will be completed. At that time, the milestones for this module will be submitted as an addendum to the RA Work Plan, as part of the pre-final design package for this module.~~ The Waste Storage Area Extraction System Module will recover contaminants from the Great Miami Aquifer underlying the waste storage area (Operable Units 1 and 4). Once this area is accessible, i.e., after the waste pit material and contaminated soil has been excavated, construction of this module can be initiated within this area (Figure 2-3). The construction includes installation of ten extraction wells, 7,000 feet of trenching and placement of 14,800 feet of HDPE piping, submersible pumps, new electrical high voltage power service to the area, instrumentation and controls, and ten well houses. After construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order. Once the SSR is complete, the module will be brought online.

The schedule dates for this module are provided in Table 2-2, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). These dates are contingent on the

completion of the source operable unit and soil remedial activities in this area. If these dates must be revised in the future due to schedule changes within the OU1 Waste Pit and OU2/OU5 Soil Excavation remedial activities, then an addendum to this RAWP will be submitted to include the new schedule.

2.2.7 Plant 6 Area Extraction Module (Task 6)

~~The Plant 6 Area Module will recover contaminants from beneath and just east of the FEMP's former production area. As stated above, the area will not be accessible until remedial activity has been completed, which is anticipated to be 7 years after initiation of site wide remedial actions. At that time, the milestone for construction of this module will be submitted as an addendum to the RA Work Plan, as part of the pre final design package for this module.~~ The Plant 6 Area Extraction System Module will recover contaminants in the Great Miami Aquifer located beneath and east of Plant 6, which is located in the southeastern portion of the FEMP's former production area. The module consists of two extraction wells located in this area (Figure 2-3). After D&D of Plant 6 and excavation of underlying contaminated soil, this area will be accessible, and construction of this module can be initiated. Construction of the Plant 6 Area Extraction System Module includes installation of two extraction wells, 3,300 feet of trenching and placement of HDPE piping, electrical service, submersible pumps, instrumentation and controls, one valve house and two well houses. Once construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order. Once the SSR is complete, the module will be brought online.

The schedule dates for this module are provided in Table 2-2, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). These dates are contingent on the completion of the source operable unit and soil remedial activities in this area. If these dates must be revised in the future due to schedule changes with the OU3 Plant 6 area D&D activities or related soil excavation, then an addendum to this RAWP will be submitted to include the new dates.

2.2.8 South Field Injection System Module

If the Injection Demonstration Module results indicate that re-injection is a viable aquifer restoration enhancement technology, then the aquifer restoration project will implement the South Field Injection

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System Module. This module includes all injection wells planned to enhance uranium removal from Phases I and II of the South Field Extraction System Module. The South Field Injection System Module was not described in the OU5 RDWP because it is based on further development of the Draft Baseline Remedial Strategy Report, which was submitted later than the OU5 RDWP.

The South Field Injection System Module construction includes installation of five injection wells and converting four existing extraction wells to injection wells. The South Field Injection module is located in the south-central portion of the FEMP within the South Field area (Figure 2-3). Construction of this module also includes a 100 horsepower pump, approximately 4,000 feet of trenching and placement of HDPE piping, instrumentation, and controls. Once construction is completed, inspected, and accepted, systems testing will be conducted. After successful testing, an SSR will be conducted to ensure all procedures and maintenance plans are in order; then, the module will be brought online.

The schedule dates for this module are provided in Table 2-2, and include the award of subcontracts for well installation and construction of the associated infrastructure, the completion of well installation and construction, and initiation of operations (start-up). If these dates must be revised in the future due to schedule changes with the OU2 Southern Waste Unit and associated soil remediation activities, then an addendum to this RAWP will be submitted to include the new schedule.

2.3 REMEDIAL ACTION SCHEDULE

~~In accordance with the modular restoration strategy employed for the Great Miami Aquifer, four of the remedial action elements mentioned above (South Plume Optimization Module, Injection Demonstration Module, AWWT Facility Expansion, and South Field Extraction System pipeline) are included in the remedial action schedule milestones in this RA Work Plan. In the outyears, enforceable schedules for the remaining modules — the Waste Pit Area Module, the Plant 6 Area Module, and Phase II of the South Field Extraction System Module — will be included with the respective design packages as RA Work Plan addenda, as described in Task 10 of the RD Work Plan. This process will also be used to address the enforceable schedule for the South Plume Optimization Module II (to accommodate Wells 2N and KN), if this additional module is deemed necessary.~~ In accordance with the modular restoration strategy employed for the Great Miami Aquifer, the start-up dates of the four remedial action elements mentioned above (South Plume Optimization Module,

Injection Demonstration Module, AWWT Facility Expansion, and South Field Extraction System) are included in the remedial action schedule milestones in this RA Work Plan (Table 2-1). The other dates in Table 2-1, and all the dates in Table 2-2, are provided to show the interim construction-related schedule leading to the start-up of each module. The Waste Pit Area Extraction System Module, the Plant 6 Area Extraction System Module, Phase II of the South Field Extraction System Module, and the South Field Injection System Module have long-term schedule dates provided in Table 2-2 with the following contingencies:

- All other remedial action projects scheduled within the planned aquifer restoration module areas need to be essentially complete prior to extraction/injection well installation and construction of the associated piping and electrical infrastructure. This is necessary to provide access for direct groundwater extraction from "hot spots" that reside beneath the source areas comprising the other Operable Units. These other projects include: the OU1 Waste Pit excavations; the OU3 Plant 6 D&D in the Plant 6 Area Extraction System Module area; and the OU2 South Field excavation in the South Field Extraction System Phase II Module area.

- The actual in-the-ground performance of the groundwater remedy is highly dependent on the field-scale geochemical and hydraulic characteristics of the aquifer, which could influence the current "best estimate" predictions of aquifer response to the planned restoration activities.

- Several field-scale uncertainties remain with the planned injection demonstration technology, which affects whether or not the technology will be applied beyond the initial Injection Demonstration Module. The purpose of the Injection Demonstration is to critically examine these uncertainties and resolve the long-term viability of the technology. Whether or not the follow-up South Field Injection System Module will even be implemented depends on the outcome of the Injection Demonstration.

- The FEMP's ten-year aquifer restoration plan is a good faith effort on the part of DOE to improve dramatically on the 27 year estimate contained in the ROD (which employs conventional technologies with higher likelihood of implementation success). As such, there are uncertainties that can affect whether or not the ten-year plan can be achieved, and the composition and timing of out-year modules is heavily dependent on the level of understanding that is gained from the behavior and response of the near-term modules.

~~The schedule milestones for the aquifer restoration are based on the award of subcontracts for the major construction activities throughout the project, and are provided in Table 2-1.~~ The schedule dates and milestones for the aquifer restoration are provided in Tables 2-1 and 2-2. These dates are presented for the award of subcontracts for the well installation, the award of subcontracts for construction of the associated infrastructure, completion of well installation and construction, and the initiation of operations (start-up). Discussions concerning the initiation and completion of the

remedial action is provided in Sections 2.3.1 and 2.3.2, respectively.

DOE Each of the aquifer restoration modules requires two contracts -- one for installation of extraction/injection wells, and one for construction of the piping network. ~~Because the South Field extraction wells have previously been installed, only a construction contract for the piping network remains to be awarded for Phase I of the South Field Extraction System Module.~~

TABLE 2-1

AQUIFER RESTORATION REMEDIAL ACTION SCHEDULE FOR NEAR-TERM ACTIONS

Activity/Module	Well Installation Contract Award	Infrastructure Contract Award[a]	Complete Construction	Commence Operations
AWWT Expansion	N/A	Complete	February 27, 1998	**April 30, 1998[c]**
Injection Demonstration	Complete	September 5, 1997	June 1, 1998	**August 1, 1998[c]**
South Plume Optimization	November 1, 1997	January 2, 1998	July 1, 1998	**September 1, 1998[c]**
South Field Extraction System Phase I	NA[b]	February 1, 1998	August 1, 1998	**September 30, 1998[c]**

[a]The infrastructure contract for the groundwater extraction modules includes all construction activities other than well drilling (e.g., installation of electrical, instrumentation, pipelines, pumps and associated equipment).
[b]Nine of the ten Phase I South Field Extraction System Module wells were installed previously under the 1995 Project-Specific Plan for the Installation of the South Field Extraction System (DOE 1995c).
[c]The dates provided for commencing operations (start-up) are the enforceable milestones for the aquifer restoration remedial action. All other dates are provided for information purposes to demonstrate their relationship to the enforceable (commence operations) milestones.

TABLE 2-2

AQUIFER RESTORATION REMEDIAL ACTION SCHEDULE FOR LONG-TERM ACTIONS[a]

Activity/Module	Well Installation Contract Award	Infrastructure Contract Award[b]	Complete Construction	Commence Operations
South Field Injection System	October 1, 2002	December 31, 2002	August 1, 2003	October 1, 2003
South Field Extraction System Phase II	November 30, 2002	December 31, 2002	August 1, 2003	October 1, 2003
Waste Pit Area Extraction System	October 31, 2002	December 1, 2002	August 1, 2003	October 1, 2003
Plant 6 Area Extraction System	February 1, 2003	March 1, 2003	August 1, 2003	October 1, 2003

[a]The long-term projected dates are contingent upon completion of OU1, OU3, and OU2/OU5 remedial activities in the module areas. If these projects are delayed, then revised schedules and milestones will be submitted in addenda to this RAWP.
[b]The infrastructure contract for the groundwater extraction modules includes all construction activities other than well drilling (e.g., installation of electrical, instrumentation, pipelines, pumps and associated equipment).

~~The remedial action milestones for the Waste Storage Area Extraction Module, the Plant 6 Extraction Module, and for Phase 2 of the South Field Extraction System Module will be provided in addenda to this RA Work Plan, in conjunction with the pre final design packages for each of these modules.~~

2.3.1 Initiation of Remedial Activities

Section 120(e)(2) of CERCLA requires federal facilities to commence substantial, continuous physical on-site remedial actions no later than 15 months from ROD signature. As discussed above in Section 2.2, construction of several components of the aquifer restoration remedial action were initiated prior to signing the Operable Unit 5 ROD. These components include the South Plume Removal Action Module and extraction wells within the South Field Extraction System Module. The design approach contained in the RD Work Plan, the implementation schedule contained in this RA Work Plan, and the existing actions already underway for the Great Miami Aquifer establish the basis by which Operable Unit 5 meets the requirements of Section 120(e)(2) of CERCLA.

2.3.2 Completion of Remedial Action Activities

7 Subsection 300.435 (f)(1) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) describes completion of a remedial action as achieving the remedial action objectives and goals stated in the ROD. In accordance with the approved Operable Unit 5 ROD, remedial action completion for Aquifer Restoration is defined as having achieved the FRLs within the affected areas of the Great Miami Aquifer. The groundwater remedy performance monitoring necessary to certify completion of each module will be described in a future version of the Integrated Environmental Monitoring Plan (IEMP), which is Task 9 of the RD Work Plan (DOE 1996b). Achievement of the FRLs will be documented within Remedial Action Reports, which will be submitted as part of the IEMP reporting process.

DOE The Draft Baseline Remedial Strategy Report (DOE 1996a) includes an assessment of four aquifer restoration timeframes: 25, 15, 10 and 7.5 years. The preferred timeframe target, based on a comparison of shorter-term capital cost versus longer-term operational costs, is the 10-year timeframe. The projected 10-year time-frame is considered feasible because the FEMP's new ~~Ten Year Plan~~ accelerated clean-up plan for site-wide remediation allows quicker access to source control areas that will be remediated within the 10-year timeframe, rather than the 25 to 30 years anticipated during the Operable Unit 5 Feasibility Study (DOE 1995b). However, the actual site-wide cleanup time for the Great Miami Aquifer is contingent upon several factors that could affect the progress of the remedial action. These factors include (DOE 1996a):

- Uncertain hydraulic and geochemical constraints in the aquifer, such as
  - Hydraulic capacity, which can limit pumping rates needed to achieve desired aquifer drawdown profiles
  - Distribution coefficient, K_d, of the aquifer, which controls the amount of contaminant mass removal accompanying each pore volume exchange during restoration
  - Potential localized zones in the aquifer that, due to unique area-specific hydraulic and/or geochemical properties, may not clean up as readily
- The need to minimize hydraulic impacts at neighboring properties adjoining the FEMP (e.g., the Paddys Run Road Site, where a second groundwater plume is located)
- Injection rate and quality, where, in certain areas of high iron concentration in the Great Miami Aquifer and the presence of iron bacteria, the geochemical compatibility between water types when injecting water into the aquifer can cause a detrimental well-plugging problem

- Surface access for constructing extraction/injection well systems for plumes located underneath contaminated soil, source-area waste materials, and private property

Due to the uncertain degree of impact of these factors during full-scale remedy implementation, it is not possible to provide a specific date for completion of the aquifer restoration remedial action. (This constraint also applies to completion of the individual module-specific restoration areas that collectively comprise the remedial action.) Modeling projections and uncertainty analyses of the performance of the remedy do, however, indicate that it is feasible to restore the aquifer within 10 years, with an estimated range of cleanup time (due to uncertainties) of eight to 20 years (DOE 1996a).

Dismantlement and final disposition of the AWWT Facility and associated piping will occur when treatment of FEMP wastewaters is no longer necessary. This is dependent upon completion of site activities for projects under the other operable units, which will continue to generate contaminated stormwater runoff, contaminated perched groundwater, process water, decontamination reinstates, and leachate (from the On-Site Disposal Facility) throughout the site-wide remedial action. During post-remedial operation and maintenance, unknown quantities of leachate from the OSDF will be generated which may require treatment. However, continued use of the AWWT Facility is a post-remedial operation and maintenance activity, and is independent of the completion of aquifer restoration.

2.4 PROCUREMENT ISSUES AFFECTING SCHEDULE

The milestones listed in Table 2-1 are based on the premise that the subcontracts will be awarded without any procurement issues. However, such procurement issues, if they occur, could affect the actual award date of the subcontract. These issues, and FD-Fernald's response if they occur, follow:

- Lack of responsible interested bidders

  If, after advertising in the Commerce Business Daily and Local Plan Rooms, no interested prospective bidders are identified, the scope of work must be re-evaluated in light of the lack of bidders. Once the reason(s) for the lack of bidders is identified, then the scope of work will be revised, as appropriate, and re-advertised.

- No receipt of bids

  Failure to receive bids or failure to receive bids from a "responsive and responsible" bidder would preclude award of a contact, in which case FD-Fernald would re-bid the project.

- Unreasonably priced bids

  Failure to receive a reasonably priced bid, as determined by the independent FD-Fernald estimate, may delay award during estimate reconciliation and/or may preclude award if the estimate is determined to be accurate.

- Significant changes in government procurement requirements

  After advertising for bids, significant changes in government procurement requirements, laws, or regulations may be identified that change the procurement process. If this is the case, then the scope of work will be revised, as appropriate, and re-bid per the new requirements.

- Significant changes in site conditions

  If, after advertising for bids, a discovery of previously unknown site conditions is significant enough to change the scope of work, then the previous scope of work will be revised and re-advertised.

The above situations illustrate the effect that the bidding process can potentially have on the milestone schedule. Such procurement difficulties are not envisioned at this time; however, if they do arise and are of such significance that they affect compliance with the enforceable milestones contained in this document, then EPA and Ohio EPA will be notified to develop a mutually agreeable resolution.

2.5 OPERABLE UNIT INTEGRATION

The aquifer restoration remedial action consists of the close operation of two projects, the Aquifer Restoration Project and the AWWT and Wastewater Project. These two projects have been planned in conjunction to allow for adequate treatment of extracted groundwater. However, the success and timely completion of the aquifer restoration remedial action is also interdependent with other operable unit remedial action projects. This section summarizes the integration of the Aquifer Restoration Project and the AWWT and Wastewater Project with each other and with other site remedial action projects.

2.5.1 Aquifer Restoration and the AWWT and Wastewater Project

Most extracted groundwater will be treated via the AWWT and Wastewater Project within several treatment facilities -- the IAWWT, SPIT, AWWT Phase I, AWWT Phase II, and the AWWT Expansion. Extracted groundwater will be pumped to one or more of the following treatment facilities, or bypassed directly to the Great Miami River if treatment to meet mass or concentration based uranium discharge limits is not required:

IAWWT -- The IAWWT Facility was designed to treat uranium contaminated stormwater before the installation of the AWWT Phase I system. However, instead of being decommissioned, the IAWWT is now planned to be used for groundwater treatment.

SPIT -- The SPIT system was installed for the treatment of extracted groundwater and will continue to treat extracted groundwater.

AWWT Phase I -- The AWWT Phase I system is to be used primarily for treatment of uranium-STET contaminated stormwater runoff from the former production area; however, when no stormwater is available, this system will be used to treat the less contaminated groundwater from aquifer remediation.

AWWT Phase II -- The AWWT Phase II system is intended to treat the existing FEMP process wastewater and future remediation wastewater flows. However, in periods of low flows, some capacity is available to treat extracted groundwater.

AWWT Expansion -- The AWWT Expansion, when constructed, will be dedicated to extracted groundwater treatment.

2.5.2 AWWT and Wastewater Project and Other Projects

The AWWT Facility will also treat wastewaters other than extracted groundwater. Such wastewaters include controlled storm water runoff, decontamination wastewaters, OSDF leachate, and process wastewaters from the remedial activities for the other site projects. A Wastewater Integration Committee has been created to develop site-wide policy for coordinating the various wastewater streams that will need treatment from all other remedial action projects. The primary activities of this team are to obtain best estimates of wastewater quality and quantity as a basis for integrated planning and tracking, to develop AWWT acceptance guidelines, and to recommend priorities for treatment sequencing and facility upgrades.

2.5.3 Aquifer Restoration Project and Other Projects

The Aquifer Restoration Project consists of several area- and plume-specific restoration modules. Of these modules, Phase 2 of the South Field Module, the Waste Storage Area Module and the Plant 6 Module, are within source areas with planned remedial activities. The projects conducting remedial activities in these source areas are the Waste Pit Excavation Project (Operable Unit 1), the Soil Characterization and Excavation Project (Operable Unit 2), the D&D Project (Operable Unit 3), and the Fernald Residue Vitrification Project (Operable Unit 4). Because these areas cannot be accessed until the respective remedial activities have been completed, initiation (or followup Phase II wells in

the case of the South Field Extraction System Module) of these modules is dependent upon the completion of all the source-specific remedial activities.

2.6 CONSTRUCTION MANAGEMENT AND CONTROL

As the aquifer restoration remedial action components are constructed, it is necessary to use construction management practices to control the quality of the completed component. Such construction management practices include Configuration Management (Section 2.6.1), the Construction Subcontract Bid/Award and Procurement Strategy (Section 2.6.2), Construction Management (Section 2.6.3), and Construction Acceptance, System Shakedown, and Startup (Section 2.6.4), all of which follow existing FD-Fernald procedures and standard engineering and procurement practices.

2.6.1 Configuration Management

Configuration Management (CM) is the management process by which the technical baseline for projects are identified, graded, documented, tracked, and controlled. CM establishes consistency among the design requirements, physical configuration, and technical documentation, and will ensure this consistency is maintained throughout remedial action design, construction, operation, and D&D. CM also ensures the systematic evaluation, coordination, disposition, documentation, implementation, and verification of all changes, and their impact on cost, schedule, and technical baseline. The FEMP *Configuration Management Procedure (CM-0001)* along with the FEMP *Configuration Management Plan (PL-3035)* will be used as the CM guideline throughout the project. Performance Grades (PGs) will be established during design for all systems, structures, and components (SSCs) to ensure that these items receive the proper management and control. QA levels will then be established based on the assigned PGs for all SSCs and incorporated into the design specifications. QA for the remedial action will be in accordance with quality program elements identified in the FEMP QA Program (RM-0012).

2.6.2 Construction Subcontract Bid/Award and Procurement Strategy

Procurement and subcontract awards for all activities to support and implement the remedial action will generally be performed through fixed-price contracts. The acquisition system utilized at the FEMP is designed to ensure full and free competition among prospective proposers/bidders. In addition, the DOE procurement system requires a designation of a percentage of annual awards as

small, minority, or women-owned business set-asides. The following sections describe the construction subcontract bid/award and equipment/material procurement strategy for the aquifer restoration remedial action.

Construction Subcontractor Bid

Construction subcontractors for the aquifer restoration remedial action will be solicited competitively via Invitation for Bids (IFB). Sealed bids will be required to be submitted by potential subcontractors at a specified place, date, and time and will be opened publicly. The IFBs will be prepared following the remedial design process by the FEMP Planning and Bidding personnel with input from Construction, Engineering, H&S, QA, and Procurement personnel. The IFBs are made up of several parts including technical specifications and drawings, the PSHSP and training requirements, QA requirements, and statement of work (SOW). Development of a clear and complete IFB package will be the primary strategy to avoiding bid protests, minimizing change orders, and establishing the framework for compliance with construction quality acceptance requirements and H&S requirements, as well as ARAR and TBC compliance throughout the remedial action. As such, much attention will be given to the IFB package development, and more specifically the SOW.

Statement of Work

The SOW for each IFB package will define the activities that the subcontractors will be required to perform. Each SOW will identify project specific information and requirements and will detail the following:

- General Scope of Work
- Specific Description of Work
- Personnel and Environmental Safety
- Material, Equipment or Services Furnished by the FEMP
- Interfaces and Restraints
- Temporary Facilities and Utilities
- Site Location, Access, Laydown Areas, and Limits of Construction Area
- Work Hours
- Performance Schedule and Sequence of Work
- Pay Item Schedule
- Requirements for Subcontractor's Schedule
- Subcontract Progress Report
- Submittals
- Alignment and Kickoff Meeting.

Pre-Bid Meeting/Tour

Pre-Bid meetings will be conducted as necessary to adequately inform bidders and to mitigate schedule delaying bid protests and potential clarification requests during field activities. Prospective bidders for each IFB package will be provided the opportunity to attend a Pre-Bid meeting and work site tour. The Pre-Bid meeting is intended to allow an opportunity for all bidders to resolve questions about the IFB package, site policy, and existing site conditions.

Construction Subcontractor Award

The bids are reviewed to ensure that the apparent low bidder is both responsive and responsible relative to the terms and conditions of the IFB. Determination of responsiveness is based on proper completion of bid forms, acknowledgement of amendments, submission of the bid bond, and any other submittal requirements specifically identified in the IFB package. The bidders would be deemed responsible if they possess the capability and experience as required in the solicitation to perform the work in a safe and timely manner at the bid price. If the apparent low bidder is determined to be either non-responsive or non-responsible, the next lowest bidder will be evaluated. Following the determination that the apparent low bidder is responsive, the contracts administrator recommends and makes the final award.

Pre-Construction Alignment Meeting

Following each subcontract award and prior to the Notice to Proceed, a Pre-Construction Alignment Meeting will be held between subcontractor(s), DOE, A/E (if used), and FD-Fernald representatives and other appropriate site personnel. The objectives of this meeting is to establish relationships among all parties directly involved in the construction and to establish common goals and a joint execution plan to accomplish the contracted SOW. The meeting will emphasize the focus on safety, quality, regulatory compliance, and schedule throughout the project.

Equipment and Material Procurement

The majority of the standard support equipment and materials for the remedial action will be procured by the subcontractors performing the construction. Procurement of equipment and material will be in accordance with design specifications requirements as well as QA and other requirements included in each IFB package. Vendor data will be submitted by the subcontractor for engineer review to ensure design and specification requirements are achieved. Responsibility of procured equipment and

material will lie with the construction subcontractors until final construction acceptance and turnover to DOE.

2.6.3 Construction Management

FD-Fernald, as contracted by DOE at the FEMP, will directly oversee the subcontractors performing the remedial action construction and will be responsible for Construction Management during the remedial action. Construction Management will include, conducting construction status meetings, daily work surveillance and inspections, H&S oversight, Radiological and Industrial Hygiene monitoring/oversight, other construction responsibilities, and engineering services. The following sections expand on these Construction Management activities.

Construction Status Meetings

Upon the award of each subcontract, regularly scheduled weekly or bi-weekly construction status meetings will be conducted. These meetings are for the purpose of ensuring orderly and expeditious completion of the work and to provide coordination and communication between all parties involved. Attendees will generally include the DOE-FEMP project lead and technical support, Subcontractor, Construction, Engineering, and A/E personnel and other field oversight (safety, environmental compliance, etc.), management, and support personnel as warranted. These progress meetings will address action item status, project progress, deviations, Request for Clarification or Information (RCIs), Design Change Notices (DCNs), planning, schedule and budget status, safety items, and any concerns or potential problems. Meeting minutes identifying action items, project direction, and problem resolutions are produced, distributed, and filed.

In addition to the status meetings, the subcontractors will be required to submit a Daily Report. The Daily Report covers the previous day's work status and identifies any safety problems encountered, description of work performed, associated problems and subsequent resolutions. Reports are maintained in the project file.

Surveillance and Inspections

In addition to review of Daily Reports throughout the remedial action construction, inspection and surveillance of the subcontractor work will be conducted by Construction and QC Engineers with support from the A/E and Engineering representatives. The surveillances and inspections will verify

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that the remedial design and associated specifications are being properly implemented and contract requirements are being satisfied. If deficiencies are noted, the subcontractor shall be notified immediately so that the necessary corrective actions can be taken as soon as possible. Failure of the subcontractor to satisfactorily correct deficiencies may constitute cause to stop work. Situations where there is an immediate danger to life, health, or the environment will be cause for immediate work stoppage until corrective action is completed.

Independent QA/QC inspection and testing by QC personnel assigned to the project will also occur in accordance with the applicable QA plan.

Health and Safety Oversight

Full time FEMP H&S representatives will be assigned to the project. While all subcontract personnel are responsible for following all safety requirements of the Project Specific Health and Safety Plans (PSHSPs), the H&S personnel will perform periodic audits of the H&S program to ensure compliance. The H&S personnel assigned to the project will be the single point of contact for all safety, industrial hygiene, fire protection, and radiological issues or concerns. The H&S personnel will also be responsible for ensuring that all H&S programs and issues are implemented and addressed in the field and will be responsible for performing periodic audits of the work in progress as well as having stop-work authority until the proper corrective action is taken.

In addition to FEMP H&S personnel assigned to the project, each subcontractor will provide a H&S field representative who shall be responsible for ensuring the subcontractor's compliance with all H&S requirements. The subcontractor H&S representative shall report all safety concerns and incidents to the Construction Manager or Project Manager.

Prior to the start of each subcontractor work scope, a pre-work/kick-off safety meeting will be conducted by the FEMP H&S personnel. All personnel involved in the construction field activities will be given a safety briefing prior to receiving authorization to begin work. Safety meetings with field personnel will then be conducted on a weekly basis throughout a given contract by the H&S personnel.

Radiological and Industrial Hygiene Monitoring/Oversight

Radiological and Industrial Hygiene (IH) Technicians will be assigned to the project. In conjunction with the H&S personnel assigned to the project, the Radiological and IH Technicians will help to ensure radiological and industrial hygiene compliance throughout the project. Radiological compliance includes the radiological monitoring of equipment and materials entering and leaving the job site, radiological monitoring of soil during well drilling and pipeline installations to help ensure proper segregation, storage, or disposition; Radiation Work Permit compliance, routine inspection, monitoring, and recording of radiation detection monitors, and radiological monitoring of personnel. IH compliance includes confined space entry permits, chemical and hazardous waste work permits, evaluating proper construction personnel protection to be used on the job, and evaluating noise exposure. The PSHSP will be the basis for the required radiological and industrial hygiene monitoring and will identify the action levels that trigger a stop-work occurrence.

Construction Responsibilities

In addition to the oversight activities detailed above, Construction Management functions will include, but are not limited to, processing subcontractor RCI, issuing DCNs, controlling and distributing subcontractor submittals for review (*i.e.*, shop drawings, vendor data, etc.), maintaining red-line construction drawings, collecting construction turnover documentation (including equipment manuals, test reports, *etc.*), maintaining project files, review of subcontractor progress reports, coordination and completion of Construction Acceptance Testing (CAT) prior to final construction turnover.

Engineering Services During Construction

Title III Engineering Services are those activities required to assure that the project is constructed in accordance with the plans and specifications. Office and field engineering personnel will be assigned to the project and will be responsible for performing the work as described below.

Engineering Support -- The engineer will be responsible for the review and approval of all shop drawings, calculations, and vendor data submitted by the subcontractors for compliance with design and specification requirements. The engineer will be responsible for reviewing and responding to RCIs and DCNs as requested by Construction. In addition, as-built design drawings will be produced by the engineer based on the red-line drawings from the field.

Field Support -- The engineer will provide field representatives during construction activities to act as an interface between the field and the office. The field representatives will help ensure correct design requirement interpretation by the subcontractors, expedite RCI and DCN responses and identify potential design impacts due to proposed changes, and assist with documenting field

design changes and maintaining red-line drawings. In addition, the field representatives will support Construction Engineers during surveillance and inspection activities of subcontractor work.

2.6.4 Construction Acceptance, System Shakedown, and Start-up

As each subcontracted construction package nears completion, the Construction Acceptance process begins. Construction Acceptance of each construction package, Systems Operability Testing (SOT)/Shakedown, and Facility Start-up will be in accordance with applicable FEMP site procedures. The procedures are intended to allow for an orderly transfer of the constructed facilities from construction management to the start-up and operating responsibility. The following sections describe each step in more detail.

Construction Acceptance Testing

Construction Acceptance Testing (CAT) is the performance of all necessary testing to demonstrate that subcontractor supplied or installed equipment and systems will operate satisfactorily and safely in accordance with the remedial design and specifications. Testing encompasses hydrostatic, pneumatic, electrical, ventilation, and mechanical functioning of individual pieces of equipment, portions of systems, or systems as a whole.

CAT criteria will be specified in the contract design specifications for the subcontractors and will serve as the basis for CAT acceptance. Each subcontractor is responsible for conducting CAT for their scope of work, in accordance with the acceptance criteria set forth, making corrective actions where necessary. CAT will be witnessed, recorded, and approved by Construction Engineers, QA personnel, Start-up/Operations personnel, and A/E personnel as warranted.

Pre-Final Inspection/Conditional Acceptance

At or near completion of CAT for each construction package, the pre-final inspection will occur. The pre-final inspection is the survey of a facility or area of work to determine the status of its acceptability relative to the remedial design and contract documents. The pre-final inspection will consist of a walk-through inspection by the responsible construction, start-up/operations, A/E (if used), and project personnel. Pre-final inspection will usually result in the Conditional Acceptance of a facility or work area from the subcontractor with a documented list (punchlist) of specific work remaining, including subcontractor submittals, and a schedule for completion of the remaining items.

Final Inspection/Acceptance

Upon completion of punchlist items, a final inspection walk-through will be performed. Participants will usually be the same as those during the pre-final inspection. The punchlist will be used as the inspection checklist whereby the acceptance of all significant listed items will be verified and documented. The signed-off checklist by subcontractor, construction, start-up/operations, and appropriate project personnel will serve as final construction acceptance and certification document.

Construction Turnover

Construction acceptance and subcontractor turnover of each construction package will occur throughout construction. As the project progresses and construction subcontracts are completed, a construction turnover package for the project as a whole will be compiled. Included will be such items as CAT results, construction completion certifications, equipment and system manuals, approved subcontractor submittals, red-line design drawings and all documented field changes. Construction turnover will signify the transfer of responsibility from construction to start-up and operations.

Systems Operability Testing/Shakedown

Start-up Plans will be developed in accordance with the latest version *FEMP Startup and Turnover Requirements Manual*. The Start-up Plan will identify all required start-up activities including the following:

- Preparation and approval of plans, specifications, and procedures for SOT of the facility
- Preparation of Standard Operating Procedures and Preventative Maintenance Procedures
- Preparation and approval of the instructional (training) materials for operational and maintenance needs
- Supporting classroom and On-the-Job training of operators
- Verification that performance of the system(s) meets design requirements
- Determination of optimum operating parameters
- Identification of problems that may adversely affect operational reliability
- Resolution of deficiencies encountered.

SOT will be defined in detail by a SOT Plan and SOT specifications and performed in accordance with SOT Procedures. The testing activities to be included in the SOT are:

- Instrument and control component calibration and checkout
- Area and process monitoring equipment calibration and checkout
- Electrical and Mechanical equipment operational performance testing
- System operational performance testing
- Safety interlock testing
- Alarm systems performance testing.

Upon successful completion of SOT, the operational systems will be shutdown according to the SOT Safe Shutdown Procedure until operations can begin. Post SOT activities include the completion of SOT documentation such as the SOT Report. SOT completion, along with the completion of all other identified start-up activities necessary to achieve the point of operational readiness, is a prerequisite for the SSR process that follows.

Standard Startup Review

All present aquifer restoration remedial action projects have been classified as either Standard Industrial Hazards or Radiological Facilities of less than Category 3. Therefore, all aquifer restoration remedial action projects have been determined to be subject to Standard Startup Reviews (SSR) for operational readiness in accordance with the FEMP Pre-Operational Assessment Program (RM-0025). The SSR process provides a systemic approach for verifying that planned actions are complete and are documented to demonstrate that a state of readiness has been achieved when the rigors of an Operational Readiness Review (ORR) or Readiness Assessment is not appropriate. The purpose of the SSR process is to obtain assurance that a facility:

- Is prepared for start-up and is properly and adequately documented
- Will be operated, maintained, and supported by trained, qualified, and authorized personnel
- Will be operated in conformance with applicable DOE Orders and regulatory requirements
- Has adequate plant equipment, structures, and other hardware
- Includes adequate, approved operating procedures
- Has the sitewide support systems identified, in place, and functional
- Is in compliance with ARARs and commitments made in the applicable safety analysis and any technical safety requirements outlined in the safety analysis

- Will be operated so that no undue risk to employees, the public, or the environment results.

The SSR process may be implemented using either an SSR Team or through other assessment activities such as a checklist. SSRs will be performed using a graded approach commensurate with the safety significance of the activity/project, complexity, and cost. The SSR Team, or SSR Leader in the case of a checklist, will determine the project's readiness relative to the items listed above and to document its findings. Identified deficiencies will then be scheduled for correction or completion prior to actual start-up operations. The approval authority for start-up operations is with the local DOE Field Office.

3.0 PROJECT PERMIT REQUIREMENTS

DOE This section describes the primary applicable regulatory requirements for implementing the aquifer restoration remedial action. Included in this section is discussion of the permits necessary to conduct the remedial action, as well as the permits exempted for on-site activities. Compliance with these permit-related requirements and all other ARARs pertinent to aquifer restoration will be described in the Permitting Crosswalk in the O&M Plan, which is a deliverable (Task 2) under the RAWP.

3.1 NPDES PERMIT

DOE-FEMP, U.S. EPA, and Ohio EPA have agreed that off-site discharges of process wastewater and stormwater associated with CERCLA remedial actions conducted at the Fernald Site will be subject to compliance with both substantive and administrative provisions of Ohio EPA's NPDES permit program. Groundwater and wastewaters generated during the remedial actions at the FEMP that are treated through the AWWT Facility will be discharged to the Great Miami River. This discharge is permitted by the existing site NPDES permit (OEPA Permit No. 1IO00004*ED). As necessary, applications for permit modifications will be submitted to address additional wastewater discharges from remedial activities.

3.2 AIR AND WATER PERMITS

Some of the wastewater treatment units associated with the AWWT Facility currently have air and water Permits-to-Install (PTIs) and Air Permits-to-Operate (PTOs) issued by the Ohio EPA. However, DOE, FD-Fernald, and Ohio EPA have agreed that the AWWT Facility is part of a CERCLA action and is therefore not subject to the administrative permit requirements. Therefore, the current air and water PTIs and PTOs will not be renewed upon expiration. Compliance with substantive permit requirements of these expired PTIs and PTOs will be incorporated into the design and operation of the AWWT Facility, and will be included in the Permitting Crosswalk in the O&M Plan (Task 2 of the RD Work Plan) and the Permit Information Summary for the AWWT Facility Expansion (a design support deliverable per the RD Work Plan).

3.3 CULTURAL RESOURCE COMPLIANCE

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of their actions on properties that are on, are eligible for inclusion on, the National

Register of Historic Places. Therefore, any planned surface disturbance activities in non-controlled areas at the FEMP must be preceded by a cultural resources survey to determine the existence of potentially significant historic or archaeological resources. Most of the injection/extraction modules for aquifer restoration are already in areas which have undergone a cultural resources survey or that have been previously disturbed due to remedial activities. However, if cultural resources are encountered during excavation for pipeline installation or during well drilling activities, mitigative actions will be implemented in accordance with Section 106 of the NHPA and the FEMP procedure for unexpected discoveries of cultural resources.

In addition to the NHPA, DOE must comply with the Native American Graves Protection and Repatriation Act (NAGPRA). If Native American human remains, associated funerary objects, unassociated funerary objects, sacred objects, or objects of cultural patrimony are discovered, DOE will consult with all likely culturally affiliated tribes to determine an appropriate disposition for the remains. Inadvertent discoveries require a 30-day shutdown within the impacted area, while consultation takes place. DOE is currently seeking a memorandum of agreement with all likely culturally affiliated tribes to avoid the 30-day shutdown requirement.

8 3.4 UNDERGROUND INJECTION CONTROL PERMIT PROGRAM

The wells used for the Injection Demonstration (Task 4 of the RDWP) and the South Field Injection System Module (if implemented) meet the definition of an underground injection well subject to Ohio regulations for the Underground Injection Control (UIC) Program (OAC 3745-34). The injection well classification in this case is determined by the intent of the injection and the source water used as injectate. The purpose of the Injection Demonstration is to facilitate and enhance groundwater extraction. Currently, only treated groundwater will be used as the injection water. As such, these wells are classified as Class V injection wells [OAC 3745-34-04(E)]. All of the planned injection well locations will be on-site. Remedial actions conducted entirely on-site are exempt, under CERCLA and the NCP [40 CFR 300.400(e)], from the administrative requirements of obtaining environmental permits. Compliance with the substantive permit requirements for well drilling and well operation will be incorporated into the design of the injection system and will be included in the Permitting Crosswalk in the O&M Plan (Task 2 of the RD Work Plan).

4.0 SAMPLING AND ANALYSIS REQUIREMENTS

Project specific sampling and analysis requirements for the Aquifer Restoration and the AWWT Facility Projects are encompassed in the IEMP and the O&M Plan, both of which are deliverables under the Operable Unit 5 RD Work Plan. The IEMP (Task 9 in the RD Work Plan), includes remedy performance monitoring for the aquifer restoration and NPDES Permit monitoring for the AWWT Facility discharge into the Great Miami River. The O&M Plan, Task 2, includes provisions for obtaining process flow samples within the AWWT Facility to ensure that proper operations are maintained.

5.0 HEALTH AND SAFETY/CONTINGENCY PLAN REQUIREMENTS

All activities conducted within the confines of the Aquifer Restoration and AWWT and Wastewater Projects are governed by the requirements of the Safety Performance Requirements Manual, (RM-0021) which addresses environmental, occupational, industrial, and construction health and safety for the FEMP site as a whole. In addition to these general requirements, task specific H&S requirements are included in Project Specific Health and Safety Plans (PSHSPs), which will be prepared for each distinct construction activity.

All DOE and FD-Fernald employees, visitors, vendors, contractors, and subcontractors are required to abide by the provisions of applicable H&S plans. Management and supervisors have the responsibility for assuring that the requirements of the applicable H&S plans are met. Occupational Safety and Health field personnel (Technicians, Specialists and Engineers) have the authority to enforce the requirements of the applicable H&S plans. All personnel have stop-work authority for imminent safety hazards and noncompliance with the applicable H&S plans.

5.1 PROJECT SPECIFIC HEALTH AND SAFETY PLANS

PSHSPs will be developed as required by FEMP Procedure SH-0001, "Developing Project Specific H&S Plans" for all construction activities. An H&S Requirements Matrix is developed and used in conjunction with the PSHSP. Each PSHSP will focus on a specific scope of work and will cover specifically identified tasks identified in a H&S Requirements Matrix.

As each module design package nears completion, one or more H&S Requirement Matrix and PSHSP may be developed covering each distinct or related construction activity. The applicable PSHSPs will be included in each subcontract IFB package and will be the governing plan that the subcontractor is required to follow. This strategy results in the development of multiple PSHSPs, which is dependent on the number of subcontracts awarded. Due to this strategy, DOE proposes to submit PSHSPs to EPA for informational purposes only as specifically requested by the agency. All PSHSPs will be maintained at the project site, with controlled copies in the project document control files.

5.2 CONTINGENCY PLAN

The contingency plan for the remedial action activities is covered by the current FEMP emergency plan. The FEMP has produced the Emergency Plan (PL-3020) that addresses the emergency management program, provides guidance for all emergency responders (including employees), ensure adequate performance for critical systems, and meets regulatory requirements.

The FEMP also has an established emergency organization available 24 hours a day to respond to all emergencies and abnormal events. The emergency organization includes FEMP personnel and resources as well as those of the local community. This group of trained personnel can be quickly expanded and reinforced as necessary to respond to any potential emergency. Members of the emergency organization undergo a formal training program including participation in site-wide drills and exercises.

The Emergency Preparedness and Public Affairs groups at the FEMP maintain several ways to inform state and local groups about emergency preparedness and response. Meetings between the state, county, and local government agencies, emergency response personnel and FEMP are held on a regular basis at Cooperative Planning and Training Committee meetings hosted by the FEMP Emergency Preparedness organization. These meetings provide a forum for these agencies to discuss issues related to response, communications, information sharing, available training, drills and exercises. An emergency planning brochure is distributed annually to the Emergency Planning Zone population on what to expect and what to do in the event of an emergency at the site. A speakers' bureau managed by Public Affairs group also includes emergency preparedness and response subjects in presentations given to various area group.

Drills and exercises are conducted at the FEMP to provide emergency response personnel the opportunity to practice and test the effectiveness of emergency plans, procedures, and training. A program of drills and exercises, integrated with the training program, are implemented to develop, maintain and test emergency response capability; identify areas for improvement; and to serve as a planning basis by indicating areas of improvement.

The FEMP also maintains mutual aid agreements with local fire, ambulance, law enforcement, and medical services. These offsite agencies and groups provide reinforcement to FEMP emergency

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responders and extended medical facilities. Communications, site assessment, fire, medical, monitoring equipment, and all necessary emergency phone numbers are also provided in the FEMP emergency plan.

6.0 OPERATIONS AND MAINTENANCE PLANNING REQUIREMENTS

DOE Operations & Maintenance (O&M) planning requirements are encompassed within the O&M Plan, which is a deliverable under the Operable Unit 5 RD Work Plan. Per the RD Work Plan, the O&M Plan will be submitted to EPA and Ohio EPA by July 1, 1997. The O&M Plan (Task 2 in the RD Work Plan), covers operation and maintenance activities for the extraction/injection well systems and associated transport lines, and the AWWT Facility ~~and the groundwater monitoring wells~~.

7.0 GROUNDWATER MONITORING

Groundwater monitoring is encompassed within the IEMP, which is a deliverable under the RD Work Plan (Task 9). It is anticipated that the IEMP will be finalized and implemented in 1997. The groundwater monitoring portion of the IEMP includes monitoring aquifer remedy performance and groundwater contaminant plume conditions, the On-Site Disposal Facility, and other groundwater monitoring as required by various regulatory requirements. It is currently envisioned that the IEMP reporting process will incorporate the Remedial Action Reports that document FRL achievement and cleanup certification for each aquifer restoration remedial action module.

8.0 COMMUNITY RELATIONS

DOE As a Superfund site, Fernald must comply with certain requirements for informing and involving the public. The *Community Relations Plan* (CRP) for the FEMP, Revision 4, provides details about how management will involve the public in decisions related to the site during the remedial design, remedial action and post-remedial operation and maintenance ~~O&M~~ phases. ~~Under the remedial design and remedial action phases, requirements are limited to revising the CRP, if determined necessary by the lead agency (DOE), and notifying the public at the beginning of the remedial design stage prior to implementation of the remedial action phase.~~ The CRP is designed to comply with the public participation requirements in the NCP and its empowering legislation, CERCLA. It also reflects EPA guidance in *Community Relations in Superfund: A Handbook* (January 1992). The CRP sets forth activities under the Amended Consent Agreement between DOE and EPA. The CRP also complies with the requirements of all applicable laws and regulations, including the National Environmental Policy Act (NEPA) and the Federal Facilities Compliance Act (FFCA) ~~NEPA and the FFCA~~.

The CRP was revised in September/October 1994. The Ohio EPA approved the revised CRP in December 1994, and the EPA approved the CRP in January 1995. Throughout the duration of Fernald remediation activities, the CRP may be revised to reflect changing community concerns, as well as changes in the law, regulations or regulatory agreements. The relevant required and supplemental public involvement activities set forth in the CRP are described below.

***Required* Public Involvement Activities During Remedial Design and Remedial Action**

The ~~following~~ activities ~~are~~ required during the remedial design and remedial action ~~RD and RA~~ process are limited to the following:

- Prepare a fact sheet describing the remedial design upon completion of the final engineering design for each design package [NCP 300.435].
- Provide a public briefing upon completion of the final engineering design and prior to the beginning of the remedial action [NCP 300.435].
- ~~Publish in a local newspaper of general distribution a *Notice of Availability* of documents submitted to the EPA under the remedial design and remedial action [DOE commitment/directive].~~

Throughout the remedial design and remedial action phases, the public will be informed of the status of remedial design and remedial action activity schedules and progress, as well as any new findings or significant developments. Upon submittal of the draft and final RA Work Plans to EPA, key stakeholders, such as community leaders and members of the Fernald Citizens Task Force and F.R.E.S.H. Inc., will be informed of the documents' availability for inspection. Informal public notices will be issued by DOE (postcard mailings, phone calls to key stakeholders, etc.) announcing document availability and encouraging public inspection of key documents submitted to the EPA and the OEPA under the remedial design and remedial action phases ~~at the Public Environmental Information Center (PEIC)~~.

Key documents will continue to be placed in the FEMP's Public Environmental Information Center (PEIC). The PEIC is located in the JAMTEK Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio (513-738-0165). The PEIC is open~~:~~ from 7:30 a.m. to 7:00 p.m. on Monday; 7:30 a.m. to 5:00 p.m. on ~~and Thursday, 9 a.m. to 7 p.m.;~~ Tuesdays, Wednesdays, and Thursdays; and from 7:30 a.m. to 4:30 p.m. on Fridays. The PEIC is closed on weekends. ~~Friday, 9 a.m. to 4:30 p.m.; and Saturday, 9 a.m. to 1 p.m.~~

During the remedial design and remedial action phases, the DOE is committed to providing opportunities for public involvement and public input into the decision making process beyond those required by law. When practicable, the DOE ~~Aquifer Restoration Project management~~ has and will continue to offer public involvement opportunities -- surpassing regulatory requirements -- throughout the remedial design/remedial action and post-remedial operation and maintenance phases of Fernald site cleanup. These opportunities include public workshops and community roundtable discussions to be arranged and facilitated by the DOE-FEMP as requested by key stakeholders or other members of the public in need of further information, explanation, or clarification. As warranted by DOE, a public briefing will also be held to discuss the aquifer restoration remedial action to be undertaken. At a minimum, these opportunities will reflect regulatory requirements, as well as DOE's commitments for public involvement at Fernald.

Supplemental Public Involvement Activities

Following are examples of some supplemental public involvement activities which may be conducted during the aquifer restoration remedial design and remedial action:

Public meetings	Media relations
Public information and notification	Written materials and video stories
Fernald Visitors Bureau (tours and speakers)	Fernald Precollege Education Outreach programs
Presentations to interested community groups and elected officials	~~When appropriate, environmental education programs~~

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