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Environmental Restoration Program

REMOVAL ACTION WORK PLAN OPERABLE UNIT 4, MIAMI-ERIE CANAL

MOUND PLANT
MIAMISBURG, OHIO

Preliminary Review

August 1995

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

MIAMISBURG
AREA OFFICE

Department of Energy

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AUG 21 1995

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Mr. Brian Nickel
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Dayton, Ohio 45402-2911

Dear Mr. Fischer and Mr. Nickel:

RE: OU4, Miami-Erie Canal Removal Action Work Plan

Attached for your use is the OU4, Miami-Erie Canal Removal Action Work Plan. This document describes the technical approach for the removal action and serves as the project planning document for review and comment by the stakeholders.

As discussed with the OU4 MAC member, when the clean-up Standards were being developed, a copy of this draft will be placed in the Public Reading Room for their input into the Work Plan.

Should you have any questions concerning this document, please contact Ron Church at (513) 865-3548.

Sincerely,

Arthur W. Kleinrath
Project Engineer Team Leader

Attachment

cc w/attachment:
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ACRONYMS

ALARA	As Low As Reasonably Achievable
AM	Action Memorandum
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DOE	Department of Energy
DOT	Department of Transportation
EE/CA	Engineering Evaluation/Cost Analysis
EG&G	EG&G Mound Applied Technologies
EPA	Environmental Protection Agency
ER	Environmental Restoration
FFA	Federal Facilities Agreement
FIDLER	Field Instrument for the Detection of Low Energy Radiation
FSM	Field Sampling Manager
FSP	Field Sampling Plan
H-3	Tritium
HSP	Health and Safety Plan
IDM	Investigative Derived Material
LLW	Low Level Waste
MAC	Mound Action Committee
MCL	Maximum Contaminant Level
nCi/g	Nanocuries per gram
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NTS	Nevada Test Site
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Environmental Response (EPA)
OU	Operable Unit
pCi/g	picocuries per gram
PPE	Personal Protective Equipment
Pu-238	Plutonium-238
QAPjP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSE	Removal Site Evaluation
RWP	Radiation Work Permit
SAFER	Streamlined Approach for Environmental Restoration
SCA	Soil Contamination Area
SOP	Standard Operating Procedure

ACRONYMS (continued)

TBC	To Be Considered
TCLP	Toxicity Characteristics Leaching Procedure
Th-230	Thorium-230
U-238	Uranium-238
WM	Waste Management

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The Operable Unit (OU) 4 Miami-Erie Canal Removal Action Work Plan provides the implementation procedures for performing a non-time critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for a portion of the Canal and associated waterways adjacent to Mound Plant containing plutonium-contaminated soils.

OU4 is located immediately west of Mound Plant in the City of Miamisburg, Ohio. It includes the watershed occupied by the former Miami-Erie Canal, the Drainage Ditch from Mound Plant Property to the Canal, the overflow creek from the Canal to the Great Miami River, the runoff hollow between the Canal and Mound Plant boundary, and the South Pond located in the Community Park.

As a result of a pipe rupture and stormwater runoff from Mound Plant in 1969, plutonium-contaminated soils were deposited in the sediments of OU4. Subsequent sediment deposits carried offsite by Mound Plant drainage have covered the contaminated sediments.

Sampling studies identified concentrations of plutonium-238 in the Canal ranging up to 4560 picocuries per gram (pCi/g), with an average value of approximately 530 pCi/g (DOE 1994).

DOE has determined, with input from Mound Stakeholders (representatives from DOE, the City of Miamisburg, EPA, public interest groups, and individuals), that the goal of the removal action is to remove soils and sediments contaminated by plutonium-238 at concentrations exceeding 75 pCi/g. Based on this goal, all available data indicate that only the North and South canal, and the offsite portions of the Mound Plant Drainage Ditch, will fall within the scope of this removal action.

A conceptual model was prepared detailing the conditions expected to be encountered at the site including nature, location, and extent of contamination. The Work Plan strategy was screened under the Streamlined Approach For Environmental Restoration (SAFER) program to provide contingency plans in the event that the site conditions vary from the expected conditions. As a result of these preparations, a design basis was established for excavation, waste management, and disposal of contaminated soils for this removal action. The removal action will be performed in accordance with this Work Plan under the lead of the ER CERCLA program.

The removal action design is based on a set of anticipated site conditions. These conditions are considered normal for soil excavation at this site. However, it is possible that deviations from one or more of the expected site conditions will occur. For this reason, a detailed uncertainty analysis has been prepared to provide contingency planning for this removal action. The uncertainty analysis clearly specifies the expected site conditions, potential deviations from these conditions, methods to monitor deviations, and contingency plans for site personnel to follow if deviations are noted. Contingency plans for the higher risk deviations form the basis for the removal action "expected approach."

The removal action design is a series of phased excavations along the Canal and Drainage Ditch pathways. Prior to actual soil removal, the site will be cleared of all trash, brush, and trees, and the remaining surface will be monitored and sampled to confirm soil locations to be excavated. The removal action "expected approach" requires completion of the following additional project tasks:

- Offsite Drainage Reroute -- to present site drainage flow from entering the South Canal to permit work in the Canal bed,

- Access Road Extension -- to provide a non-public-access transportation route for vehicles carrying excavated soil from OU4 to a staging area located on Mound Plant, and

- Rail Spur Upgrade - to provide rail access from Mound Plant to existing Conrail lines, thereby allowing rail transport of waste to an approved disposal site.

Once the site has been prepared, the selected area will be excavated using earthmoving equipment and the soils will be placed into disposal bags called "supersacks". The supersacks will be transported to Mound Plant where they will be staged and loaded onto railcars for shipment to an approved disposal site.

During the removal action, the materials excavated from the site (including soil, sediments, and debris) will be field monitored for radiological and chemical contamination. Field instruments will be used to scan exposed excavation surfaces to ensure that worker health and safety limits are not exceeded.

Once the excavation is complete, extensive sampling will be undertaken to verify that the cleanup goal has been achieved. The site will then be backfilled with clean fill to the pre-removal grade. Equipment and vehicles used during the removal action will be decontaminated and demobilized.

The removal action is expected to require between one and three years to complete at an estimated cost of $18 million (± 30%).

1. INTRODUCTION

EG&G Mound Applied Technologies, Inc. (EG&G) operates the U.S. Department of Energy (DOE) Mound Plant under prime contract with the DOE. Mound Plant was placed on the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, i.e., Superfund) National Priorities List (NPL) in 1989 and subsequently a Federal Facilities Agreement (FFA) was established between DOE, U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA). Operable Unit (OU) 4 addresses contamination of the Miami-Erie Canal which is located off of the Mound Plant site in Miamisburg, Ohio. The primary contaminant of concern is plutonium-238 in the soils of OU4.

1.1. PURPOSE

The purposes of this Work Plan are to 1) provide the technical approach for conducting a removal action at OU4 in accordance with CERCLA requirements, 2) clearly define the activities which need to be conducted so the removal action achieves the cleanup goal, and 3) serve as the project planning document for review and input by the OU4 Stakeholders.

1.2. WORK PLAN FORMAT

The remainder of Section 1 of this Work Plan summarizes the background of OU4, the work performed to date documenting the requirements for conducting a non-time critical removal action under CERCLA, and the objectives of the Work Plan.

Section 2 provides the conceptual model for the OU4 removal action project as well as a detailed uncertainty analysis prepared under the Streamlined Approach for Environmental Restoration (SAFER) method.

Section 3 outlines the design basis for conducting the removal action, including applicable or relevant and appropriate requirements (ARARs) and cleanup criteria, as established by the Mound Stakeholders.

Section 4 details the specific activities required to perform the removal action, including site preparation, mobilization, soil excavation, waste management and disposal, and site restoration.

Section 5 addresses the sampling requirements of the removal action during excavation/waste management activities and as part of the post removal verification.

Sections 6, 7 and 8 provide brief discussions of the OU4 Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPjP), and Health and Safety Plan (HSP), respectively.

Section 9 describes activities related to, but distinctly separate from, the OU4 removal action project. These activities include the community relations plan, access road project, site drainage reroute plan, and railroad spur upgrade project, all of which will be implemented prior to beginning the removal action activities.

Section 10 summarizes the removal action project organization using a DOE/EG&G/Contractor organizational chart and a brief discussion of the project performance methodology using either currently available resources at Mound Plant or outside contractors.

Section 11 provides a summarized project schedule for the removal action and activities related to the performance of the removal action.

Section 12 summarizes the cost estimates for conducting the various aspects of the removal action.

Section 13 lists the references used to prepare this Work Plan.

Appendix A is a copy of the exemption memorandum which allows waste generated from OU4 to be disposed of at a commercial disposal facility. Appendices B, C, and D are annotated outlines of the FSP, QAPjP, and HSP, respectively. Appendix E is a table showing the ARARs screening process for OU4.

1.3. BACKGROUND

In 1969, a Mound Plant underground pipeline carrying plutonium-238 in a nitric acid solution ruptured, releasing plutonium to the surrounding soils. During remediation, a rainstorm washed some of the contaminated soils and sediments through natural drainage pathways into the Miami-Erie Canal. In 1974 Mound Plant performed a comprehensive study (Rogers 1995) to determine the impact of the plutonium contamination on the Canal and surrounding waterways. The results of the 1974 study indicated that the

plutonium contamination, which was measured down to depths of about five feet in sediments of the Canal, did not present a human health or environmental hazard.

Subsequent environmental monitoring and studies, including the 1992 - 1993 study by the Agency for Toxic Substances and Disease Registry (ATSDR 1993), have supported the findings of the 1974 study that the Canal contamination does not pose a public health hazard under the current land use and ownership. In 1993, the DOE determined that a removal action was warranted due to the change in mission for the Mound Plant and the potential for future change in the Canal land use and ownership. A removal action involving excavation and off-site disposal of plutonium-contaminated soil was recommended, and is the subject of this Work Plan.

In 1993, a Special Canal Sampling Study (DOE 1993a) was performed to determine whether chemical contamination exists in the Canal soils which would require the excavated soils to be classified as mixed hazardous waste. Results of the study indicated that although some chemical contamination exists, it occurs at low levels and is probably from sources other than Mound Plant. In addition, the Special Canal Sampling Study confirmed the radionuclide sampling results indicated by the past studies at OU4.

Further details concerning the background of OU4 can be found in the Removal Site Evaluation (RSE) (DOE 1993b).

The decision to perform a removal action was further supported by Stakeholders' input to the DOE that led to a cleanup goal which requires excavation of soils with concentrations of plutonium-238 greater than 75 picocuries per gram (pCi/g).

1.4. OBJECTIVES

The objectives of this OU4 Removal Action Work Plan are as follows:

- To provide the current status of the removal action activities at OU4;
- To advise the Mound Stakeholders of the expected conditions, the potential unexpected conditions, and the proposed responses to the likely deviations from the expected conditions relating to the OU4 removal action;

- To advise the Stakeholders of the specific tasks to be implemented for the removal action and at what specific locations;

- To expand on the removal action alternative recommended in the Engineering Evaluation/Cost Analysis (EE/CA) (DOE 1995a) in sufficient detail to serve as the framework for implementing the removal action; and

- To serve as a mechanism for developing details of the removal action, such as the design, FSP, QAPjP and the HSP.

1.5. RSE; EE/CA; AM DESCRIPTION

In 1993, DOE prepared an RSE (DOE 1993b) to determine the need for a removal action in the Miami-Erie Canal. The report concluded that there was no current human health threat and, on this basis, a removal action was not warranted. However, the DOE decision to change the mission of the Mound Plant could result in a future change in land use and ownership of the Canal, which could alter the human health risk evaluation. On this basis, DOE recommended performing a removal action in the Miami-Erie Canal.

In 1995, an EE/CA (DOE 1995a) was completed which evaluated five removal action alternatives on the basis of effectiveness, implementability and cost. Of the alternatives (1-No Action, 2-Institutional Controls, 3-Containment, 4-Excavation and Disposal, and 5-Excavation, Treatment and Disposal), alternative 4-Excavation and Disposal was recommended for OU4.

In 1995, an Action Memorandum (AM) (DOE 1995b) was prepared to document DOE's selection of the removal action alternative for OU4.

2. CONCEPTUAL MODEL

A conceptual model of the OU4 removal action is presented in this section. The conceptual model is used as a decision tool during the planning and implementation of the removal action. The DOE SAFER program provided guidance and assistance in developing the decision model to help expedite the removal action.

The conceptual model includes the expected conditions associated with the removal action, a problem statement describing the intent of the removal action, and the uncertainty analysis. The uncertainty analysis identifies the potential deviations from the expected conditions that may arise during the removal action, the techniques used to monitor the potential deviations, the contingency plans for responding to deviations, and the probability of whether or not deviations will occur.

2.1. EXISTING INFORMATION

Available information on OU4 includes previous field sampling (DOE 1993a and DOE 1994), documents submitted in accordance with National Contingency Plan (NCP) requirements for non-time critical removal actions, and the results of public participation activities. A summary of this information has been presented in Sections 1.3 and 1.5.

Figure 2.1 is a site plan of OU4 that identifies the location of the Miami-Erie Canal, South Pond, Mound Plant Drainage Ditch, runoff hollow, and the overflow creek.

2.2. PROBLEM STATEMENT

For the purpose of developing a conceptual model, a problem statement has been prepared to define what problem is being addressed by this removal action. The problem statement identification and development is essential to focus the entire approach to the removal action. The problem for this removal action is the presence of plutonium-238 in the soil and sediment at concentrations exceeding 75 pCi/g in the Miami-Erie Canal bed and banks, the Mound Plant Drainage Ditch, the South Pond, runoff hollow and the overflow creek areas of OU4.

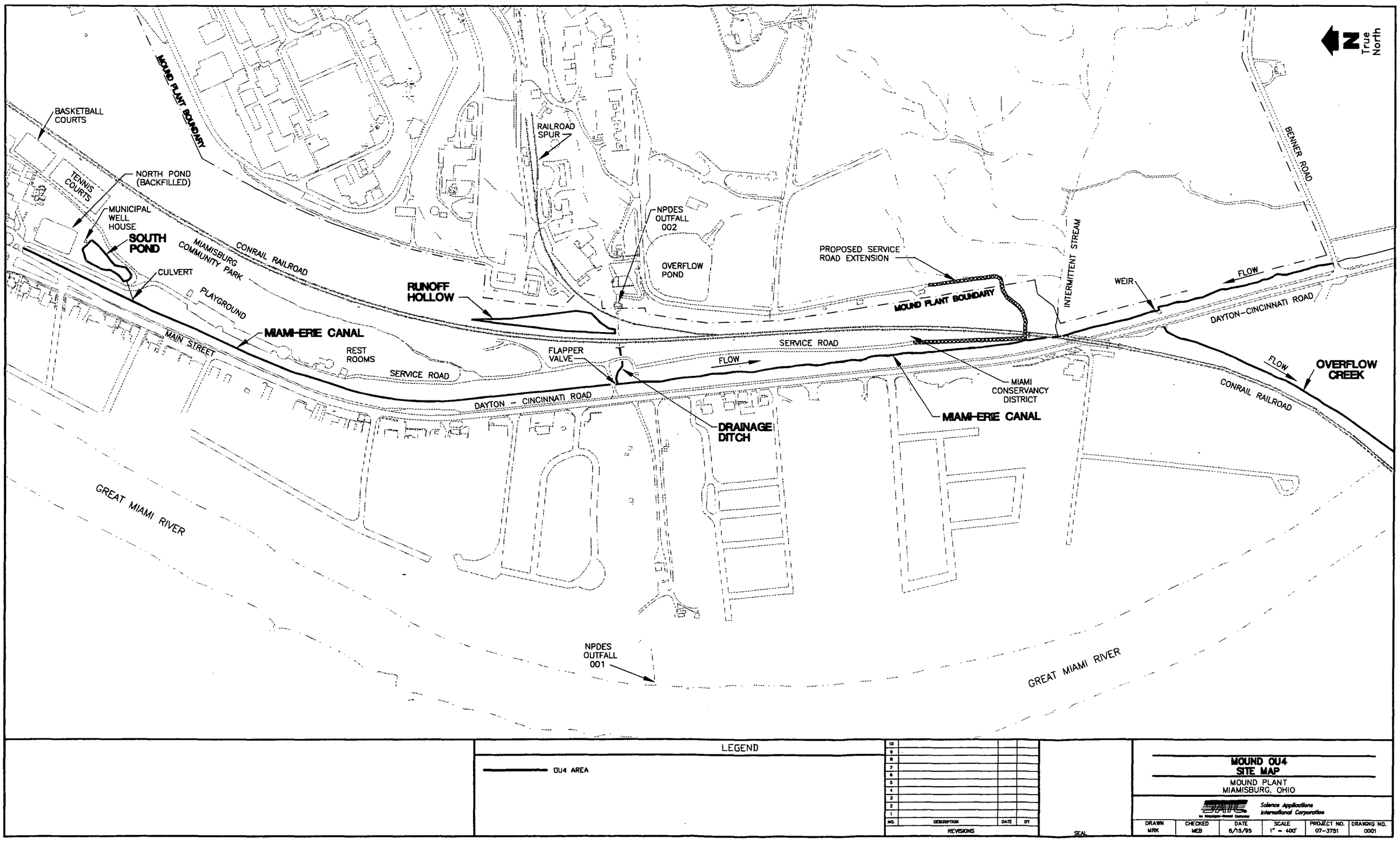


Figure 2.1. OU4 Site Map

2.3. EXPECTED CONDITIONS

Using the information from the various studies conducted at OU4 and recent information relative to the removal action, a conceptual model of the expected conditions was developed. The following sections provide a brief overview of the expected conditions identified for the removal action.

2.3.1. Site Features

The Canal has a number of physical features that will be monitored during the excavation. There is a sanitary sewer directly beneath the base of the North Canal with manholes extending above the surface. The depth of the sewer is expected to be well below the bottom of the proposed excavation. Buried utilities are also located along the Canal berm. These utilities should not impact the removal action. At the far south end of the North Canal, abandoned metal tanks (or geophysical anomalies) are suspected to be buried beneath the base of the Canal. The exact depth and characteristics of the tanks are unknown.

Surface water from the Mound Plant overflow pond National Pollutant Discharge Elimination System (NPDES) Outfall 002 is continuously discharged to the Mound Plant Drainage Ditch and conveyed to the South Canal. Mound plans to reroute the flows away from the South Canal, essentially removing all flows from the areas targeted for the removal action. It is expected that the Community Park will be closed to the public during this removal action.

2.3.2. Site Access

Currently, vehicle access to the Canal is limited to two locations. The principal access point is the Miamisburg Community Park. The other location is from Dayton-Cincinnati Road near the Mound Plant Drainage Ditch discharge point. OU4 encompasses property owned by the City of Miamisburg, Conrail, and the Miami Conservancy District. All required access agreements will be obtained before commencing the removal action.

2.3.3. Distribution of Contamination

Contamination at OU4 is limited to the soil and sediment. No significant surface water or groundwater contamination has been detected at the Canal. Contamination in the soil and sediment is distributed

uniformly along the Canal and associated waterways. Previous sampling efforts have not identified significant concentrations of hazardous chemical constituents. Radionuclides detected in OU4 include tritium, thorium-230, uranium-238, and plutonium-238 which is the primary contaminant of concern. The maximum concentration of plutonium-238 detected in the Canal soil is less than 4,560 pCi/g with an average concentration of 530 pCi/g (DOE 1994). Concentrations of plutonium-238 above 75 pCi/g have been detected in the North and South Canal and in the Drainage Ditch. The South Pond, overflow creek, and the runoff hollow all have maximum concentrations of plutonium-238 below 75 pCi/g.

2.3.4. Boundary Conditions

Based on the distribution of contamination, the boundary conditions for the removal action can be established. Available sampling information at OU4 indicates that the concentration of plutonium-238 above 75 pCi/g is confined to the soil and sediment from the surface to four feet deep in the Canal and Drainage Ditch except for a few locations. The data suggest that removal of the plutonium-238 contamination above the cleanup goal will also remove other radiological and non-radiological contamination. A contamination profile can be interpolated between known sampling locations to define the areas to be excavated. Accordingly, it is estimated that nearly 18,900yd^3 of material will have to be excavated (DOE 1995a).

2.4. UNCERTAINTY ANALYSIS

The purpose of the uncertainty analysis is to support the removal action by identifying what potential deviations from the expected approach may occur, the method for monitoring the deviation, and the contingency plan for responding to an unexpected condition. This procedure allows the removal action to proceed without a full characterization of the subsurface media. Included in the analysis is an evaluation of the likelihood of each potential deviation being encountered. Based on the likelihood of deviation occurrence, decision rules have been developed for including the potential deviation into the basis for design. Table II.1 presents the uncertainty analysis for the OU4 Removal Action.

Table II.1. OU4 Removal Action Uncertainty Analysis
Page 1 of 3

Expected Conditions	Potential Deviations	Monitoring	Contingency Plan	Evaluation
1. Except for a few locations, the contamination (Pu-238 > 75 pCi/g) is confined to the soil and sediment from zero to four feet deep in the bed portion of the canal.	Contamination is deeper than four feet in many locations. Contamination is along berm/outside canal bed.	FIDLER[1] can identify Pu-238 > 200-300 pCi/g.	Use FIDLER during excavation. Further screen selected samples to 25 pCi/g using Mound lab or customized field detector/analyzers.	Decision: Either adopt decision rule to pursue indications during removal or wait for results of verification sampling (post-removal).
1(a). Contamination profile can be interpolated between known sampling locations.	Actual contamination pattern is different than assumed.	FIDLER can identify Pu-238 > 200-300 pCi/g.	Perform random sampling to confirm expected condition. If condition is not confirmed, revise excavation plan.	Decision: Either adopt decision rule to pursue indications during removal or wait for results of verification sampling (post-removal).
2. There is no surface water or groundwater contamination.	Water is contaminated.	None.	Except for stormwater events, surface water should not be present at time of removal action, and groundwater will be addressed in OU9. Remove standing water after stormwater events.	To ensure that no surface water is present during removal action, include contingency for stormwater removal in excavation plan.
3. Soil and sediment contamination is distributed uniformly along the canal and associated waterways.	Hot spot contamination exists.	FIDLER can identify Pu-238 > 200-300 pCi/g.	Soil to be excavated per known contamination pattern, which does account for hot spots.	Provide for contingency in excavation plan to address hot spot removal.
4. Pu-238 concentration in canal is up to 4,560 pCi/g.	Higher (unknown level and location) concentration exists.	FIDLER can identify Pu-238 > 200-300 pCi/g.	Higher PPE protection levels may be required.	Provide for contingency in HSP.
5. H-3 concentration in canal is up to 110 nCi/g.	Higher concentration and/or dissimilar pattern to Pu-238.	None for H-3.	Use Mound lab or customized field detector/analyzers tuned for H-3.	No H-3 soil cleanup standard. Adjacent groundwater, H-3 contamination shown < SDWA criteria. Low probability. Wait for results of verification sampling.
6. Th-230 concentration in canal is up to 38 pCi/g.	Higher concentration and/or dissimilar pattern to Pu-238.	FIDLER can identify thorium isotopes > 10-25 pCi/g.	Further screen samples to 5 pCi/g using Mound lab or customized field detector/analyzers.	Include thorium 5/15 pCi/g cleanup standard as per DOE Order 5400.5.
7. Uranium concentration in canal is up to 39 pCi/g (U-238).	Higher concentration and/or dissimilar pattern to Pu-238.	None.	Use Mound lab or customized field detector/analyzers tuned for uranium isotopes.	No uranium soil cleanup standard. Low probability. Wait for results of verification sampling.

Table II.1. OU4 Removal Action Uncertainty Analysis
Page 2 of 3

Expected Conditions	Potential Deviations	Monitoring	Contingency Plan	Evaluation
8. Existing sanitary sewer line under N. canal (manhole "mounds") will not prevent removal activities.	Contaminated soil throughout region where pipeline is located.	Visual inspection during excavation.	Evaluate insitu condition vis-a-vis contamination level. Adopt more careful excavation approach if insufficient clearance is found.	Include contingency in excavation plan.
9. The buried utilities adjacent to the canal will not be adversely affected.	Sewer line in poor physical condition.	Visual inspection during excavation. Utility records.	Provide shoring during excavation in vicinity of utilities.	Include contingency in excavation plan.
10. Drainage ditch discharge pipeline construction project will not interfere or prevent removal activities.	Drainage project delayed or presents an obstacle to excavation.	Coordination with project managers.	Revise removal schedule or work location of either project. Delay start of removal pending completion of drainage pipeline project.	Include contingency in excavation plan.
11. Suspected tanks or metal anomalies buried in the N. canal will not be encountered during excavation.	Buried tanks encountered.	Results of previous Geophysical survey.	Use metal detectors during excavation.	Include contingency in excavation plan to remove buried tanks.
12. Drainage pipeline project will address offsite discharges, keeping canal dry.	Surface water from Mound overflow pond is continuously discharged into the S. Canal via NPDES Outfall 002.	Coordination with project managers.	Temporarily reroute flow in S. canal during removal. Delay start of removal pending completion of drainage pipeline project.	Include contingency in excavation plan to re-route flow in canal.
13. The Miamisburg community park will be available for use as a staging area.	Community park not available.	Coordinate land access agreement strategy.	Use site on Mound property.	Site staging area prior to excavation start.
14. Excavation will remove all Pu-238 concentrations above 150 pCi/g and concentrations above 75 pCi/g to a 95% confidence limit.	Results of excavation does not satisfy cleanup standard.	Verification sampling.	Excavate soil in known location where verification sampling indicates Pu-238 exceeds standard of 75 pCi/g.	Include contingency in excavation plan.
15. Insitu volume of excavated material will be about 18,900 yd^3.	Greater volume must be excavated. Insufficient containers/storage available to handle greater volume.	Monitor available storage and container supply.	Procure more containers. Arrange for more site storage. Increase shipping volume/schedule. Provide volume reduction.	Estimate is conservative. Include strategy in excavation plan to monitor available disposal/shipping capacity with actual production.

Table II.1. OU4 Removal Action Uncertainty Analysis
Page 3 of 3

Expected Conditions	Potential Deviations	Monitoring	Contingency Plan	Evaluation
16. No significant amounts of mixed wastes will be encountered.	Significant mixed waste encountered.	Results of waste characterization required for disposal approval.	Obtain authorization for mixed waste disposal.	Low probability. Identify disposal strategy in excavation plan.
17. Pu-238 exceeds 75 pCi/g in N. and S. canal and drainage ditch.	Actual concentration does not exceed cleanup standard.	Results of sampling studies indicate concentration exceeds cleanup standard in these locations. Results of insitu / Mound screening will confirm.	None. Less excavation required.	Existing strategy is conservative.
18. Pu-238 is less than 75 pCi/g in overflow creek, S. pond, and runoff hollow.	Actual concentration exceeds cleanup standard.	Results of sampling studies indicate concentration does not exceed cleanup standard in these locations.	Revise excavation plan to include contaminated areas, based on verification sampling results.	Low probability. Await verification sampling results.
19. Site access agreements will be obtained.	Site access agreements not obtained.	Coordinate land access agreement strategy.	Delay start of removal pending completion of access agreements. Work in areas where access is permitted.	Include contingency in excavation plan.
20. Clearing and grubbing is feasible.	Vegetation removal constrained by obstacles, insufficient operating clearance, interference with utilities, etc. Vegetation is contaminated.	Pre-excavation site survey.	Perform "customized" excavation to minimize clearing and grubbing requirements.	Include contingency in excavation plan.
21. Removal of all Pu-238 contaminated soil > cleanup standard "will take care of" all other contamination, rad and non-rad.	Non-Pu contamination pattern differs significantly from Pu-238 distribution.	None.	Evaluate results of verification sampling.	Low probability. Await verification sampling results.
22. The access road extension to Mound Plant under the conrail trestle will be completed for the Removal Action.	Access road will not be completed.	Coordination with Project Managers.	Use public access roads to transport soil to Mound staging area.	Establish transport coridor as part of project site controls.

1. FIDLER - Field Instrument for the Detection of Low Energy Radiation.

3. DESIGN BASIS

This section presents the design basis for the removal action considering the known and anticipated conditions at OU4 and the potential deviations (identified in Section 2) that are likely to occur during the removal action. These features have been used to develop the expected approach for implementing the removal action. Also, the ARARs which are part of the design basis and which are discussed in the EE/CA (DOE 1995a) have been summarized to identify the specific regulations, orders, and guidelines that will be applied to this removal action.

In addition to the expected approach, this section discusses other options still under consideration for completing the removal action. Options under consideration include the excavation, re-routing flows from the Canal, staging of excavated material, and waste management.

The design basis includes cleanup levels for the soil and sediment in OU4 that have been negotiated and selected, and the decision rules to be administered during the excavation to ensure that the objectives (Section 1.4) of the removal action are achieved. A flow diagram of the proposed progression of work has been included in this section to provide a visual representation of the steps involved in completing the removal action.

3.1. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The activities described for this removal action will be conducted in accordance with all ARARs to the extent practicable (40 CFR 300.415). The ARARs identified for the OU4 removal action have been complied from discussions among the DOE, USEPA, and OEPA (DOE 1993c, EPA 1993, OEPA 1993). From this compilation, the ARARs specific to the removal action alternative chosen for OU4 are listed in the following sections. The justification for including/excluding the ARARs as specified in the EE/CA (DOE 1995) is provided in Appendix E.

3.1.1. Chemical-Specific ARARs

Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies that establish concentrations or discharge limits for particular chemicals. The following chemical-specific ARARs have been identified for the OU4 removal action:

1) 40 CFR 61 Subpart H: National Emission Standards for Emissions of Radionuclides Other Than Radon from DOE Facilities;

2) 10 CFR 20: Standards for protection against radiation;

3) 10 CFR 61: Licensing requirements for land disposal of radioactive waste;

3.1.2. Location-Specific ARARs

Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in special locations. The following location-specific ARARs have been identified for the OU4 removal action:

1) 40 CFR 6, Appendix A: Executive Order 11988 (Floodplain Management) and 11990 (Protection of Wetlands);

2) Clean Water Act (CWA) 404: dredge and fill wetland; and

3) 16 United States Code (USC) 661: Fish and Wildlife Conservation Aact - requires action to protect fish and wildlife from actions modifying streams.

3.1.3. Action-Specific ARARs

Action-specific ARARs are usually technology- or activity-based requirements or limitations applied to specific actions. The following action-specific ARARs have been identified for the OU4 removal action:

1) 10 CFR 830.120: quality assurance requirements (DOE);
2) 33 CFR 320 thru 330: discharge of dredge and fill materials to waters of the U.S;
3) 40 CFR 230: discharge of dredge and fill materials to waters of the U.S.;
4) 40 CFR 264.13: waste analysis;
5) 40 CFR 264.171 thru 176: hazardous waste container management;
6) 40 CFR 264.228: surface impoundment closure requirements and post-closure care;
7) 40 CFR 264.251: waste piles;
8) 40 CFR 260-266: Hazardous waste management;
9) 40 CFR 268.1 through 268.9: land disposal restrictions - general;

10) 40 CFR 268.50: storage of banned waste (e.g., mixed waste);

11) RCRA §3004(e): dust suppression;

12) Ohio Administrative Code (OAC) 3745-15-01 through 3745-15-09 and 3745-49-01 through 3745-49-04: Requirements include measurement of emissions of air contaminants, scheduled maintenance, reporting, and malfunction of equipment;

13) OAC 3745-17-01 through 3745-17-11: Measurement of ambient air quality and allowable emission standards;

14) OAC 3745-22: Establishes criteria for the discharge of dredged or fill material to surface waters;

15) OAC 3745-27-01 through 3745-33-10: Requirements include authorized solid waste disposal methods, operational requirements for solid waste disposal facilities, and closure requirements;

16) Ohio Revised Code (ORC) 3767: Prohibits noxious exhalation or smells, obstruction or pollution of water courses, or other nuisances;

17) ORC 6111: Prohibits pollution of waters within the state;

18) Occupational Safety and Health Administration (OSHA) 29 CFR 1910: Requirements include general standards for worker protection;

19) Department of Transportation (DOT) 49 CFR 172, 173: Hazardous Materials Transportation and Hazardous Material Employee Training Requirements.

3.1.4. Requirements To Be Considered

Requirements to be considered (TBC) supplement ARARs. TBCs are used when no ARAR exists or where ARARs are not sufficiently protective of human health or the environment. The following TBC requirements have been identified for the OU4 removal action:

1) 40 CFR 300: National Contingency Plan Superfund Hazardous Substance Response;

2) DOE Order 5400.5: Radiation Protection of the Public and the Environment;

3) EPA/230/02-89/042: Methods for Evaluating the Attainment of Cleanup Standards;

4) RCRA: Guidance for Implementing RCRA Regulations; and,

5) Office of Solid Waste and Emergency Response (OSWER) 9355.0-25A: Use of Removal Approaches to Speed Up Remedial Actions Projects.

3.2. CLEANUP GOAL

For the OU4 Removal Action, a plutonium cleanup goal was developed by DOE as the lead agency, with input and concurrence from the Stakeholders through the OU4 Focus Group and Mound Action Committee (DOE 1995b). The plutonium-238 cleanup goal includes development of a field excavation plan to remove areas of soil and sediments in the Canal known to have plutonium contamination levels greater than 75 pCi/g, which is achievable with state-of-the-art field sampling and analysis techniques. Plutonium concentrations less than 75 pCi/g will not require excavation from the Canal. The field excavation will further remove all soils and sediments having plutonium contamination down to 25 pCi/g (ALARA) in the vicinity of areas that now exceed 75 pCi/g. Table III.1 summarizes the plutonium cleanup goal for the OU4 Removal Action.

Table III.1. OU4 Removal Action Plutonium-238 Cleanup Goal

As Low As Reasonably Achievable (ALARA)	25 pCi/g
95% Confidence Limit	75 pCi/g
Maximum Residual	150 pCi/g

3.2.1. Decision Rules

To achieve the required cleanup goal, the following decision rules should be applied:

a. If the soil contamination is greater than 75 pCi/g of plutonium-238, develop an excavation plan to remove all soil whose plutonium-238 concentration exceeds 25 pCi/g; and

b. Initiate excavation in a location of known plutonium-238 contamination above 75 pCi/g and remove soil and sediment above the plutonium-238 cleanup goal.

3.3. EXPECTED APPROACH

The tasks and conditions that make-up the expected approach for the removal action have been categorized below under site preparation, excavation, waste management, and site restoration to correspond to the proposed sequence of work. Figure 3.1 is a flow diagram presenting an overview of the expected approach for the sequence of work.

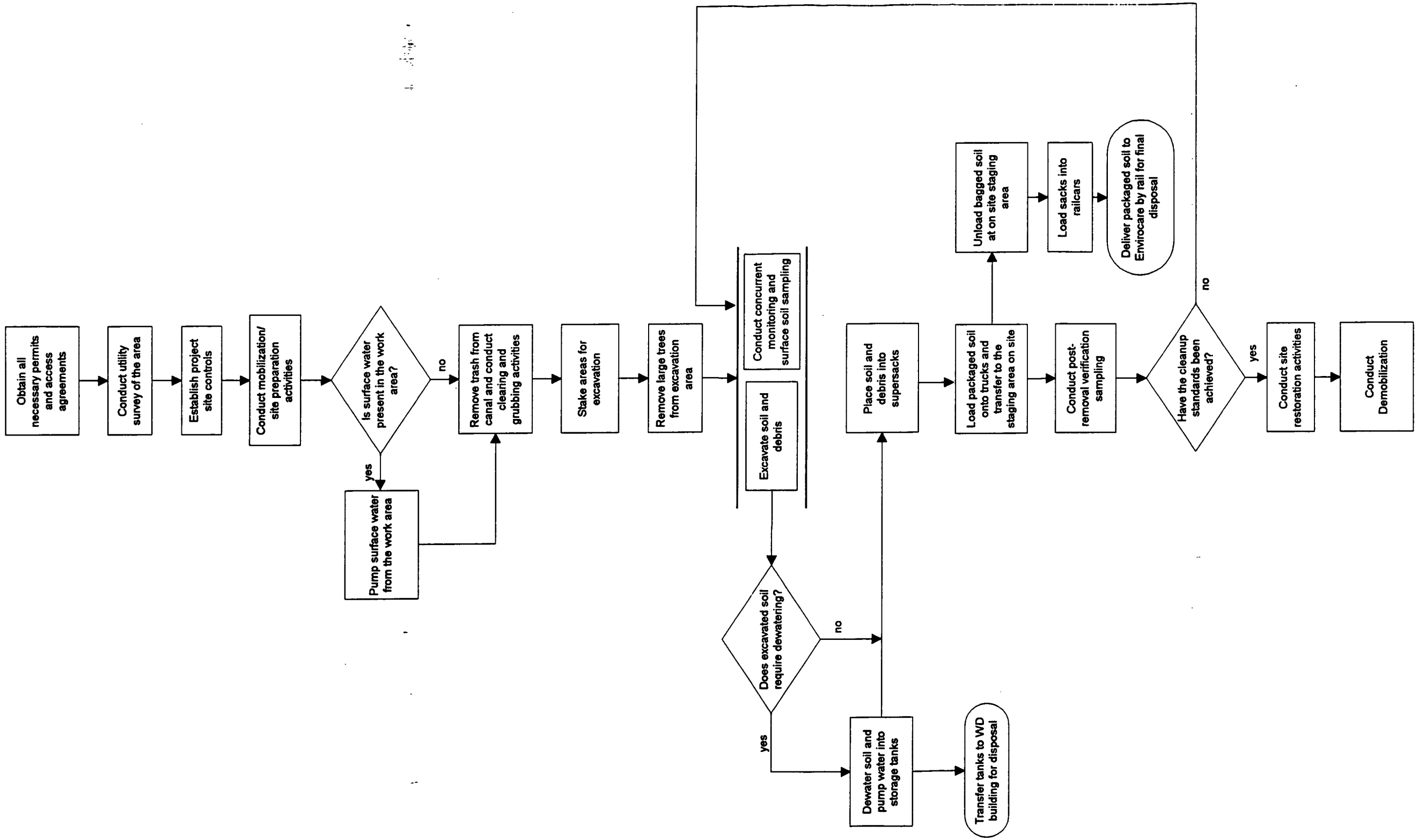


Figure 3.1. Flow Diagram of Expected Approach

3.3.1. Site Preparation

The site preparation includes all activities that must be completed or in place before initiation of soil excavation. These tasks include:

a. Obtaining all permits and access agreements;

b. Completing surveys of underground utilities;

c. Installing site controls;

d. Establishing site facilities including temporary utilities as necessary for construction facilities;

e. Mobilizing supplies, equipment, and personnel to the site;

f. Establishing work zones and staging areas;

g. Identifying areas for clearing and grubbing; and,

h. Diverting Mound Site drainage from the Drainage Ditch and Canal.

i. Access Road Extension

j. Rail Spur Upgrade.

DOE will secure all access agreements and obtain all required permits prior to the start of the removal action. The excavation task may be revised if there are delays in obtaining certain access agreements. A field survey will be conducted to stake areas for excavation, confirm the location of above ground and underground utilities, and identify areas for clearing and grubbing. This will include marking trees near the excavation that are not to be removed.

Site controls will be implemented as part of the site preparation activities. Site controls may include fences, access gates, and community or security guards around the OU4 boundary (DOE 1995b).

It is expected that the Community Park area will be available for use as the main site access, a community relations center, project office area and/or possible staging area. Work zones, decontamination areas, and possible construction trailer sites will be established. Temporary utilities including power and potable water will be made available as necessary.

A number of unresolved issues or options may influence the site preparation activities. Plans are in place for rerouting the Mound Plant Drainage Ditch around the South Canal to eliminate Mound Plant discharges to the South Canal. If this project is delayed or not completed in time for the removal action, site preparation may include installation of a temporary dewatering system to keep the Canal dry.

Mound is investigating the option of locating the staging area and construction trailers on Mound property. The service road along the east side of the Canal would be extended south and pass under the railroad trestle to access Mound Plant property. A culvert would have to be designed and constructed over the Canal at the trestle for vehicles to have a sufficient turning radius.

Conducting the removal action in phases to limit the amount of site controls required at one time is another option under consideration. This option could reduce the area of soil to be disturbed and exposed during excavation. One potential phase could include the excavation of contaminated soil in the area in the South Canal for construction of the culvert at the railroad trestle.

The expected approach includes following all applicable Mound site procedures since the waste management activity will be conducted on Mound Plant property.

3.3.2. Excavation

The excavation approach for the removal action will consist of four steps. The first step is to remove the surface debris from the Canal. The second step involves the clearing and grubbing of brush and small trees. The third step will be the clearing of larger trees that would interfere with the excavation. The final step will be the removal of contaminated soil, sediment, roots, and subsurface debris within the limits delineated on the detailed drawings.

Surface debris, brush, and trees will be removed from the excavation area and loaded into trucks for transportation and disposal as solid waste. Figure 3.2 shows the general area that will require the majority of the clearing and grubbing. Representative samples will be collected to confirm that the material to be cleared and grubbed is not contaminated. The excavation design will include procedures for handling and disposal of above ground vegetation that may be contaminated.

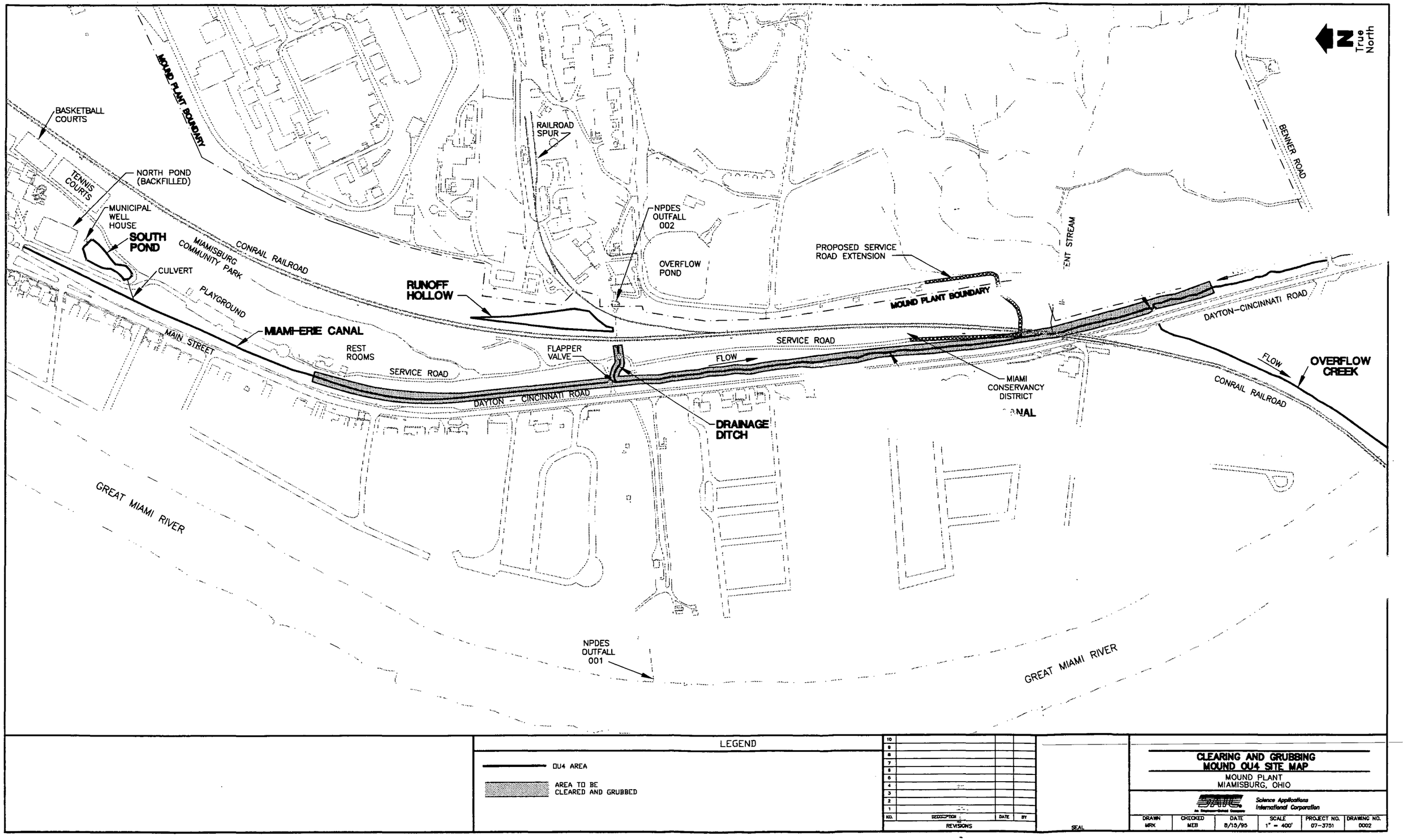


Figure 3.2. Clearing and Grubbing Site Map

The excavation task will progress from the north end of the Canal southward past the overflow creek. Sod, roots, sediment, soil, and subsurface debris will be excavated and transported to the staging area. Prior to excavation, the surface soil will be monitored with a Field Instrument for the Detection of Low Energy Radiation (FIDLER). Once the excavation reaches the boundary limits, the excavation will again be monitored with a FIDLER and soil samples will be collected and sent to the Mound screening facility. If the results of the sampling provide an indication that the cleanup levels have been achieved, the removal action will move to the next excavation point. If the results suggest that the cleanup levels have not been attained, the excavation plan will include procedures for additional excavation. Figure 3.3 shows the approximate area to be excavated. This area encompasses all locations of known plutonium-238 contamination above 75 pCi/g. The design includes excavating the soil to a depth that attempts to remove as much of the plutonium-238 concentrations above 25 pCi/g as possible.

The excavation design and the HSP will contain procedures for handling contaminated soil where the concentrations of the contaminants are higher than expected. Contingency plans will be included in the excavation design to remove and dispose of stormwater that comes into contact with the contaminated soil and to remove stormwater from the Canal prior to excavation.

The excavation design will also include contingency plans for responding to subsurface features that have a potential for impacting the removal action. These plans include:

a. Special excavation techniques to remove contaminated soil around the sanitary sewer system or other utilities;

b. Options for providing shoring to support utilities adjacent to the excavation; and,

c. Procedures for removing abandoned tanks and other geophysical anomalies.

3.3.3. Waste Management

The waste management task includes the handling and disposal of the waste material generated during the removal action. The expected approach requires the handling and disposal of:

a. Debris (trash) collected from the Canal;

b. Brush and trees;

c. Soil, sediment, and roots;

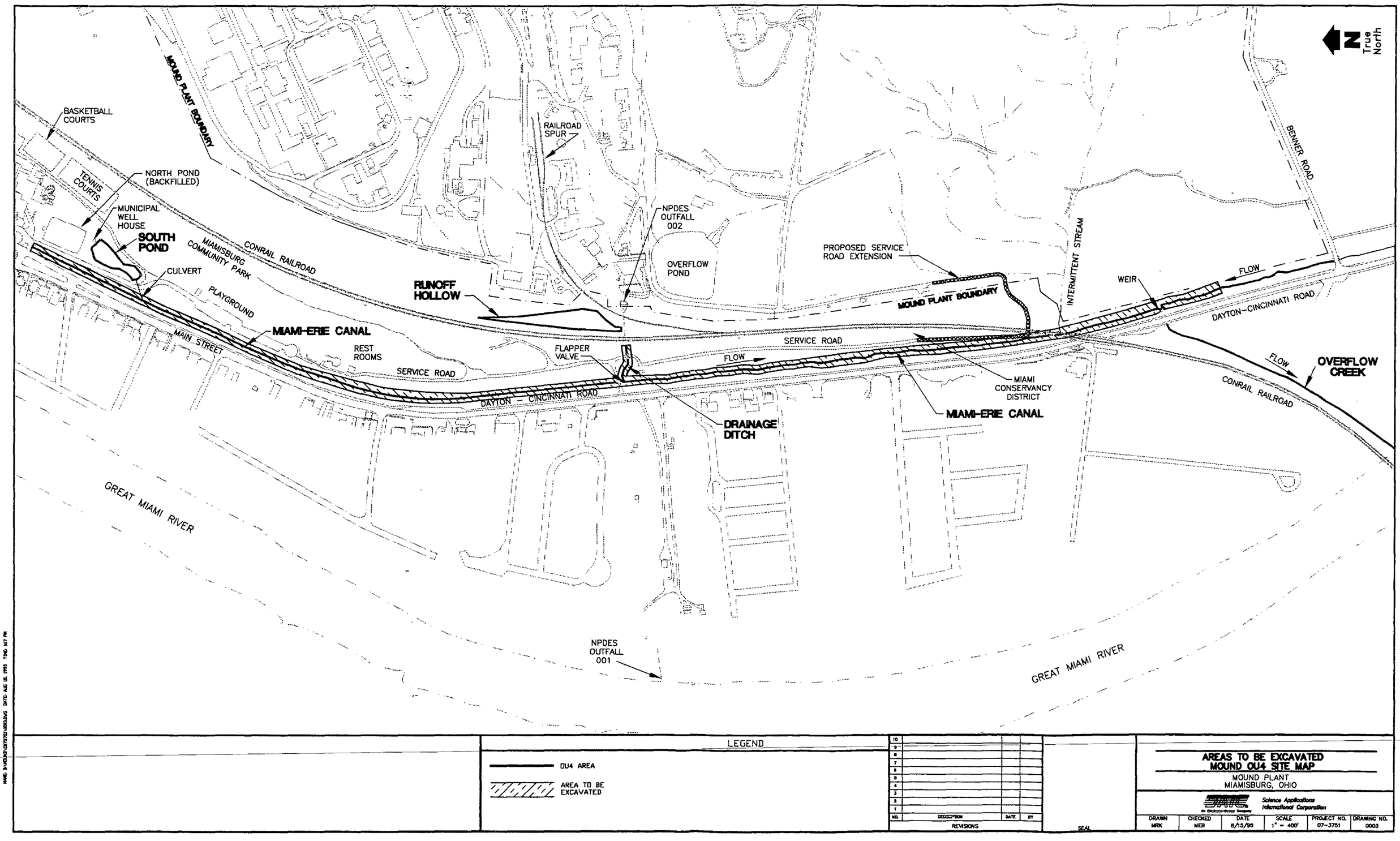


Figure 3.3. Excavation Site Map

d. Subsurface debris;

e. Contaminated surface water; and

f. Excavation equipment decontamination rinsate.

Debris collected from the waterways and the brush and trees removed during the clearing and grubbing will be managed as solid waste. A wood chipper may be brought onsite to reduce the larger trees that are marked for removal.

Excavated soil, sediment, roots, and subsurface debris will be packaged in specially-designed bags and transported to the onsite staging area. From there the bags will be loaded onto transport vehicles for disposal at an approved disposal facility. This approach assumes that the service road will be extended under the train trestle for controlled access to the Mound property. The rail spur to the Mound property will have to be upgraded before it can be used for transporting waste material offsite.

Surface water that collects in the Canal during the removal action may have the potential to come into contact with contaminated soil. This water will be collected and pumped, or removed by other means, to plastic storage tanks and transferred to the Mound Plant WD Building for treatment and disposal.

Excavation equipment and containers exposed or potentially exposed to contaminated material will be decontaminated. All decontamination rinsate stored in plastic tanks will be transferred to the Mound Plant WD Building for treatment and disposal.

The waste management approach will include contingency plans to respond to deviations from the expected conditions that are likely to occur. These contingency plans include:

a. Alternatives for handling, staging, and disposal of the excavated material;

b. Removal of a larger volume of contaminated material than projected;

c. Disposal of tanks or vaults discovered during the excavation; and,

d. Options for dewatering contaminated soil.

Appendix A contains a copy of the DOE memorandum providing exemption for use of commercial radioactive waste disposal facilities for low-level waste. One option being considered for handling

excavated soil is loading the material into vehicles for transportation to the Mound Plant staging area. The bulk material can either be loaded into rail cars for transportation to Envirocare, or shipped by truck to an approved disposal facility. Another option is to transport the excavated material to the Mound Plant staging area where it would be packaged in supersacks. The supersacks would then be loaded into rail cars and delivered to Envirocare for disposal.

Procedures will be included in the waste management plan for disposal of a larger volume of material than projected. The specific procedures will depend on the selected handling and disposal option. The waste management plan will also include procedures for handling and managing any excavated tanks or geophysical anomalies to conform with the waste acceptance criteria of the disposal facility.

If the excavated soil is saturated, it may have to be dewatered to comply with the waste acceptance criteria of the disposal facility. Soil may be dewatered at the excavation or at the staging site. Water drained from the soil will be collected, sampled, and sent to the WD Building, if appropriate.

3.3.4. Site Restoration

The project site will be restored once the excavation is complete, and sampling (in accordance with the procedures presented in Sections 5 and 6) confirms the cleanup standards have been achieved. The goal is to restore the site to a condition acceptable to the Stakeholders for future land use options.

In the North and South Canal areas, clean fill with low permeability will be brought in from off-site and placed in the excavation. The material will be compacted along the base and sides of the Canal. A layer of top soil will be placed over the compacted material and hydroseeded. Best management practices will be used to prevent erosion.

Restoration of the Drainage Ditch will conform to the detailed plans for rerouting the flow from the ditch and Canal.

4. REMOVAL ACTION ACTIVITIES

This section describes the specific activities required for implementation of the removal action. These activities are based on the excavated soil being loaded into supersacks and transferred to a staging area located near the Mound rail spur. The supersacks will be loaded into rail cars and shipped to an approved disposal facility.

4.1. PROJECT SITE CONTROLS

The following sections outline activities that must be completed to establish the project site controls.

4.1.1. Permits

a. Initiate and approve all permits such as Radiation Work Permit (RWP), excavation/digging permit, and penetration permit prior to implementing site control field activities.

b. Secure all access agreements from property owners before installing site controls on their property.

c. Secure formal disposal agreement between Mound/DOE and the approved disposal facility for the OU4 removal action project.

4.1.2. Health and Safety Requirements

a. Verify that all field personnel have received radiological and hazardous training before initiating field activities. Field personnel must have completed the following training programs:

1. General Employee Training;

2. OSHA 40-Hour Hazardous Waste Operations and Emergency Response Training; and,

3. Radiation Worker II Training.

4.1.3. Site Surveys

a. Survey and stake all property lines prior to the installation of site controls between property lines.

b. Notify utility companies before initiating any digging activities.

c. Identify all items requiring lockout/tagout.

4.1.4. Access Controls

a. Install site controls including fencing and warning signs, in accordance with the detailed drawings and Mound procedures.

b. Install chain link fencing and gates, separating the project area from the general public, and warning signs before initiating construction of other site controls.

c. Install radiation barrier rope and warning signs to separate Soil Contamination Areas (SCAs) from general work areas within the Mound Health Physics Control Areas. (Note: Established SCAs will encompass each soil excavation location). Establish a control point at the entrance of each SCA.

d. Coordinate site control activities with the OU4 Stakeholders to provide reassurance of the site safety practices.

4.2. SITE PREPARATION

The following activities must be performed to prepare the site for execution of the planned removal action.

4.2.1. Health and Safety Requirements

a. Follow all training and qualification requirements of the HSP. Document conformance by signing the acknowledgment form.

b. Use safety equipment as specified in the HSP to ensure compliance with regulations and to ensure worker safety.

c. Provide necessary shoring during excavation activities to ensure that excavation sidewall integrity is maintained.

d. Ensure all equipment on site conforms to Mound safety standards and is available for inspection by Mound Safety Personnel.

e. Use direct reading air monitoring and radiation instruments as specified in the RWP or other applicable documents, as determined by Mound Health Physics.

f. Prepare water supply for fugitive dust emission control.

4.2.2. Survey for Utility Lines

a. Survey Canal area to determine location of overhead, surface, and subsurface utilities. Current information indicates the following utilities exist in the Canal vicinity:

1. Subsurface sanitary sewer line (North Canal);
2. Utility poles;
3. NPDES Outfall 001 conduit; and
4. Underground electrical and/or telephone lines.

b. Remove utilities from service temporarily, as required, in accordance with Mound lockout/tagout procedures.

4.2.3. Clearing and Grubbing Requirements

a. Survey the Canal area to determine the requirements for removal of vegetation (see Figure 3.2).

b. Procure additional clearing equipment if survey shows such equipment will be necessary to remove vegetation.

4.2.4. Construction Facilities

a. Locate the construction facilities (i.e., existing buildings or trailers) such that they are convenient to the work site and minimize interference with activities on public property.

b. Provide electrical, potable water and telephone services (as necessary) to the construction facilities.

c. Provide trash collection and restroom facilities (as necessary) adjacent to the construction facilities.

4.2.5. Decontamination Area

a. Locate a decontamination area within the control zone, as determined by the Site Health and Safety Manager.

b. Construct decontamination facility, consisting of a vehicle wheel-wash system and water collection system.

c. Obtain at least two 1200-gallon plastic storage containers for collection of potentially contaminated rinsate.

d. Decontaminate personnel, construction equipment, and general equipment as required during the course of the removal action in accordance with Environmental Restoration (ER) Program Standard Operating Procedure (SOP) 1.6. and 1.8 and the Work Plan HSP.

4.2.6. Staging Area

a. Locate an area near the site of excavation activities to support staging of excavated waste.

b. Construct a waste staging facility with the following components:

1. Access to the waste staging facility for vehicles arriving onsite to receive packaged waste soil and debris.

2. A temporary waste staging pad where the packaged soil and debris can be safely stored prior to being loaded onto the transport vehicles.

4.2.7. Site Drainage

a. If the site drainage reroute project has not been completed, take steps to temporarily divert flows from the Drainage Ditch and South Canal to another outfall which feeds the Great Miami River.

4.2.8. Access Road

a. If the Access Road extension project has not been completed, take steps to obtain DOT permits for transport of waste soil packages over public roads to the Mound Plant staging area.

4.2.9. Rail Spur

a. Upgrade the existing Mound Plant rail spur to permit shipment of packaged waste soil via railcar to an approved disposal facility.

4.3. MOBILIZATION

The following resources will be mobilized in preparation for this removal action.

4.3.1. Personnel

a. Certify that all field personnel have received all required training.

b. Obtain acknowledgment that field personnel have received and read the HSP.

c. Make available, as needed, all support personnel including Health Physics and Industrial Hygiene.

4.3.2. Equipment

a. Procure and make available all necessary excavation equipment, such as trackhoes, backhoes, loaders, bulldozers, hand tools, dump trucks, tanker trucks, fork lifts, cranes, and generators, as required.

4.3.3. Instrumentation

a. Procure, calibrate, and make available all necessary instrumentation required by the RWP and the HSP.

4.3.4. Soil Packaging Supersacks

a. Procure a sufficient number of supersacks for packaging waste soil and debris, and store at the OU4 onsite staging area.

4.3.5. Storage Containers

a. Procure and make available at the excavation site at least two 1200-gallon plastic storage containers for collection of potentially contaminated water.

b. Procure and make available at the decontamination area on site at least two 1200-gallon plastic storage containers for collection of potentially contaminated runoff from the staged waste pile and decontamination liquids.

4.3.6. Utilities

a. Procure and make available all necessary utilities, such as electrical power, and potable water.

4.3.7. Personal Protective Equipment (PPE)

a. Procure and make available all necessary PPE as specified by the RWP and HSP.

b. Ensure all PPE is in proper working order.

4.4. EXCAVATION OF CONTAMINATED SOIL

As described in Section 3.3.2, the excavation of the contaminated soils and sediments in OU4 will proceed using a phased approach (see Figure 3.1) . The approach will include selecting an area for the next stage of removal; clearing all surface debris, brush, small trees, and selected large trees; marking areas to be excavated; excavating designated soils, sediments, roots, and associated subsurface debris; and transferring materials to disposal bags. This approach will continue until all areas designated for this removal action have been addressed (refer to excavation plans shown in Figures 3.2 and 3.3). The following sections describe the required steps to accomplish the excavation, along with selected contingencies. The reader will be referred to detailed plans (i.e., health and safety, quality assurance, and sampling plans) for information about associated activities required to be performed during this removal action.

If standing surface water is encountered prior to excavation, the following contingency plan will be implemented:

a. Use pumps to remove standing water.

b. Sample and analyze water for contamination prior to disposal.

c. Transfer water to a tanker truck.

d. As necessary, empty contents of the tanker truck into a retention pond at Mound Plant.

Note: Standing surface water in the Canal will not be considered contaminated if it has not come into contact with a potentially contaminated (i.e., excavated) surface. If the water is contaminated, it will be transferred to a plastic storage tank in accordance with Section 4.5.4 (Potentially Contaminated Water).

Note: Plant surface water discharge flowing through the South Canal must be either permanently or temporarily rerouted in order for the removal to proceed. It is not intended that the contingency plan above should be used to remove continuous flowing surface water from the Canal. A discussion of the site drainage reroute project is presented in Section 9.

4.4.1. Debris Removal

a. Within an area designated by the Removal Site Supervisor, remove all debris from the ground surface and place in solid waste bags.

Note: Debris is defined as all removable, non-vegetation trash, such as man-made paper products, food containers, building materials, rocks, animal carcasses, and similar non-indigenous materials.

Note: Debris can be placed in conventional plastic bags (i.e., bags are not required to be those designated for contaminated materials).

b. Dispose of debris as per Section 4.5.2. (Vegetation).

4.4.2. Clearing and Grubbing

a. Collect random samples (Section 6) to determine if any vegetation is contaminated.

b. Using equipment and materials at hand, clear and grub all vegetation from the ground surface (see Figure 3.2) and place in solid waste bags.

Note: Vegetation is defined as attached flora, including tall grasses, brush, bushes, small trees, and other native plants.

Note: Uncontaminated vegetation can be placed in conventional plastic bags (i.e., bags are not required to be those designated for contaminated materials). Place any contaminated vegetation in disposal bags.

c. Dispose of uncontaminated vegetation as per Section 4.5.2. (Vegetation).

4.4.3. Tree Removal

a. Stake area designated for excavation.

Note: Locations of surface features and buried structures to be preserved unharmed during the removal, such as utilities, city monuments, and warning signs, shall be marked for protection. Barriers shall be erected as necessary to prevent damage to protected features during the removal action.

b. Within the area selected for excavation, the Field Construction Manager shall select trees to be removed prior to performing excavation activities.

c. Using equipment and materials at hand, cut the selected trees to within one foot of ground level.

Note: Trees may require size reduction before disposal. Trees can be placed in conventional plastic bags (i.e., bags are not required to be those designated for contaminated materials). Tree stumps will be handled in accordance with Section 4.4.4.

d. Dispose of uncontaminated trees as per Section 4.5.2. (Vegetation).

4.4.4. Contamination Removal

This section describes the procedures for excavating contaminated soil, sediment, stumps, and roots within areas selected for removal (see Figure 3.3).

a. Perform removal monitoring and sampling at the onset of, and as required during, the excavation activities, in accordance with Section 5.1 (Removal Action Sampling) and the site-specific HSP.

b. Excavate the selected surface to the required elevation, in accordance with the excavation design drawings, using a trackhoe excavator or equivalent earthmoving equipment.

Note: A water mist may be sprayed on all freshly exposed soil and sediments as necessary to eliminate dust based on the Field Construction Manager and the Health Physics Technician's determination.

c. Place the excavated soil and sediments into disposal bags (supersacks) for transfer away from the OU4 area in accordance with Section 4.5.1.2. (Soil Handling and Disposal).

Note: All soils designated for excavation shall be treated as if they are contaminated. Manage any subsurface debris encountered in accordance with Section 4.5.3. (Underground Debris). The Field Construction Manager shall be notified when any unknown debris or unexpected utilities are uncovered by the excavation equipment.

Note: Unknown debris shall be identified either visually or by sampling. Evaluate PPE requirements and provide notification to the waste disposal site, if required.

Note: Examine unexpected utilities uncovered by the excavation equipment to determine who owns the utility; if the utility is active or inactive; and if the utility can be rerouted, removed, or taken temporarily out of service.

d. Remove saturated contaminated soils with a "clamshell" crane or similar device to a designated dewatering area prior to placing soils into disposal bags.

Note: Use sump pumps of adequate capacity as necessary to remove small volumes of standing water which may be present in the area chosen for excavation. Transfer water to a plastic storage tank at the site, in accordance with Section 4.5.4. (Potentially Contaminated Water).

e. When the excavation "front" has progressed sufficiently, and before any planned work stoppages, cover the exposed surface with liners to minimize airborne transport effects.

Note: Repeat steps in Section 4.4.4 if the results of verification sampling (Section 5.2) indicate that additional hot spots require excavation.

f. Continue with the excavation procedures in this section for each area designated for removal.

4.5. WASTE MANAGEMENT

This section details the procedures to be followed for waste handling, staging, and disposal of waste generated during excavation as well as other activities associated with the removal action. These wastes include excavated soil, vegetation from clearing and grubbing activities, contaminated underground debris, rinsate from the decontamination facility, PPE, and water collected from the canal or from dewatering of excavated soil.

4.5.1. Excavated Soil

This section describes two phases of waste management related to handling excavated soil. The first is pre-excavation planning which includes all negotiations with the waste disposal facility and the required pre-shipment sampling. The second is the handling and disposal procedures for the contaminated soil after excavation.

4.5.1.1. Pre-Excavation Planning

Note: Mound has been granted an exemption from DOE Order 5820.2A which allows waste generated from OU4 to be disposed of at a commercial disposal facility (i.e., Envirocare). This exemption dated April 12, 1995 is included in Appendix A.

a. Ensure conditions specified in Exemption are met.

b. Collect representative samples of the canal waste soil for analysis at Envirocare's certified laboratory.

Note: Envirocare has established activity limits for each isotope they are permitted to receive. The limits applicable to this removal action are as follows:

- Plutonium-238 10,000 pCi/g
- Plutonium-238 8,200 pCi/g, if daughters present in equilibrium
- Thorium-230 15,000 pCi/g
- Uranium-238 28,000 pCi/g
- Tritium 20,000,000 pCi/g

The tests conducted will include the following:

- Gamma spectroscopy (natural and man-made isotopes);
- Uranium and Thorium isotopic analysis;
- Toxicity Characteristics Leaching Procedure (TCLP) (8 metals / 32 organics) plus copper and zinc;
- Hydrogen sulfide;
- Hydrogen cyanide;
- Soil pH and paint filter liquids test;

· Standard proctor test (ASTM D-698); and,

· Totals (if needed for metals and organics).

c. Complete Envirocare waste profile forms based on the analytical results provided to Mound by the Utah certified laboratory.

d. Submit lab analysis, profile forms, transport summary, and additional samples to Envirocare.

Note: The additional samples required consist of a minimum of five two-pound diverse, representative samples per waste stream. The result of these "fingerprint samples" will be used by Envirocare to establish acceptance criteria for all future waste shipments coming from the Miami-Erie Canal. It is important that these fingerprint samples represent all foreseeable waste constituents and at the maximum foreseeable concentrations, if practicable. If the contents of a waste shipment deviate significantly from the acceptance criteria, future waste shipments could be delayed.

4.5.1.2. Soil Handling and Disposal

a. Locate an area on the Mound Plant site near the existing rail spur for construction of the waste staging area.

b. Construct a waste staging facility with the following components:

1. Access to the waste staging facility for trucks arriving from the Canal and containing packaged waste soil and debris.

2. A waste staging pad where the packaged soil and debris can be securely stored prior to loading into the railcar.

3. A conveyance system for transferring the packaged waste from the waste staging pad into the rail cars. This system may be a conveyer-belt-type system or a small crane assembly.

c. Construct a staging area that can be moved with the progress of the excavation for loading soil into supersacks.

d. Transport packaged waste from the excavation to the onsite staging area.

Note: Vehicles will travel to the staging area on a newly constructed access road.

e. Unload the vehicles onto the waste handling pad located at the onsite waste staging facility.

f. Convey the packaged soil and debris into a rail car located on the nearby rail spur.

g. Comply with all rail transportation requirements by submitting the proper documentation.

Note: It has been estimated that a total of approximately 312 rail cars will be necessary to transport the waste soil generated by this removal action.

4.5.2. Trash and Vegetation

a. Dispose of trash in a bulk receptacle, leased from a licensed trash hauler.

b. Dispose of uncontaminated vegetation at the Mound construction spoils area.

c. Chip and store some vegetation, such as large trees, for future use on site.

4.5.3. Underground Debris

Note: Underground debris refers to any material encountered below the surface that is not soil, such as roots, large rocks, abandoned construction materials, etc.

a. Manage underground debris encountered in soils known to be contaminated as contaminated.

b. Combine such debris directly with the excavated low-level waste soil as long as the following conditions have been met:

1. The presence of the debris will not result in a violation of the waste acceptance criteria established by Envirocare. Small deviations may be accepted, but shipment of a large quantity of unanticipated debris may have to be negotiated with Envirocare.

2. The amount of debris present in the waste soil shipments does not exceed 10% of the total volume. This calculation is based on the total waste shipped over the entire removal action.

3. No debris may exceed the size limitations established by Envirocare. This limitation requires that one dimension be less than 10 inches. The other two dimensions must be less than 8 feet. Debris larger than this must be cut into smaller pieces to be disposed of at Envirocare.

4.5.4. Potentially Contaminated Water

Note: Potentially contaminated water includes (1) surface water that has come into contact with the open excavations of the Canal, (2) water generated during dewatering of excavated soil, and (3) rinsate generated from the decontamination facility.

a. Store water generated from the three sources described above in plastic tanks.

b. Sample the water in the tanks to determine if it can be treated and disposed at the Mound Plant WD Building.

c. Transfer the contents of the storage tanks to the WD Building via tanker truck.
Note: Water will be disposed of at this facility if sampling indicates contaminants do not exceed the WD Building acceptance criteria.

d. Transfer the tanks to Mound Plant, as directed by the Field Construction Manager, for storage pending alternate disposal if the water cannot be disposed of at the WD Building.

4.6. SITE RESTORATION

This section describes the site restoration procedures to be followed once the excavation activities are completed. Site restoration includes backfilling the Canal and Drainage Ditch with a layer of low-permeability material (such as clay), placing top soil over the low-permeability material, seeding and planting in accordance with the detailed landscape plans, and demobilization. Each of these tasks is described below.

4.6.1. Low-Permeability Backfill

a. Procure low-permeability clay backfill from off-site and place within the excavated areas to depths as indicated on design drawings.

Note: Before backfilling, verify that the excavated area is not porous, frozen, or spongy.

Note: If the backfill material is procured from Mound pre-approved clean fill vendors, no additional sampling/analysis will be required to verify that no hazardous materials are present.

Note: The minimum thickness of the backfill material will be as specified on the detailed drawings.

b. Construct the low-permeability layer in nominal six inch lifts that have a permeability of 1×10^{-6} centimeters per second or less.

c. Verify that the low permeability backfill is visually free of rocks, with a nominal size of one inch, and free of organic matter and other debris. The soil will not have irreducible clods greater than three inches, which may affect the permeability of the soil.

4.6.2. Top Soil

a. Procure a layer of top soil from off-site and place on the low-permeability backfill. The top soil layer will conform with the thickness and final contours shown on the detailed design drawings.

Note: The top soil layer will have a minimum thickness to support vegetation. The soil will be inorganic or organic, fine-grained, and conform to the soil classifications required by the detailed plans and specifications.

b. Construct soil layers to achieve nominal six inch compacted lifts.

4.6.3. Seeding and Planting

a. Apply fertilizer and agricultural lime once the final lift of the top soil layer has been graded.

b. Hydroseed all areas to be restored as grass areas.

Note: Seeding operations will be performed as many times as necessary in order to ensure a complete and dense vegetative cover.

c. Follow best management practices to prevent erosion from hydroseeded areas until grass is established.

d. Perform routine inspections of the seeded areas and erosion control systems. Perform all necessary repairs to the erosion control systems and seeded areas.

e. Install all trees, shrubs, and plants in accordance will the final landscape plans.

4.6.4. Demobilization

a. Decontaminate all equipment and materials.

b. Return all utilities temporarily removed from service to operation in accordance with Mound Lockout/Tagout procedures.

c. Collect and dispose of all temporary fencing and warning signs at the direction of the Removal Site Supervisor.

d. Remove all temporary utilities from service.

e. Remove all field trailers from the project site.

f. Complete demobilization activities at the direction of the Removal Site Supervisor so as to minimize disruption to local traffic.

5. SAMPLING

Two types of sampling will be performed for this removal action: 1) during the removal, and 2) after the removal. No additional pre-removal sampling is required. Waste characterization sampling of excavated material is described in Work Plan Section 4.5.1.

5.1. REMOVAL ACTION SAMPLING

After each section of OU4 is cleared, grubbed, and staked for excavation, an initial field survey for plutonium will be performed with a FIDLER on the surface before excavation commences. The objective of this sampling phase is to confirm whether hot spots (equivalent to > 300 pCi/g) exist, and to confirm that the selected level of protective equipment chosen for field personnel will be appropriate.

After excavation, the exposed surface will be surveyed (FIDLER) to identify any remaining hot spots. Surface soil samples (less than 6 inches deep) will be taken and screened for plutonium and thorium to determine whether surface concentrations exceed ALARA values (25 pCi/g for plutonium, 5 pCi/g for thorium). Results of sample screening will be available to field personnel within a few hours of taking the samples, to enable the excavation process to be modified, if necessary, to remove additional soil contamination. Sampling procedures are specified in the FSP (Work Plan, Section 6).

The nature of this real-time sampling approach is such that the results are considered to be approximate, and not as accurate, precise, or to a low-enough detection level that will be required for post-removal (i.e., verification) sampling. Field sampling does not include laboratory analysis, and covers only plutonium and thorium isotopes in those areas selected for excavation. The location of individual removal action samples will be determined on a random sampling basis. At a given cross-section, samples will be taken at locations to be specified in the FSP (Work Plan, Section 6).

Options for removal action sampling include:

1. How/where to analyze samples - Either send samples to the Mound Soil Screening Facility, or use a field instrumentation station setup within OU4.

2. Land survey sample locations - The preferred strategy is not to formally land survey sample locations, but to simply mark sample sites only until results are obtained and evaluated. Sample locations will eventually be backfilled.

5.2. POST-REMOVAL SAMPLING

Following excavation of a defined portion of the OU4 area, soil samples will be taken of the remaining surface contour to verify that the cleanup goal has been achieved. Sampling will be performed in accordance with the post-removal FSP summarized in Section 6 of this Work Plan. The objective of this sampling process is to provide data with which to confirm that the removal action was successful. As such, the FSP describes a program comparable to a CERCLA RI-type approach.

In contrast to sampling during the removal action (Section 5.1), post-removal sampling will include subsurface samples (down to groundwater table or bedrock) and will conform to RI-quality specifications for collection, handling, analysis, and evaluation. Also, samples will be analyzed for a full range of parameters, not just plutonium. The entire OU4 site will be included in the post-removal sampling, whereas sampling during the removal will only include areas associated with the excavation.

Options for post-removal sampling include:

1. When to sample - Sample shortly after excavation has been completed for a section, or not until the entire project is completed.

2. Condition of excavation area - Pre- or post- backfill operations.

3. Scope of sample analysis - Contaminants of concern to only support removal action or a complete Target Analyte List (TAL) to support the project Record of Decision.

Post-removal sampling will include soil only. Groundwater investigation and remediation are included in the Mound OU9 project scope.

6. FIELD SAMPLING PLAN

The work to be performed will be consistent with the FSP prepared for this removal action. A copy of the FSP annotated outline for this plan is provided as Appendix B of this Work Plan. The plan will define the number, location, types, and frequency of field samples to be taken both during this removal action, and to verify attainment of the cleanup goals after the removal. The FSP is consistent with the EG&G Mound OU9 RI/FS Field Sampling Plan and EPA's Methods for Evaluating the Attainment of Clean-up Standards (EPA 230/02-89/042). (EPA 1989).

7. QUALITY ASSURANCE PROJECT PLAN

The work to be performed will be consistent with the QAPjP prepared for this removal action. A copy of the annotated outline for this QAPjP is provided as Appendix C of the Work Plan. The QAPjP is consistent with DOE 10 CFR Part 830.120 and the EG&G Mound RI/FS OU4 Quality Assurance Manual, with additional requirements to include field removal activities. Specific quality assurance requirements are incorporated into written and approved procedures and personnel training. In addition to the Construction Contractor's Quality Assurance (QA) activities, EG&G personnel will also conduct periodic surveillance, inspections, and/or audits to verify compliance throughout the execution of this removal action.

8. HEALTH AND SAFETY PLAN

The work to be performed will be consistent with the HSP prepared for this removal action. The annotated outline for the HSP is provided as Appendix D of this Work Plan. The plan will identify, evaluate, and require controls for all health and safety hazards. The HSP will detail all applicable SOPs, worker training requirements, worker protection, fugitive dust control, air monitoring, sample controls, and general site control measures, for the protection of the public and workers during the removal action. In addition, this HSP provides for emergency response for hazardous operations. The HSP is consistent with OSHA regulations 29 CFR Part 1910.120 and EG&G Mound Technical Manual MD-10286, Issue 15, "Mound Safety and Hygiene Manual," 9/26/94.

9. OTHER ACTIVITIES

This section describes other activities associated with the canal removal action as follows: community relations, access road upgrade project, Mound offsite drainage reroute project, and the Mound rail spur upgrade project. Each of these activities has an impact on, and may be impacted by, this removal project.

9.1. COMMUNITY RELATIONS

Public participation and community relations throughout the removal action project include:

- OU4 MAC group meetings;
- Stakeholder involvement in establishing the cleanup standard;
- Plan to inform MAC of Work Plan progress, and to obtain feedback for Work Plan revisions;
- Public meeting forum (status of removal action will be a topic of future meetings);
- During the removal action community activities will include site displays, presentations, tours, etc. at the Site Community Relations Center; and
- Role of volunteers during removal activities (DOE 1995b).

9.2. ACCESS ROAD PROJECT

The current strategy is to extend the existing access road running along the east side of the Canal, from the Community Park to the Conrail overpass, to proceed under the Conrail trestle and onto the Mound New Property, where it will join an existing site road (see Figure 2.1). Completion of this project, which is shown on the overall removal schedule (Section 11), is crucial to the preferred option for transporting excavated material onto Mound Plant for staging and offsite disposal.

9.3. SITE DRAINAGE REROUTE

DOE has decided to use the occasion of the Canal removal action to re-route the offsite drainage flow directly to the overflow creek, bypassing the South Canal. This strategy will also facilitate the performance of the removal action by permitting the excavation to proceed under dry conditions. As such,

the removal activities in the South Canal cannot proceed according to plan until the current offsite drainage flow in the Canal is halted.

Three options were developed for possible rerouting of the offsite drainage flow:

1. Extend an outfall pipe from Mound Plant boundary to the Great Miami River following the existing right-of-way for NPDES outfall 001 (from just north of the Drainage Ditch due west to the Great Miami River).

2. Install a temporary pipeline and open channel combination along the Mound Plant west property line to the overflow creek.

3. Install a permanent box culvert from the Mound Plant outfall and along the Mound Plant west property line to the overflow creek.

Section 11 contains a preliminary schedule for the removal action. The site drainage re-route may require coordination with the Access Road project (Section 9.2) because the drainage culvert right-of-way passes under the proposed access road path.

9.4. RAIL SPUR UPGRADE

The preferred mode of transportation to move the excavated materials from the Mound Plant staging area to the approved offsite disposal facility (i.e., Envirocare) is by railcar. An existing rail spur from the Conrail tracks running along the western site boundary must be upgraded to permit railcar movement between the staging area and Mound Plant (see Figure 2.1). This project is currently in the planning stage. The upgrade must be completed before offsite shipments can begin, although the Canal removal action can proceed beforehand by staging excavated soils on the Mound Plant site to await disposal. This project will not impact either the access road or site drainage reroute projects.

10. PROJECT ORGANIZATION

The organizational structure for the personnel performing this removal action will be determined by EG&G to ensure that proper lines of authority and safety responsibilities are clearly defined. The removal action project organization will contain the following communication links and job classifications.

10.1. PROJECT MANAGEMENT

The organizational structure for this project is shown in Figures 10.1 and 10.2.

10.1.1. Project Manager

The Project Manager is responsible for the overall operation of the OU4 Removal Action. The Project Manager will act as the point of contact with the EG&G OU4 Manager.

10.1.2. Removal Site Supervisor

The Removal Site Supervisor is responsible for the day-to-day safe operation of the removal action project. The Removal Site Supervisor shall ensure that the Health and Safety Officer is present during all activities indicated in Section 1.4 (Objectives). The Removal Site Supervisor will interact and coordinate the project and schedule with EG&G site organizations (Waste Management, Industrial Hygiene, Health Physics, etc).

10.1.3. Health and Safety Manager

The Health and Safety Manager will complete and oversee the implementation of the HSP, which is subject to EG&G review and approval. The Health and Safety Manager is responsible for selecting the Health and Safety Officer and overseeing that individual's site performance.

10.1.4. Health and Safety Officer

The Health and Safety Officer is responsible for implementing the HSP requirements. This individual is responsible for air monitoring of chemicals and dust, radiation monitoring, frisking personnel and equipment prior to removal from the exclusion zone, maintaining the contamination reduction zone,

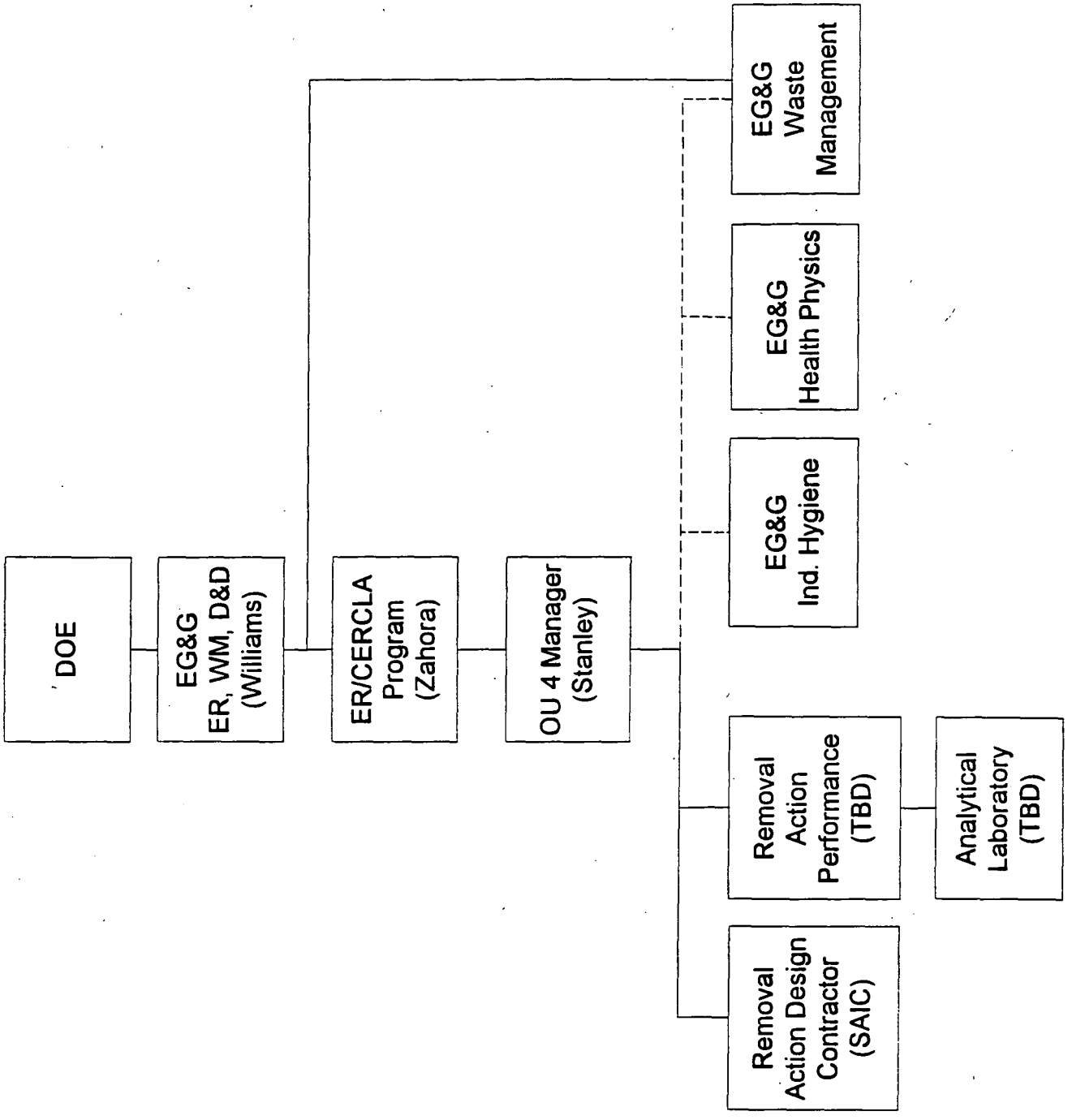


Figure 10.1. Project Organization

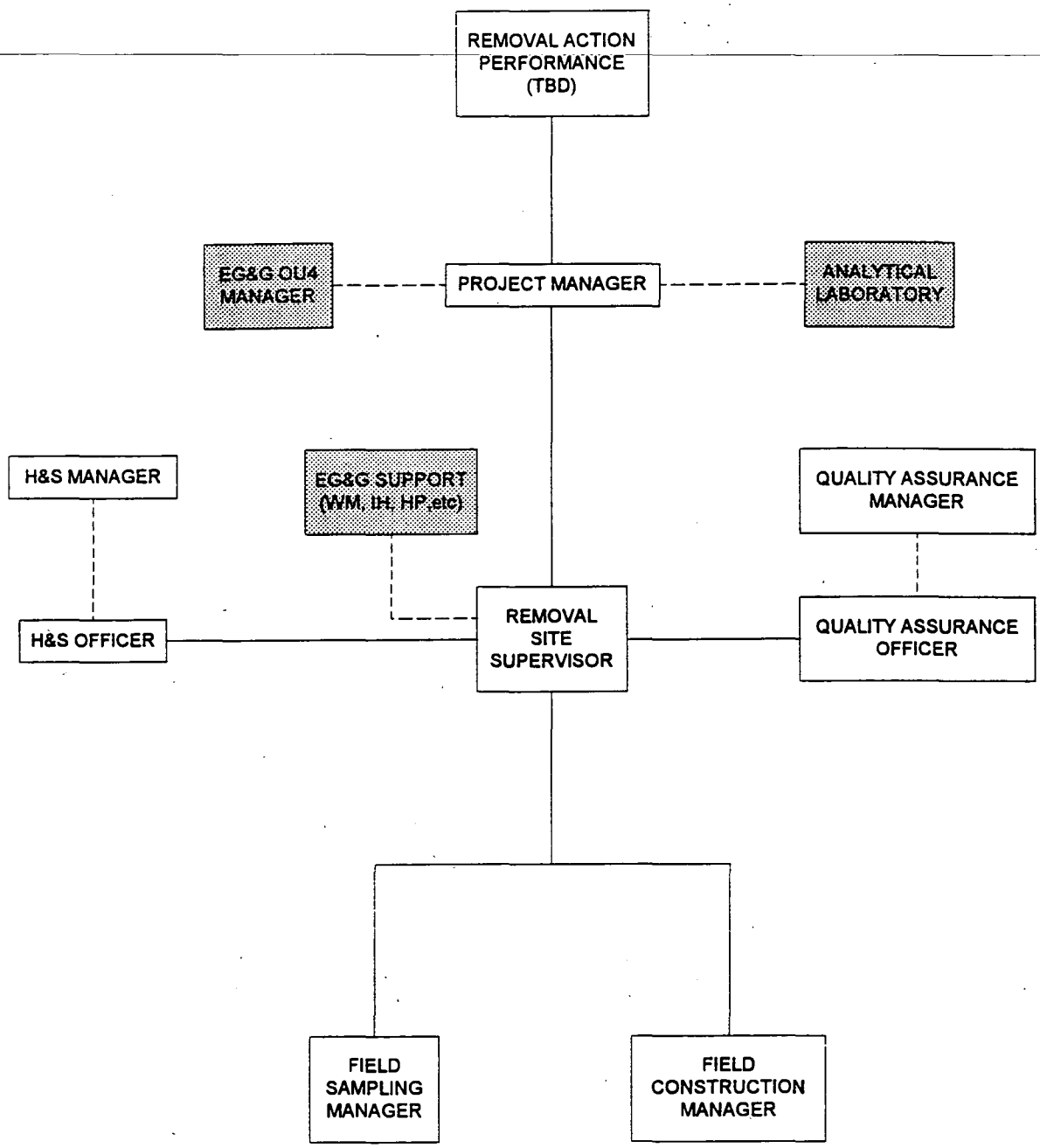


Figure 10.2. Field Organization

overseeing construction safety, and conducting initial site safety training and daily safety briefings.

10.1.5. Quality Assurance Manager

The Quality Assurance Manager Quality Assurance Manager will complete and oversee the implementation of the QAPjP, which is subject to EG&G's review and approval. The Quality Assurance Manager is also responsible for selecting the Quality Assurance Officer and overseeing that individual's site performance.

10.1.6. Quality Assurance Officer

The Quality Assurance Officer is responsible for implementing the QAPjP. This individual is responsible for conducting periodic surveillance of field activities, reporting non-conformances, and ensuring that corrective actions are implemented.

10.1.7. Field Sampling Manager

The Field Sampling Manager is responsible for implementing the FSP. This individual is responsible for the collection, handling, packaging, and documentation of all field samples obtained during the removal action and the verification sampling phases. The Field Sampling Manager shall coordinate all sampling activities with the Field Construction Manager.

10.1.8. Field Construction Manager

The Field Construction Manager is responsible for implementing the excavation plan. This individual is responsible for the clearing and grubbing, surveying, excavation, waste handling and packaging within OU4, backfilling, and construction contingencies during this removal action. The Field Construction Manager shall coordinate all construction activities with the Field Sampling Manager.

10.2. PROJECT IMPLEMENTATION

The options available to DOE for the performance of the removal action as specified in this Work Plan include using EG&G personnel (such as members of the Decontamination and Decommissioning (D&D) department) or an outside environmental contractor.

By using EG&G staff (with specialty subcontractors as required), the removal action can be initiated sooner than if an outside contractor is used, because of the time required to solicit, evaluate, and negotiate with a contractor. In addition, Mound personnel are more familiar with the Mound site, including OU4, than most outside contractors. For example, Mound D&D staff have experience excavating and handling plutonium-contaminated soils.

During the performance of this removal action, the work schedule may be different using Mound personnel versus an outside contractor, but, without knowing each technical approach, it cannot be determined which option would be more expeditious and cost-effective.

Likewise, there appears to be no clear-cut advantage between options in-so-far as availability of tools and equipment to do the removal are concerned.

One potential disadvantage with the option of using Mound personnel is the uncertainty with the availability of knowledgeable staff to meet the current removal action schedule, given the potential reductions in Mound's future budget which may result in staff reductions in key job categories.

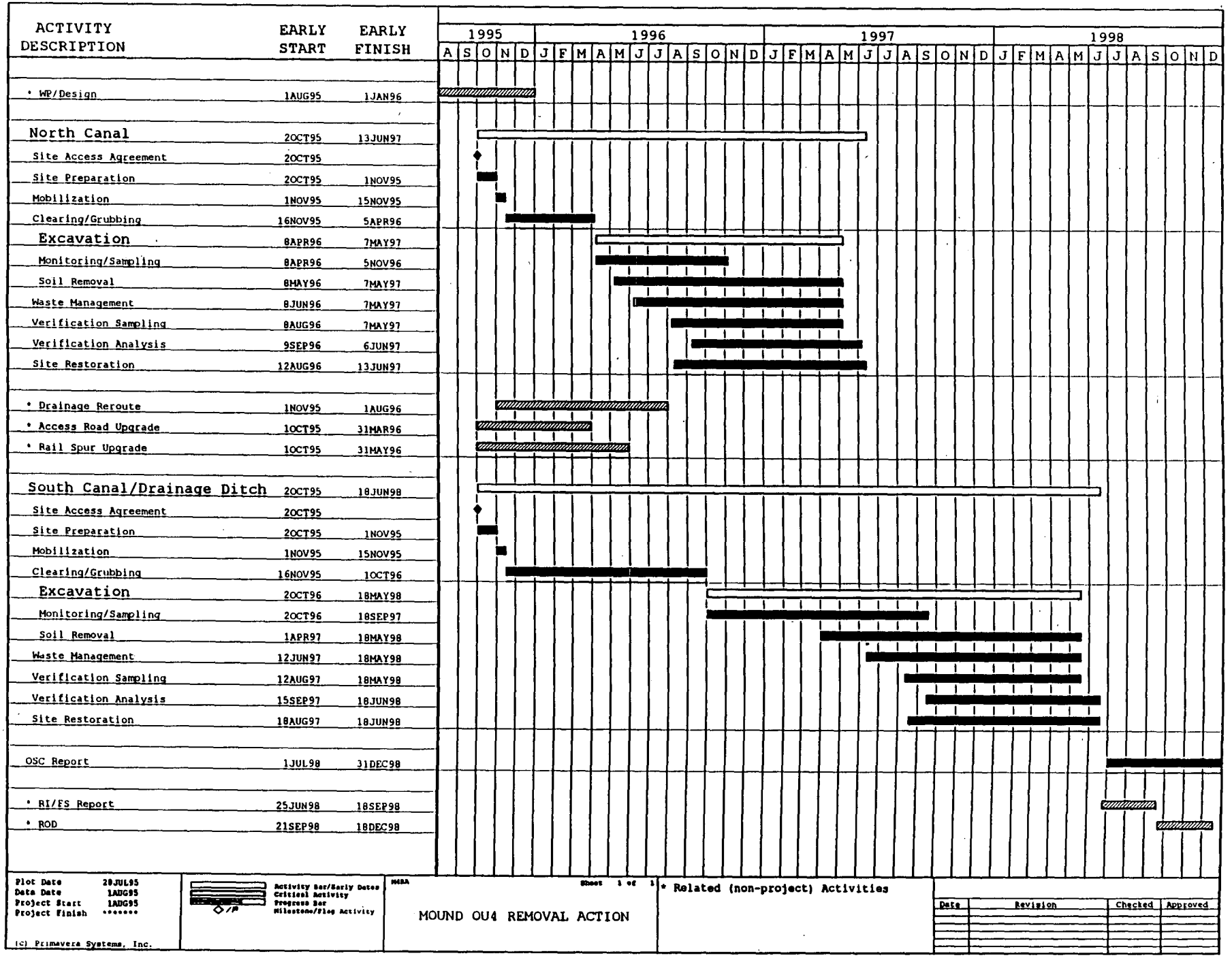
The effort to procure an outside contractor could range from a straight-forward selection process involving current ER Program BOA contractors to open competition. This effort will require anywhere from two to 10 months time, depending on the procurement strategy. However, choosing an outside contractor will permit DOE to obtain a "full service" team having all of the capabilities necessary to perform the removal action.

The choice of which strategy to use needs to be made no later than eight months prior to initial site excavation which could begin by April 1996.

11. SCHEDULE

The schedule for the OU4 removal action is shown in Figure 11.1, which also includes project planning, related projects (reroute of the site drainage, access road and rail spur upgrade), and the post-removal activities related to the OU4 CERCLA program activities (RI/FS, ROD, etc).

Figure 11.1. OU4 Removal Action Work Schedule



12. COST ESTIMATE

The cost estimate for performing the removal action (field portion, plus management support) is shown in Table XII.1. This estimate is based on the following assumptions:

1. The costs associated with the Offsite Drainage Rerouting, Access Road Upgrade, and Rail Spur Upgrade projects have not been included in these estimates.

2. Offsite disposal of excavated soil in "supersacks," via railcar, to Envirocare site in Utah.

3. Volume of soil to be excavated (based on a cleanup standard of 75 pCi/g):

   a. North canal = 214,000 ft^3
   b. South canal = 267,000 ft^3
   c. Drainage ditch = 28,000 ft^3
   TOTAL = 509,000 ft^3 = 18,900 yd^3

4. Volume of soil to be disposed = 26,500 yd^3 (excavated volume increased by 30% to account for uncompacted soil).

5. Rail car capacity is approximately 98 tons.

6. Removal sampling and verification sampling total 1000 samples.

7. Backfill volume equals disposal volume.

8. Work schedule is composed of 52 weeks/year, 5 days/week, 8 hours/day.

9. Costs are based on equipment and labor usage rates obtained from Means (1993).

10. No long-term O&M costs.

Table XII.1. Summary Cost Estimate for OU4 Removal Action

DIRECT CAPITAL COSTS	
Site Preparation	$73,500
Excavation	$3,310,000
Waste Handling	$410,000
Transportation	$2,560,000
Disposal	$6,040,000
Canal Sampling	$2,600,000
Site Restoration	$908,000
TOTAL DIRECT CAPITAL COST	$15,900,000
INDIRECT CAPITAL COSTS	
Field Design Support (3% of Direct Capital Cost)	$477,000
Contingency (10% of Direct Capital Cost)	$1,590,000
TOTAL INDIRECT CAPITAL COST	$2,067,000
TOTAL CAPITAL COST	$17,970,000
Annual Operation and Maintenance Cost	$ 0
TOTAL COST	**$18,000,000**

13. REFERENCES

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DOE. 1995a. "Removal Action Engineering Evaluation/Cost Analysis, Operable Unit 4, Miami-Erie Canal." [Final Revision 1], prepared for the U.S. Department of Energy and EG&G Mound Applied Technologies. January 1995.

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APPENDIX A

LOW-LEVEL WASTE EXEMPTION MEMORANDUM

United States Government Department of En

memorandum

DATE: APR 12 1995

REPLY TO ATTN OF: EH-453 (J. Sands, 427-1012)

SUBJECT: Exemption for Use of Commercial Radioactive Waste Disposal Facilities for Low-Level Waste

TO: Manager, Ohio Field Office

This memorandum approves the use of commercial radioactive waste disposal facilities under Department of Energy (DOE) Order 5820.2A for low-level radioactive waste from the Mound Plant. This exemption is limited to waste consisting of 6000 drums of solidified operations waste and 70,000 cubic yards of soil/debris from operable units 2, 4, and 5 and decommissioning soil and building projects. As such, it constitutes an approved exemption from DOE Order 5820.2A as you requested in your March 17, 1995, memorandum. The conditions are discussed below.

This exemption is consistent with the June 1992 Inspector General Report IG-0308 ("Packaging, Transportation, and Burying of Low-Level Waste").

Conditions

The same conditions that apply to the prior commercial radioactive waste disposal exemption (attached) apply to this exemption; they are as follows:

- Appropriate environmental documentation under the National Environmental Policy Act or the Comprehensive Environmental Response, Compensation, and Liability Act shall be prepared. These documents shall consider several possible waste disposal alternatives, including possible disposal at DOE facilities as well as available commercial facilities.
- Manifests and similar documents shall be prepared for shipment of waste.
- Appropriate procurement or contracting documents shall be prepared for waste disposal services.
- Prior to execution of a contract, the permits, licenses, approvals, and regulatory record of any proposed disposal facility shall be reviewed to establish the types of waste that may be accepted and to assess the operational performance of the facility. This review shall also document that the appropriate low-level waste compact or host State has no objection to the acceptance of DOE waste at the disposal facility. It is strongly encouraged that the DOE field organization communicate with the appropriate low-level waste compact or State staff early in the planning process.
- The waste shall be accurately characterized to ensure the concentrations are within the limits of the license held by the prospective disposal facility.

- Prior to the beginning of each shipment campaign, Waste Management's Program Integration Division, EM-33, shall be notified of the waste type, total volume, and destination.
- Prior to shipment of waste, the regulatory status of the facility shall be confirmed.
- Periodic reviews/audits of the commercial facility or facilities will be conducted by your staff. If there is a continuing use of any particular facility, either (1) these reviews/audits shall be conducted annually, or (2) reference to a similar effort by another DOE entity shall be provided.

Exemption

In consultation with EM-1, an exemption to DOE Order 5820.2A is approved, subject to the above conditions, to allow the specified projects at the Mound Plant to use commercial disposal facilities for radioactive waste whenever commercial disposal represents the best programmatic alternative for managing waste.

for J. E. Grumbly

James N. Gwendoff
Acting Deputy Assistant Secretary
for Environmental Restoration

Attachment
Memorandum from Grumbly to Distribution dated October 12, 1993

Pursuant to DOE Order 5820.2A, the required consultation with the Assistant Secretary for Environment, Safety, and Health has been accomplished for this exemption.

Raymond P. Berube
Deputy Assistant Secretary
for Environment

Date: 4/13/95

Tara O'Toole, M.D., M.P.H.
Assistant Secretary for
Environment, Safety and Health

Date: 4-13-95

APPENDIX B

ANNOTATED OUTLINE OF FIELD SAMPLING PLAN

ANNOTATED OUTLINE FOR MOUND OU4 REMOVAL ACTION FIELD SAMPLING PLAN

The Field Sampling Plan (FSP) is designed to provide guidance for all proposed fieldwork associated with the removal action at the Miami-Erie Canal by defining the sampling and data gathering methods in detail.

The main objective of the FSP is to ensure that the field activities, sampling techniques, and handling procedures meet the data quality objectives stated in the Quality Assurance Project Plan (QAPjP). The FSP will be written so that a field sampling team unfamiliar with the site would be able to gather the required samples and field information. Guidance for the selection and definition of field methods, sampling procedures, and sample custody can be obtained from Mound Plant ER Program Standard Operating Procedures (SOPs) which have been approved by appropriate regulatory agencies and used successfully during other Mound environmental investigations. These SOPs will be used and incorporated into the FSP by reference, to the extent possible.

1. INTRODUCTION

1.1. BACKGROUND

The purpose and scope of the field investigation will be succinctly stated in this section. It will contain an explanation of the problem or opportunity that brought about this sampling effort. The purpose statement will describe exactly what the sampling effort is intended to accomplish and how the resultant data will be used. A well-defined scope will detail expected conditions and contingencies.

1.2. SITE DESCRIPTION

A brief history of the Mound facility and its relationship with the Miami Erie Canal will be described. This section will also present a brief description of the Canal's geologic, geographic, and physical setting. In addition, the OU4 site conceptual model presented in the Work Plan will be discussed to give the reader added perspective into the site interrelationships.

1.3. PREVIOUS SAMPLING AT THE CANAL

A summary of previous investigations conducted within or near the Canal will be presented. This information can be found in previous Mound documents authored by the O&M contractor and subcontractors. If an analysis of existing data is not included in the work plan or the QAPP, it will be included in this section. The analysis will identify specific data needs and discuss how this sampling plan is designed to fill those needs.

1.4. SUSPECTED CONTAMINATION SOURCES

Sources of suspected contamination have been identified based on historic events and the previous sampling conducted at the Canal. These potential sources will be addressed in this section as well as the types of contamination expected.

2. PRELIMINARY FIELD ACTIVITIES

2.1. CONDUCT UTILITY SURVEY

Prior to site clearing and excavation, all existing utilities must be located and identified in the field. The FSP will describe how utilities will be managed in the field sampling program.

2.2. ESTABLISH SITE CONTROLS

Site control mechanisms will be institued as part of the removal action activities. The FSP will describe the potential impact these controls will have on the sampling effort.

2.3. SURFACE WATER REMOVAL

Surface water that collects in the Canal during the removal action may have the potential to come into contact with contaminated soil. This water will be pumped into storage tanks and transferred to the WD Building for management.

This section will describe the impact that surface water (or runoff from storm events) may have on the sampling effort.

3. SAMPLING OBJECTIVES AND RATIONALE

3.1. REMOVAL ACTION SAMPLING

Specific objectives of the real-time field sampling to take place during excavation activities will be outlined. The overall strategy and rationale behind the removal action sampling will be discussed. Justification will be provided for sample strategy tradeoff decisions regarding systematic or judgmental sampling, random or grid-based sampling, and grid size (if used).

3.1.1. Sample Types

The type of samples to be collected during the removal action excavation will be described in this section. Included in this discussion will be a description of sample types collected for analysis by field screening instruments and samples to be analyzed by the Mound Screening Facility or other on-site laboratory (if any).

3.1.2. Sample Locations and Frequency

This section will discuss the proposed sampling locations and the number of samples to be collected for each matrix. A table may be used to clearly identify the number of samples to be collected along with the appropriate number of QC samples.

3.1.3. Sample Collection Procedures and Equipment

A description of the sample collection procedures will be provided. Sampling procedures for each sample matrix will be clearly written. Step-by-step instructions for each type of sampling are necessary to enable the field team to gather data that will meet the data quality objectives. A listing of specific sampling equipment and materials of construction (e.g., teflon, stainless steel) will be provided where necessary.

3.1.4. Sample Analyses

During the excavation activities, samples will be collected for screening with field instruments and for analysis in the Mound Screening Facility. This section will present the analytes of concern for both of these tasks. Minimum detection levels for each analyte and for each method of analysis will be stated.

3.1.5. Cleanup Standards

According to the Work Plan, the excavation program will remove radioactive contaminated soil in accordance with program cleanup protocols. The cleanup standards will be presented in this section as well as the strategy for achieving those standards during the various stages of the removal.

3.2. VERIFICATION SAMPLING

Specific objectives of the verification sampling effort, which will commence after the excavation activities, will be outlined. The overall strategy and rationale behind the verification sampling will be discussed. Justification will be provided for sample strategy tradeoff decisions regarding systematic or judgmental sampling, random or grid-based sampling, and grid size (if used).

3.2.1. Sample Type

The type of samples to be collected during the verification sampling will be described in this section. Included in this discussion will be a description of sample types collected for analysis by field screening instruments, samples to be analyzed by the Mound Screening Facility, and samples designated for off-site laboratory analyses.

3.2.2. Sample Locations and Frequency

This section will discuss the proposed sampling locations and the number of samples to be collected for each matrix. A table will be used to clearly identify the number of samples to be collected along with the appropriate number of QC samples. A figure will be included to show the locations of existing or proposed sample points.

3.2.3. Sample Collection Procedures and Equipment

A detailed description of the sample collection procedures will be provided. Sampling procedures for each sample matrix will be clearly written to enable the field team to gather data that will meet the data quality objectives. A listing of specific sampling equipment and materials of construction (e.g., teflon, stainless steel) will be provided where necessary.

3.2.4. Sample Analyses

Samples obtained during the verification sampling will be retained for screening with field instruments, for analysis at the Mound Screening Facility, and for off-site laboratory analysis. A detailed listing of the analytes of concern for each of these methods will be provided in this section. A table summarizing the proposed analytical parameters for each sample matrix by level of analysis (i.e., field testing, Screening Facility, and laboratory) will be presented for use by field personnel.

4. SAMPLE IDENTIFICATION SCHEME

A unique sample numbering system will be established for this proposed sampling. The sample designation will include such items as the sample number, the sample round, the sample matrix, the depth interval, and the site designation. The sample identification scheme will be consistent with the OU9 Site-Wide Work Plan. This section of the FSP will describe the sample numbering scheme and provide detailed examples of its use.

5. ASSOCIATED FIELD PROCEDURES

5.1. HEALTH AND SAFETY MONITORING

In general, health and safety monitoring will include the use of hand-held field detection instruments for radiological and organic chemical compounds. Although this monitoring will be detailed in the HSP, the information obtained may also be a useful part of the sampling program. The use of these instruments will be described in general, the appropriate Mound Plant ER Program SOPs will be referenced, and the use of data collection forms and field log books will be discussed.

5.2. DECONTAMINATION

Decontamination of field personnel and sampling equipment will generally follow Standard Operating Procedures (SOPs) developed for the Mound Plant ER Program. The appropriate SOPs will be referenced here and any planned deviations or additions will be noted.

5.3. QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

QA/QC samples will be collected during the verification sampling. Although details of these samples will be included in the QAPP, the type and rate of collection of field QA/QC samples will be summarized in this section for use by the field team.

6. SAMPLE CUSTODY AND DOCUMENTATION

6.1. CHAIN OF CUSTODY RECORDS

Sample custody is a major part of the field operation. Chain of custody procedures will be detailed in the QAPP and summarized here for use by field personnel. Procedures for initiating the chain of custody in the field, as well as its final disposition, will be outlined in this section. An example chain of custody form will be provided.

6.2. FIELD LOGBOOKS

A description of the forms, logbooks, and procedures that will be used to record sample history, site sampling conditions, and analyses performed in the field will be presented. Instructions will be included regarding the minimum data recording requirements and specific documentation procedures.

7. SAMPLE HANDLING AND SHIPPING REQUIREMENTS

7.1. SAMPLE CONTAINERS AND PRESERVATION

A table will be provided that identifies the requirements for the type of sample containers, specific analyte preservation techniques, and holding times based on the analytes of concern.

7.2. SAMPLE PACKAGING AND SHIPPING

The requirements for sample packaging and shipping will be detailed, including chain of custody documentation and packaging techniques to maintain constant temperature. To ensure sample integrity during shipment to the laboratory, instructions will be provided for the use of custody seals and the proper disposition of chain of custody documentation and bills of lading.

8. INVESTIGATIVE DERIVED MATERIAL

This section will discuss the types of investigative-derived material (IDM) that will be generated as part of the sampling program. The staging and disposition of the IDM, including any returned lab samples, will be detailed.

9. DATA EVALUATION

Data generated from the laboratory analyses of samples obtained during the verification sampling of the Canal soils will be validated according to EPA protocol. If the chemical and radiological data is determined to be valid, the results will be evaluated to determine if the removal activities were successful in terms of meeting the cleanup standards. This section will briefly explain the level to which the data will be validated and the means of evaluating the data against the cleanup standards. More detailed discussions will be referenced in the OU4 QAPjP and the OU9 Sitewide QAPP (DOE 1993).

10. REFERENCES

A list of all references used in compiling the FSP will be provided, including:

DOE 1993. "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Quality Assurance Project Plan, Revision 3 Final." Environmental Restoration Program, U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. June 1993.

APPENDIX C

ANNOTATED OUTLINE OF QUALITY ASSURANCE PROJECT PLAN

1. INTRODUCTION

1.1. OVERVIEW

General description of the Quality Assurance Project Plan (QAPjP) as it applies to Operable Unit (OU)4 and the removal action at the Miami-Erie Canal.

1.2. ER PROGRAM DESCRIPTION

Refer to OU9 Site-Wide QAPjP (DOE 1993).

1.3. MOUND ER PROGRAM

Refer to OU9 Site-Wide QAPjP (DOE 1993), with the exception that the information will be updated for the recent Federal Facilities Agreement and to include a brief description of removal actions.

1.4. PROJECT DESCRIPTION

Discussion of the physical location of OU4 and the Miami-Erie Canal, as well as an overview of the site background, contaminants of concern and protocol for performing the removal action.

1.5. QAPjP SCOPE

Description of the Quality Assurance/Quality Control (QA/QC) activities which will be applied to the OU4 removal action.

1.6. DATA QUALITY NEEDS AND OBJECTIVES

Description of the Data Quality Objectives (DQOs) for the OU4 removal action sampling and analyses.

2. PROJECT ORGANIZATION RESPONSIBILITY

2.1. OPERATIONAL RESPONSIBILITIES

Flow chart with a brief description of the organizational structures of Department of Energy (DOE) and EG&G Mound Applied Technologies (EG&G) under the Environmental Restoration (ER) Program for the OU4 removal action.

2.2. FIELD TEAM RESPONSIBILITIES

Descriptions of the field team positions and the duties of each.

2.3. LABORATORY RESPONSIBILITIES

Refer to OU9 Site-Wide QAPjP (DOE 1993).

2.4. QUALITY ASSURANCE RESPONSIBILITIES

Refer to OU9 Site-Wide QAPjP (DOE 1993).

3. DESIGN CONTROL

Discussion of the protocol for design document review and design document control.

4. PROCUREMENT CONTROL

Discussion of the protocol for purchasing equipment for the OU4 removal action.

5. WORK PROCESS CONTROL

Discussion of work supervision and performance, as well as obtaining and complying with work permits.

6. HANDLING, STORAGE AND SHIPPING

Description of the handling, storage and shipping procedures to be conducted for waste removal and for the equipment used to perform the removal action at OU4.

7. FIELD MONITORING

Discussion of the monitoring of removal action activities.

8. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION, ACCURACY, REPRESENTATIVENESS, COMPLETENESS AND COMPARABILITY

A brief discussion of Quality Assurance (QA) goals and objectives, followed by detailed tabulated summaries of QA procedures of field and laboratory measurements.

For this Section refer to OU9 Site-Wide QAPjP (DOE 1993) with the exception of replacing the applicable OU9 QC, Standard Operating Procedure (SOP), Sampling Identification and Analytical Method Summary Tables with the corresponding OU4 tables.

9. SAMPLING PROCEDURES

9.1. GENERAL PROCEDURES

Text and tables will address Mound ER Program SOPs, a Sampling Identification Plan, and laboratory analytical methods applicable to sample handling.

9.1.1. Instructions to Field Personnel

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.1.2. Sample Control and Documentation

The OU9 Site-Wide QAPjP will be referenced with the exceptions that "OU4" and the corresponding tables within this QAPjP will replace the OU9-specific text and tables references for this section.

9.1.3. Sample Containers, Preservation and Holding Times

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.1.4. Sample Shipment

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.1.5. Equipment Decontamination

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.2. GENERAL PROCEDURES FOR VERIFICATION SAMPLING

9.2.1. Instructions to Field Personnel

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.2.2. Sample Control and Documentation

The OU9 Site-Wide QAPjP will be referenced with the exceptions that "OU4" and the corresponding tables within this QAPjP will replace the OU9-specific text and tables references for this section.

9.2.3. Sample Containers, Preservation and Holding Times

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.2.4. Sample Shipment

Refer to OU9 Site-Wide QAPjP (DOE 1993).

9.2.5. Equipment Decontamination

Refer to OU9 Site-Wide QAPjP (DOE 1993)

9.3. SOIL/SEDIMENT SAMPLING

Refer to Section 4.3 of the OU9 Site-Wide QAPjP (DOE 1993).

9.4. OTHER FIELD SAMPLING ACTIVITIES

This section will be reserved for future discussion in the event that non-soil media will require sampling during the removal action or as a part of the post-removal action verification activities.

9.5. SUMMARY OF SAMPLING ACTIVITIES

Brief text and a detailed table will provide sampling and analysis information pertaining to the OU4 removal action.

9.6. FIELD VARIANCE SYSTEM

Discussion of the procedures to be followed in the event that major or minor changes from the FSP occur during the OU4 removal action.

10. SAMPLE CUSTODY

10.1. CHAIN OF CUSTODY

Refer to OU9 Site-Wide QAPjP (DOE 1993), substituting "OU4" and "Contractor (TBD)" for "OU9" and "Weston" where applicable.

10.1.1. Field Custody Procedures

Refer to OU9 Site-Wide QAPjP (DOE 1993), substituting "OU4" and "Contractor (TBD)" for "OU9" and "Weston" where applicable.

10.1.2. Laboratory Custody Procedures

Refer to OU9 Site-Wide QAPjP (DOE 1993).

10.2. DOCUMENTATION

10.2.1. Field Logs

Refer to OU9 Site-Wide QAPjP (DOE 1993).

10.2.2. Data Collection Forms

Refer to OU9 Site-Wide QAPjP (DOE 1993).

10.2.3. Corrections to Documentation

Refer to OU9 Site-Wide QAPjP (DOE 1993).

10.2.4. Sample Tracking

Refer to OU9 Site-Wide QAPjP (DOE 1993).

10.3. SAMPLE HANDLING, PACKAGING AND SHIPPING

Refer to OU9 Site-Wide QAPjP (DOE 1993).

10.4. FINAL EVIDENCE FILE DOCUMENTATION

Refer to OU9 Site-Wide QAPjP (DOE 1993).

11. ANALYTICAL PROCEDURES

11.1. FIELD MEASUREMENTS AND SCREENING

Refer to OU9 Site-Wide QAPjP (DOE 1993).

11.1.1. Combustible Gas

Refer to Section 6.1.5 of the OU9 Site-Wide QAPjP (DOE 1993).

11.1.2. Organic Vapor

Refer to Section 6.1.6 of the OU9 Site-Wide QAPjP (DOE 1993).

11.1.3. Radionuclide Screening

Refer to Section 6.1.7 of the OU9 Site-Wide QAPjP (DOE 1993).

11.2. LABORATORY ANALYTICAL METHODS

For this Section refer to OU9 Site-Wide QAPjP (DOE 1993), replacing reference to "OU9" with "OU4". A table of analytical methods, parameters and quantitation limits applicable to the OU4 removal action will be included in this section.

12. CALIBRATION PROCEDURES AND FREQUENCY

12.1. FIELD EQUIPMENT

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.1.1. Photoionization Detector

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.1.2. Explosimeter/Combustible Gas Indicator

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.1.3. Zinc Sulfide Alpha Scintillometer

Refer to Section 7.1.6 of the OU9 Site-Wide QAPjP (DOE 1993).

12.1.4. Field Instrument for the Detection of Low-Energy Radiation (FIDLER)

Refer to Section 7.1.7 of the OU9 Site-Wide QAPjP (DOE 1993).

12.1.5. Flame Ionization Detector (FID)

Refer to Section 7.1.10 of the OU9 QAPjP (DOE 1993).

12.2. LABORATORY EQUIPMENT

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.1. Gas Chromatographic (GC) Analyses

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.2. Gas Chromatography/Mass Spectrometry (GC) Analyses

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.3. Inductivity Coupled Plasma (ICP) and Atomic Absorption (AA) for Metals and Lanthanides and Spectrophotometry for Cyanide

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.4. Alpha Spectrometry

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.5. Gamma Spectrometry

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.6. Liquid Scintillation

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.7. High-Performance Liquid Chromatography (HPLC)

Refer to OU9 Site-Wide QAPjP (DOE 1993).

12.2.8. Cation Exchange Capacity (CEC), Specific Gravity, Particle Size Analysis, Hydraulic Conductivity, Organic Content, Soil Moisture and Relative Density

Refer to Section 7.2.10 of the OU9 Site-Wide QAPjP (DOE 1993).

12.2.9. Gas Chromatography/Mass Spectrometry for Dioxin/Furan Analyses

Refer to Section 7.2.12 of the OU9 Site-Wide QAPjP (DOE 1993).

13. INTERNAL QUALITY CONTROL CHECKS

13.1. SCREENING AND FIELD MEASUREMENTS

Refer to OU9 Site-Wide QAPjP (DOE 1993), with the exception that the referenced table will be Table III.1 of this OU4 QAPjP.

13.2. FIELD SAMPLING

Discussion of quality control procedures using sample blanks and duplicates for soil and sediment sampling.

13.3. LABORATORY ANALYSES

Discussion of internal laboratory quality control procedures which pertain to soil and sediment sampling.

14. DATA REDUCTION, VALIDATION AND REPORTING

14.1. FIELD AND TECHNICAL DATA

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.1.1. Field and Technical Data Reduction

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.1.2. Field and Technical Data Validation

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.1.3. Field and Technical Data Reporting

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.2. LABORATORY DATA

14.2.1. Laboratory Data Reduction

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.2.2. Laboratory Data Validation and Reporting

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.2.2.1. Chemical and Radiological Data Validation

Refer to OU9 Site-Wide QAPjP (DOE 1993).

14.2.2.2. Chemical and Radiological Reporting

Refer to Section 9.2.3.1 of the OU9 Site-Wide QAPjP (DOE 1993).

15. PERFORMANCE AND SYSTEM AUDITS

15.1. FIELD AUDITS

Refer to OU9 Site-Wide QAPjP (DOE 1993).

15.2. LABORATORY AUDITS

Refer to OU9 Site-Wide QAPjP (DOE 1993).

15.2.1. Laboratory System Audits

Refer to OU9 Site-Wide QAPjP (DOE 1993).

15.2.2. Laboratory Performance Audits

Refer to OU9 Site-Wide QAPjP (DOE 1993).

15.2.3. Laboratory Monitoring

Refer to OU9 Site-Wide QAPjP (DOE 1993).

15.3. NONCONFORMANCE REPORTS AND CORRECTIVE ACTIONS

Discussion of procedures used in the event of problems affecting QA.

15.4. ENTRANCE AND EXIT BRIEFINGS

Discussion of QA audits which will be performed with field personnel by the QA Manager.

16. PREVENTATIVE MAINTENANCE

16.1. FIELD EQUIPMENT

Refer to OU9 Site-Wide QAPjP (DOE 1993), with the exception that excavation equipment will be addressed.

16.2. LABORATORY EQUIPMENT

Refer to OU9 Site-Wide QAPjP (DOE 1993).

17. SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION AND COMPLETENESS

Discussion of procedures used which pertain to ER Program SOPs.

18. CORRECTIVE ACTION PROTOCOLS

18.1. INTERNAL CORRECTIVE ACTIONS

Refer to OU9 Site-Wide QAPjP (DOE 1993).

18.1.1. Corrective Actions Resulting from Audits

Refer to OU9 Site-Wide QAPjP (DOE 1993). Corrective Action Report and a Nonconformance Report, and a brief discussion of each example report form.

18.1.2. Corrective Actions Resulting from a Past Activity

Refer to OU9 Site-Wide QAPjP (DOE 1993), with reference to a Corrective Action Report and a Nonconformance Report, and a brief discussion of each example report form.

18.1.3. Corrective Actions Resulting from an Activity at the Time of Occurrence

Refer to OU9 Site-Wide QAPjP (DOE 1993), with reference to a Corrective Action Report and a Nonconformance Report, and a brief discussion of each example report form.

18.2. LABORATORY CORRECTIVE ACTION

Refer to OU9 Site-Wide QAPjP (DOE 1993).

19. QUALITY ASSURANCE REPORTS TO MANAGEMENT

Discussion of QA documentation and the protocol for management reporting and requirements.

20. REFERENCES

List of documents used to prepare to QAPjP of the OU4 removal action, including:

DOE 1993. "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Quality Assurance Project Plan, Revision 3 Final." Environmental Restoration Program, U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM: June 1993.

APPENDIX D

ANNOTATED OUTLINE OF HEALTH AND SAFETY PLAN

ANNOTATED OUTLINE FOR MOUND OU4 REMOVAL ACTION HEALTH AND SAFETY PLAN

1. SITE DESCRIPTION

1.1. SITE LOCATION AND TOPOGRAPHY

Description of the location, including a site map, along with a discussion of the topography of OU4.

1.2. SITE HISTORY

Brief discussion of the history of OU4 including previous studies.

2. CONTAMINANT CHARACTERIZATION

2.1. CONTAMINANTS

Description of Contaminants at OU4.

2.2. PREVIOUS SAMPLING RESULTS

Summary of previous sampling results from OU4 investigations.

3. HAZARD/RISK ANALYSIS

This section will include a task by task breakdown of the hazards that may be encountered by site personnel along with a summary of control measures to be taken for each task.

3.1. TASK SPECIFIC HAZARD ANALYSIS

Hazards to be considered on a task by task basis will include general safety hazards, fire and explosion, biological hazards, confined or enclosed spaces, electrical hazards, temperature extremes, noise, vibration, exposure to chemicals, and exposure to radiation.

3.2. POTENTIAL EXPOSURES

Information including permissible exposure limits; health effects/potential hazards; and exposure routes will be summarized for site contaminants and chemicals that will be used for the removal action.

4. STANDARD OPERATING SAFETY PROCEDURES

This section will present general safety rules, requirements and practices that will apply to the removal action as outlined.

4.1. SITE RULES

4.2. PERMIT REQUIREMENTS

4.3. DRUM/CONTAINER HANDLING

4.4. CONFINED SPACE ENTRY

4.5. HOTWORK, SOURCES OF IGNITION, FIRE PROTECTION

4.6. ELECTRICAL SAFETY

4.7. EXCAVATION AND TRENCH SAFETY

4.8. MACHINE GUARDING

4.9. LOCKOUT/TAGOUT

4.10. FALL PROTECTION

4.11. HAZARD COMMUNICATION

4.12. ILLUMINATION

4.13. SANITATION

5. STAFF ORGANIZATION AND RESPONSIBILITIES

A flow-chart with a discussion of responsibilities will be included in this section. This will be consistent with Section 10 of the Work Plan.

5.1. PROGRAM MANAGER

5.2. HEALTH AND SAFETY MANAGER

5.3. PROJECT MANAGER

5.4. FIELD OPERATIONS MANAGER

5.5. SITE SAFETY AND HEALTH OFFICER

5.6. SUBCONTRACTOR TEAM LEADER

6. TRAINING REQUIREMENTS

6.1. GENERAL TRAINING

Discussion of Health and Safety training and documentation that will be required for on-site personnel.

6.2. SITE SPECIFIC TRAINING

Description of site-specific training and documentation that will be required for on-site personnel.

7. MEDICAL SURVEILLANCE

Discussion of medical surveillance program that will be required for all on-site personnel.

8. EXPOSURE MONITORING

Monitoring requirements and the appropriate action limits will be thoroughly discussed including radiation values requiring classification as a contamination area, and action levels used to select personal protective equipment.

9. SITE CONTROL MEASURES

Discussion of site control zones including establishment, entry requirements, boundaries, and site visitor requirements.

9.1. EXCLUSION ZONE

9.2. CONTAMINATION REDUCTION ZONE

9.3. SUPPORT ZONE

9.4. SITE VISITORS

10. PERSONAL PROTECTIVE EQUIPMENT

This section will discuss the personal protective equipment required in the Hazard/Risk section task breakdown.

10.1. LEVEL C PROTECTIVE EQUIPMENT

10.2. LEVEL D+ PROTECTIVE EQUIPMENT

10.3. LEVEL D PROTECTIVE EQUIPMENT

11. PERSONNEL DECONTAMINATION

Minimum personnel decontamination steps will be outlined by Level of Personal Protective Equipment.

11.1. LEVEL C PROTECTION DECONTAMINATION

11.2. LEVEL D+ PROTECTION DECONTAMINATION

11.3. LEVEL D PROTECTION DECONTAMINATION

12. EMERGENCY PREPAREDNESS

Discussion of emergency procedures.

12.1. EMERGENCY CONTACTS

List of personnel to be contacted in case of emergency, also to include map with evacuation route and route to nearest medical assistance.

12.2. EMERGENCY EQUIPMENT

Description of emergency equipment to be maintained on site.

13. RECORD KEEPING REQUIREMENTS

List of all reports, logs, training, sampling/monitoring results to be maintained.

APPENDIX E

OU4 REMOVAL ACTION ARAR SCREENING SUMMARY

1. INTRODUCTION

The ARARs compiled by DOE, as reviewed by OEPA and USEPA, are shown in the first two columns of Table E.1. The third column indicates whether the ARARs are practicable for the specific alternative selected for the OU4 removal action, i.e., excavation and offsite disposal. The rationale for excluding any of the ARARs is shown in the last column. Those ARARs that remain from this screening process are listed in Section 3.1 of this Work Plan.

Table E.1. OU4 Removal Action ARAR Screening Summary

Chemical-Specific ARAR	Description of ARAR	Applicable to OU4 Removal Action? (yes or no)	Explanation (if excluded)
40 CFR 61 Subpart H	National emission standards for emissions of radionuclides other than radon from DOE facilities	Yes	
40 CFR 141.11-141.16	MCLs for chemical and radiological contaminants	No	Scope of OU4 removal action does not include ground water
40 CFR 141.50-141.51	SDWA MCL Goals	No	Scope of OU4 removal action does not include ground water
40 CFR 191	EPA radiation protection standards for managing and disposing of nuclear fuel, high-level and transuranic radioactive waste	No	OU4 removal action involves only low-level waste
40 CFR 192	EPA environmental standards for uranium and thorium mill tailings and licensed commercial processing sites	No	OU4 removal action does not involve mill tailings or processing waste
40 CFR 264.94	RCRA ground water protection concentration limits	No	Scope of OU4 removal action does not include ground water
10 CFR 20	Standards for protection against radiation	Yes	
10 CFR 61	Licensing requirements for land disposal of radioactive waste	Yes	
OAC 3745-81-15 A,B	MCLs for radium-226, 228, and gross alpha emitters in community water systems	No	Scope of OU4 removal action does not include water

Table E.1. OU4 Removal Action ARAR Screening Summary

OAC 3745-81-16 A,B	MCLs for beta particle and photon radioactivity from man-made sources in the community water systems	No	Scope of OU4 removal action does not include water
CWA 304	Clean water act water quality criteria	No	Scope of OU4 removal action does not include water
Location-Specific ARAR	**Description of ARAR**	**Applicable to OU4 Removal Action? (yes or no)**	**Explanation (if excluded)**
40 CFR 264.18	Regulations regarding siting hazardous waste facilities near fault zones or flood plains	No	Scope of OU4 removal action does not include siting of hazardous waste facilities
40 CFR 6, Appendix A	Executive Order 11988 (Floodplain Management) and 11990 (Protection of Wetlands)	Yes	
OAC 3745-27-07	Regulations which specify locations in which solid waste landfills are not to be sited	No	Siting of landfills is not within the scope of the OU4 removal action
OAC 3745-1-21	Regulations which establish water use designations for stream segments within the Great Miami River basin	No	No change in water use designation is anticipated
CWA 404	Dredge or fill wetland	Yes	
16 USC 661	fish and wildlife coordination act - requires action to protect fish and wildlife from actions modifying streams	Yes	

Table E.1. OU4 Removal Action ARAR Screening Summary

Action-Specific ARAR	Description of ARAR	Applicable to OU4 Removal Action? (yes or no)	Explanation (if excluded)
10 CFR 830.120	DOE Quality Assurance Requirements	Yes	
33 CFR 320 thru 330	Discharge of dredge and fill material to waters of the US	Yes	
40 CFR 122.44	Point source discharge of treatment system effluent to waters of the US	No	Treatment system is not within the scope of the OU4 removal action
40 CFR 230	Discharge of dredge and fill material to waters of the US	Yes	
40 CFR 264.13	Waste analysis	Yes	
40 CFR 264.111	Closure with no post-closure care (e.g.,clean closure)	Yes	
40 CFR 264.117	Restrict post-closure use to prevent damage to cover	No	Capping is not within the scope of the OU4 removal action
40 CFR 264.171 thru 176	Container storage	Yes	
40 CFR 264.228	Surface impoundment closure requirements and post-closure care	Yes	
40 CFR 264.251	Waste piles	Yes	
40 CFR 264.310	Landfill closure requirements and post-closure care	No	Landfill closure is not within the scope of the OU4 removal action
40 CFR 268	Land Disposal Restrictions, excavation and placement	Yes	

Table E.1. OU4 Removal Action ARAR Screening Summary

40 CFR 268.50	Storage of banned waste (e.g., mixed waste)	Yes	
RCRA 40 CFR 260 thru 266	Hazardous waste management	Yes	
RCRA §3004(e)	Dust suppression	Yes	
OAC 3745-15-01 thru 09 and 3745-40-01 thru 04	Requirements include measurement of emissions of air contaminants, scheduled maintenance, reporting and malfunction of equipment	Yes	
OAC 3745-17-01 thru 11	Measurement of ambient air quality and allowable emission standards	Yes	
OAC 3745-22	Establishes criteria for the discharge of dredged or fill material to surface waters	Yes	
OAC 3745-27-01 thru 10	Requirements include authorized solid waste disposal methods, operational requirements for solid waste disposal facilities and closure requirements	Yes	
ORC 3767	Prohibits noxious exhalation or smells, obstruction or pollution of water courses or other nuisances	Yes	
ORC 6111	Prohibits pollution of waters within the State	Yes	

Table E.1. OU4 Removal Action ARAR Screening Summary

33 USC 1318	Guidelines and standards for effluent, pretreatment standards, and discharge of treatment system effluent	No	OU4 removal action does not involve a water treatment system
OSHA 29 CFR 1910	Requirements include general standards for worker protection	Yes	
DOT 49 CFR 172 & 173	Hazardous materials transportation and hazardous material employee training requirements	Yes	
To Be Considered (TBCs)	**Description of TBC**	**Applicable to OU4 Removal Action? (yes or no)**	**Explanation (if excluded)**
40 CFR 300	Superfund off-plant policy and technological approaches to cleanup of radiologically contaminated CERCLA sites	Yes	
DOE Order 5400.5	Radiation protection of the public and the environment	Yes	
EPA RAGS	Provides pathway model to correlate risk and contaminant concentration	No	Will be applicable to post-removal action risk assessment
EPA draft guidance	For cleanup of accidental releases of transuranics to the environment	No	Scope of OU4 Removal Action does not include transurancies
EPA/230/02-89/042	Methods for evaluating the attainment of cleanup standards	Yes	

Table E.1. OU4 Removal Action ARAR Screening Summary

USEPA Health Effects Assessment Guidance	Health Effects Assessment Summary Tables (HEAST) and / or Integrated Risk Information System (IRIS)	No	Will be applicable to post-removal action risk assessment
RCRA	Guidance for implementing RCRA regulations	Yes	
EPA guidance EPA/540/2-88/002	Technological Approaches to the Cleanup of Radiologically Contaminated Superfund Sites (8/88)	No	Removal action technology already selected
NRC proposed policy	Proposed Below Regulatory concern (BRC) dose of 10 mrem/yr	No	Policy withdrawn
DOE/Mound	Mound On-Site Cleanup Policy	No	Superseded by Stakeholder-established cleanup goals
EPA OSWER Directive 9355.0-25A	Use of removal approach to speed up remedial action project (7/89)	Yes	