

Environmental Restoration Program

**ACTION MEMORANDUM**

**POTENTIAL RELEASE SITE 266  
RELEASE BLOCK F  
THORIUM CONTAMINATED SOIL (AREA 8)**

**MOUND PLANT  
MIAMISBURG, OHIO**

January 1996

**PROPOSED FINAL**

(Revision 0)



Department of Energy  
Ohio Field Office

Environmental Restoration Program  
EG&G Mound Applied Technologies

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**PREPARED BY:**

**EG&G Mound Applied Technologies  
P.O. Box 3000  
Miamisburg, Ohio 45343-3000**

**for the**

**U.S. DEPARTMENT OF ENERGY**

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**PROPOSED  
(Revision 0)**

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## ACRONYMS

AEC	Atomic Energy Commission
AM	Action Memorandum
ARARs	Applicable or Relevant and Appropriate Requirements
BGS	Below Ground Surface
BVA	Buried Valley Aquifer
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DOE	Department of Energy
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
FFA	Federal Facilities Agreement
FSP	Field Sampling Plan
ID	Identification
LSA	Low Specific Activity
mrem	millirem
MSL	Mean Sea Level
NCP	National Oil and Hazardous Substances Pollution 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
OU	Operable Unit
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
pCi/g	picocuries per gram
PRS	Potential Release Site
RCRA	Resource Conservation and Recovery Act
RESRAD	Residual Radioactive Material Program

## ACRONYMS (cont.)

RI/FS	Remedial Investigation/Feasibility Study
RSE	Removal Site Evaluation
SARA	Superfund Amendments and Reauthorization Act
SW	Semi-Works
TRU	Transuranic

## **2. SITE CONDITIONS AND BACKGROUND**

### **2.1 SITE DESCRIPTION**

This section describes the physical site location, site characteristics, release of contaminants into the environment and the site's National Priorities List (NPL) status.

#### **2.1.1. Physical Location**

The Mound Plant is a 306-acre site on the south border of the city of Miamisburg in Montgomery County, Ohio. The site is approximately 10 miles south-southwest of Dayton and 45 miles north of Cincinnati. The specific location of the contamination area is defined in the Potential Release Site (PRS) 266 data package, Release Block F, dated August 14, 1995.

#### **2.1.2. Site Characteristics**

The specific site characteristics are described in the PRS 266 data package, Release Block F, dated August 14, 1995.

#### **2.1.3. Release or Threatened Release into the Environment**

The release of Thorium in soil greater than the site standard of 5 pCi/g at the surface and 15 pCi/g 15 cm below the surface prompted this removal action.

#### **2.1.4. National Priorities List Status**

The EPA placed the Mound Plant in Miamisburg, Ohio on the NPL by publication in the Federal Register on November 21, 1989.

### **2.2 OTHER ACTIONS TO DATE**

The Mound Plant initiated a CERCLA program in 1989, now guided by the agreement between the DOE, Ohio Environmental Protection Agency (OEPA), and EPA. A Federal Facilities Agreement (FFA) under CERCLA Section 120 was executed between DOE, EPA Region V, and OEPA on

October 12, 1990, and was revised on July 15, 1993 (EPA Administrative Docket No. OH 890:008 984). The general purposes of this agreement are to:

- Ensure that the environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate remedial action taken as necessary to protect the public health, welfare, and the environment.
- Establish a procedural framework and schedule for developing, implementing, maintaining, and monitoring appropriate response actions at the site in accordance with CERCLA, Superfund Amendments and Reauthorization Act (SARA), the NCP, Superfund guidance and policy, and Resource Conservation and Recovery Act (RCRA) guidance and policy.
- Facilitate cooperation, exchange of information, and participation of the parties in such actions.

#### **2.2.1. Previous Removal Actions**

No previous removal actions at PRS 266 are known.

#### **2.2.2. Current Actions**

Actions to implement a plan for the removal of contaminants associated with PRS 266 are documented in this document.

### **2.3 STATE AND LOCAL AUTHORITIES' ROLES**

#### **2.3.1. State and Local Action to Date**

In 1989, as a result of Mound Plant's placement onto the NPL, DOE and USEPA entered into a FFA which specified the manner in which the Mound CERCLA-based Environmental Restoration (ER) program was to be implemented. In 1994, the FFA was amended to include the OEPA. Under the ER program, DOE remains the lead agency.

### **2.3.2. Potential for Continued State and Local Response**

Eventual release of this area for other commercial (non-DOE) use is planned. Periodic environmental monitoring of the area may be required until a final Record of Decision is implemented for the entire Mound site. This monitoring would need to be coordinated with local, state, and federal authorities.

Current plant-wide environmental monitoring programs will continue until such time as remediation is complete in this and adjacent areas.

### **3. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT**

#### **3.1 THREATS TO PUBLIC HEALTH OR WELFARE**

The disposal or placement of Thorium in the area has created a potential threat to the public health or welfare.

#### **3.2 THREATS TO THE ENVIRONMENT**

The disposal or placement of Thorium in the area has created a potential threat to the environment.

##### **3.2.1. Removal Site Evaluation**

The RSE requirements, as outlined under EPA's NCP regulations in 40 CFR 300.415, are presented throughout this AM. The source and nature of the release are described in PRS 266. An evaluation by public health agencies has not been performed for this area, and therefore is not included in this AM. The determination of the need for a removal action is outlined in this section, in Table III.1.

As regards that determination, the NCP includes eight factors that must be considered in determining the appropriateness of a removal action (40 CFR 300.415(b)(2)). These criteria, as applied for the contamination, are evaluated in Table III.1.

**Table III.1. Evaluation of Removal Action Appropriateness Criteria [40 CFR 300.415(b)(2)]**

Criteria	Evaluation
(i) "...potential exposure to nearby human populations, animals, or the food chain..."	The disposal or placement of Thorium in the area has created a potential threat to the public health or welfare by future excavated surface contamination.
(ii) "Actual or potential contamination of drinking water supplies..."	Potential for erosion into water supplies does exist.
(iii) "Hazardous substances or pollutants of contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;"	None
(iv) "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;"	The presence of Th-232 down gradient indicates that surface soil erosion is a likely pathway for the potential migration of Th-232.
(v) "Weather conditions that may cause hazardous substances to migrate or be released;"	Wind and surface water erosion may cause migration of contaminated soils.
(vi) "Threat of fire or explosion;"	None
(vii) "The availability of other appropriate federal or state response mechanisms to respond to the release;" and	There are no state mechanisms, no other federal mechanisms (DOE is the designated lead agency at Mound under CERCLA), and no other DOE programs to provide an appropriate response.
(viii) "Other situations or factors that may pose threats to public health or welfare or the environment."	None

#### 4. ENDANGERMENT DETERMINATION

Actual or threatened releases of pollutants and contaminants from this site, if not addressed by implementing the response action selected in this AM, may present an imminent and substantial endangerment to public health or welfare or the environment.

## 5. PROPOSED ACTION AND ESTIMATED COSTS

### 5.1 PROPOSED ACTION

The proposed action, in an effort to mitigate contamination migration, is the removal, storage, and disposal of contaminated soils consisting of approximately 6,000 cubic yards. The removal will use on-site interim storage and future off-site permanent disposal.

#### 5.1.1 Proposed Action Description

The proposed action will include:

- Removal of approximately 6-8 inches of soil and gravel covering the contaminated soil.
- Sloped excavation of contaminated soil until surface level of Thorium-232 is at 15 pCi/g or less.
- Filling, interim storage, and shipment of Low Specific Activity (LSA) containers.
- Monitoring the soils during excavation
- Disposal of clean soil in the Mound spoils disposal area.
- Off-site disposal of Thorium contaminated soil
- Verification sampling to verify that cleanup levels have been met.
- Backfilling and site restoration.

The excavated soils will be loaded into Low Specific Activity (LSA) containers, stored in a Mound Plant interim storage location and disposed of based on analytical results and waste characterization. Soil that is characterized to not have Thorium-232 above 5 pCi/g or hazardous chemicals will be considered "clean" and will be disposed of in the Mound spoils disposal area. The contaminated soil will be transported to EnviroCare, in Utah, for disposal.

Groundwater is not expected to be encountered during this removal.

The upper 6 to 8 inches is believed to consist of gravel and soil which was placed over the contaminated soil as a cap. This material would be removed and placed in the Mound Plant spoils disposal area if free of contamination.

The soils below the upper 6-8 inches are considered contaminated with Thorium-232. Each bucket of soil will be scanned using field instrumentation per the Mound Manual MD-80036 and the approved Sampling Plan. The sides of the excavation will be vertically shored or laid back to acceptable slopes for worker protection. The excavation will be performed using a toothless bucket on a suitable excavator. The excavator will load the soils directly into the storage/disposal containers. The containers will be moved to a temporary staging area located near the area.

Monitoring, consisting of only FIDLER screening, and excavation will proceed to the expected depth of 10-14 feet BGS. At this level the footprint of the excavation is planned to be approximately 150 by 150 feet (22,500 sq. ft.).

Migration of the contamination from its original disposal configuration may have occurred, both vertically and laterally. Modification of the excavation to enable pursuit of a limited amount of migrated contamination has been allowed for in the selected sloping and excavation methods, and in the number of storage/disposal boxes available for this removal. However, extensive migration of the contamination can only be removed within the available budget, physical constraints of the site, safety considerations, and excavation equipment limitations.

The excavation will be backfilled with clean imported soils. The backfilled soils will be compacted to the extent practical and safe. The area will be restored by seeding/sodding.

Soils encountered in the excavation will be removed until the surface levels of Thorium-232 are at or below 15 pCi/g. This surface will then be covered by placing a minimum of 15 cm of clean soil.

#### **5.1.1.1. Rationale, Technical Feasibility, and Effectiveness**

The removal action chosen for PRS 266 is necessary for the removal of known contamination and to ensure that migration of the contamination does not occur. The soil placed in the area of PRS 266 represent a volume of high levels of Thorium-232 that can serve as a continuing source of migrating contamination.

#### **5.1.1.2. Monitoring**

Health and safety monitoring will be performed throughout the removal action according to standard Mound procedures. Sampling and analysis of excavated soil will be described in more detail in the PRS 266 Removal Action Work Plan.

#### **5.1.1.3. Uncertainties**

The major uncertainties at the site are the original quantity and contamination levels of Thorium-232 contaminated soil and the lateral extent of migration. The minor uncertainties include location of abandoned utilities and possible unknown utilities that may exist in the area of excavation. The extent of groundwater that may be encountered may depend upon the depth of the excavation and weather conditions. Utility locations will be addressed in the field.

#### **5.1.1.4. Institutional Controls**

DOE will remain in control of the subject area over the near term. However, portions of the Mound Plant may be released to non-DOE uses in the foreseeable future.

#### **5.1.1.5. Soil Treatment/Disposal**

The treatment of excavated soils from this removal is not being considered. The contaminated materials from the excavation will be disposed of off-site. All requirements of the disposal site and any other regulations governing the transportation and disposal of contaminated material will be met.

#### **5.1.1.6. Post-Removal Site Control**

Post removal site control will be provided by DOE/Mound. See Institutional Controls above.

#### **5.1.1.7. Cross-Media Relationships and Potential Adverse Impacts**

The potential cross-media impact associated with the removal action is the potential for unintended release of contaminated materials down gradient and into nearby drainage ditches. Careful monitoring and erosion control will be implemented during the removal action and for the on-site storage of the LSA containers.

No potential adverse impacts of the removal action have been identified.

### **5.1.2. Contribution to Future Remedial Actions**

To facilitate further assessments in or near the site of the removal action, the exact dimensions of the excavation and the levels of contamination identified and removed will be documented. The excavation will be documented by photographs, record drawings, the OSC report, and other information collected during the removal action to further delineate the limits of the excavation.

Because the Mound Plant is anticipated to be cleaned up by removal actions, this clean-up will be a final remedy for this defined problem. The information obtained as a result of this removal will be used in determining the availability for final disposition of the release block and will be subject to review in the release block risk evaluation.

### **5.1.3. Description of Alternative Technologies**

Several alternative technologies were identified and screened for their ability to meet specific criteria for the removal action. Criteria used to screen alternatives include timely response, protection of human health and the environment, effectiveness, implementability and cost. Alternative technologies frequently evaluated for CERCLA remediation include institutional controls, containment, collection, treatment and disposal. Based on the prevailing conditions, the following alternatives (in addition to the proposed alternative of excavation) were developed.

1. No Action
2. Institutional Controls

The performance capabilities of each alternative with respect to the specific criteria is discussed below.

#### **5.1.3.1. No Action**

The "No Action" approach was eliminated from consideration because the need for action has been demonstrated as necessary based on the PRS 266 data package.

### **5.1.3.2. Institutional Controls**

Existing Mound Plant institutional controls effectively minimize the potential for contact of the subject contamination with the general public. Implementation of additional institutional controls to minimize the potential for human contact with the existing contamination will not prevent further migration of the contaminants from the source. Also, institutional controls will be difficult to implement when commercial use of adjacent areas is permitted. Thus, institutional controls were eliminated from further consideration.

### **5.1.4. Engineering Evaluation/Cost Analysis (EE/CA)**

Because this is a time-critical removal, an EE/CA is not required.

### **5.1.5. Applicable, or Relevant and Appropriate Requirements (ARARs)**

Mound ARARs for the ER Program have been identified (DOE 1993b). CERCLA regulations require that removal actions comply with ARARs only to the extent practicable.

The following areas have been identified as applicable, or relevant and appropriate to this removal action:

#### **5.1.5.1. Air Quality**

- Air Pollution (Ohio Administrative codes)
- Particulate Ambient Air Quality Standards (Ohio Administrative codes)
- Particulate Non-Degradation Policy (Ohio Administrative codes)
- Emission Restrictions for Fugitive Dust (Ohio Administrative codes)

#### **5.1.5.2. Worker Safety**

- General Industry Standards (Occupational Safety and Health Act, OSHA)
- Safety and Health Standards (OSHA)

- Recordkeeping, Reporting, and Related Regulations (OSHA)
- Occupational Radiation Protection (Codes of Federal Regulations, CFRs)

#### **5.1.6. Other Standards and Requirements**

Other standards or requirements related to the actual implementation of the response action may be identified subsequently during the design phase and will be incorporated into the Design Work Plan Document.

#### **5.1.7. Project Schedule**

The schedule established for planning and implementing the removal action is shown in Figure 5.1.

### **5.2 ESTIMATED COSTS**

The cost estimate to perform the removal action is shown in Table V.I. Costs include the construction activities, all engineering and construction management, waste disposal, and site restoration. The estimate is based on the removal of approximately 6,000 cubic yards of soil. The cost to perform this removal is presented using EnviroCare as the preferred choice for soil disposal.

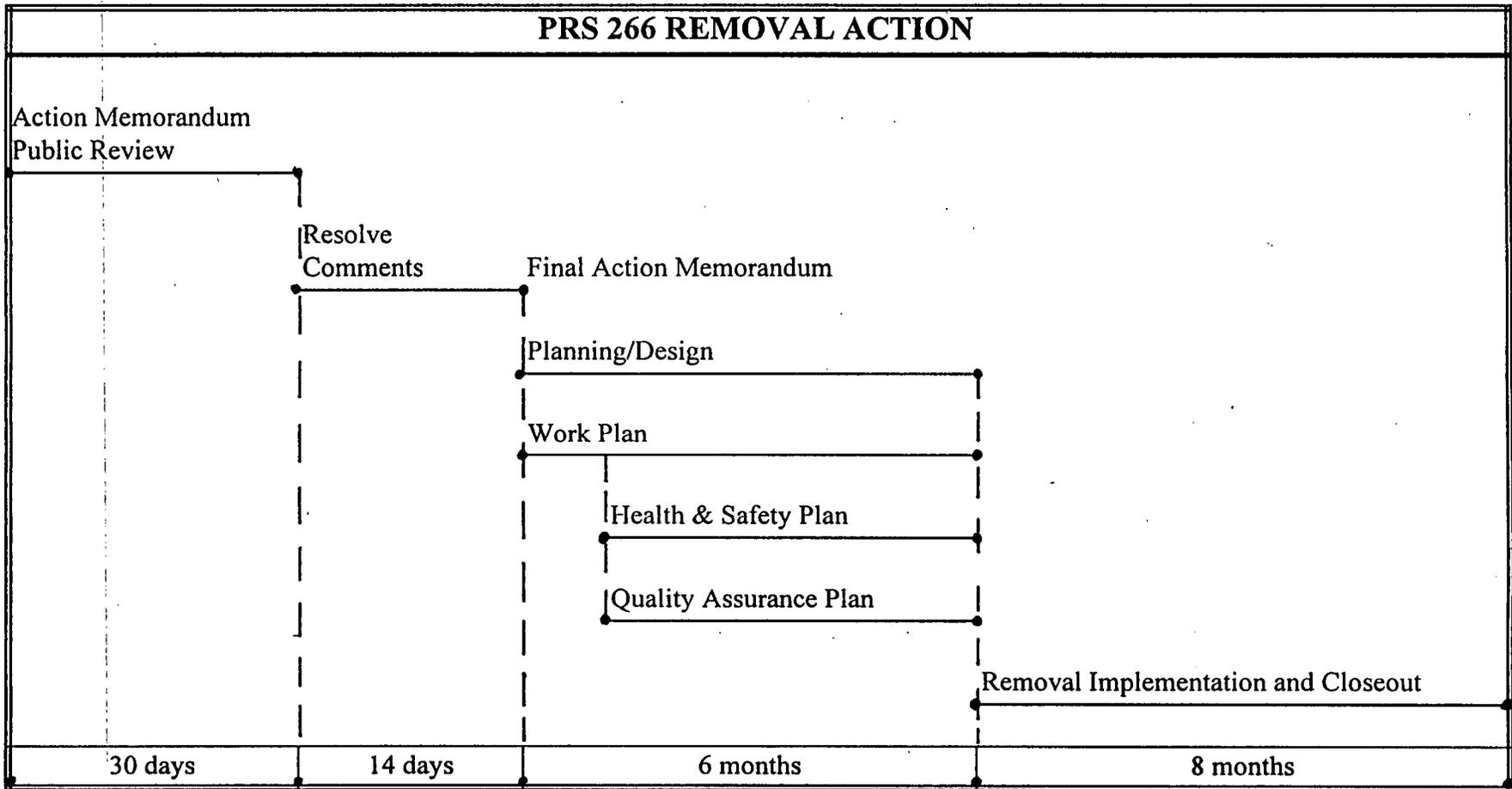


Figure 5.1 Planning and Implementing Schedule.

**Table V.1: Removal Action Cost Estimated**

**I. Cost Using EnviroCare as Preferred Disposal Site**

<b>Activity</b>	<b>Cost (\$x1000)</b>
Engineering/Project Management	\$ 10
Excavation/Sampling/Site Closure	\$2,600
Transportation/Disposal	\$3,800
<b>Total</b>	<b>\$6,410</b>

**6. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR  
NOT TAKEN**

Contamination in the subject area poses a potential threat to public health and welfare and the environment because (see Table III.1): Erosion of soil from the area may migrate into surface waters. Soil conditions will remain with concentration levels exceeding regulatory limits of 5 pCi/g at the surface and 15 pCi/g cm below the surface.

## **7. OUTSTANDING POLICY ISSUES**

There are currently no outstanding policy issues affecting performance of this removal action.

## 8. ENFORCEMENT

The core team consisting of DOE, USEPA, and OEPA has agreed on the need to perform the removal. The DOE is the sole party responsible for implementing this clean-up. Therefore, DOE is undertaking the role of lead agency, per the CERCLA and NCP, for the performance of this removal action. The funding for this removal action will be through DOE budget authorization and no Superfund monies will be required.

9. RECOMMENDATION

This decision document represents the selected removal action for PRS 266, developed in accordance with CERCLA as amended by SARA, and consistent with the NCP. This decision is based on the administrative record for the site.

Conditions at the site meet the NCP Section 300.415 (b)(2) criteria for a removal and we recommend initiation of the response action.

Approved:

Arthur W. Kleinrath 2/14/96  
Arthur W. Kleinrath, DOE/MB, Remedial Project Manager Date

Brian K. Nickel 2/14/96  
Brian K. Nickel, Project Manager OEPA Date

Timothy J. Fischer 2/16/96  
Timothy J. Fischer, Remedial Project Manager USEPA Date

## 10. REFERENCES

USEPA 1990. Superfund Removal Procedures Action Memorandum Guidance. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency. December 1990.

Potential Release Site 266 data package, Release Block F, dated August 14, 1995.