

**ACTION MEMORANDUM
ENGINEERING EVALUATION/COST ANALYSIS**

PRS 99 REMOVAL ACTION

**MOUND PLANT
MIAMISBURG, OHIO**

April 2000

Public Review Draft

(Revision 0)



Department of Energy



BWXT of Ohio

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for the

U.S. DEPARTMENT OF ENERGY

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ACRONYMS

AEC	Atomic Energy Commission
AM	Action Memorandum
AM/EE/CA	Action Memorandum/Engineering Evaluation/Cost Analysis
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	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 (Software)
RI/FS	Remedial Investigation/Feasibility Study
RSE	Removal Site Evaluation
SARA	Superfund Amendments and Reauthorization Act
SW	Semi-Works
TRU	Transuranic
USEPA	United States Environmental Protection Agency

1. PURPOSE

The U.S. Department of Energy (DOE) is the designated lead agency under the Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) and removal actions at the Mound Plant are implemented as federal-lead actions with DOE funds instead of the funds available to the United States Environmental Protection Agency (USEPA) under CERCLA (i.e., non-Superfund). DOE provides the On-Scene Coordinator (OSC). Non-Superfund, federal-lead removal actions are not subject to USEPA limitations on the OSC (\$50,000 authority) and are not subject to National Oil and Hazardous Substances Pollution Contingency Plan (NCP) limitations on removal actions (i.e., \$2,000,000 in cost and 12 months in duration).

This Action Memorandum (AM) has been completed to document the evaluation of site conditions and to allow public input concerning the action described herein.

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 southern 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. This removal action was performed at the Potential Release Site (PRS) 99 which is also referred to as Area 6, WD Building Filter Cleaning Waste. PRS 99 is located in the parking lot south of GH (Guard House) Building. PRS 100, which is also referred to as Area F, Chromium Trench, is nearby. The location of PRS 99 is shown in Figure 2.1.

2.1.2 Site Characteristics

In 1964, at least three 55-gallon drums of polonium²¹⁰ contaminated sand were reportedly placed in PRS 99. The contaminated sand was the waste product generated from sand blasting the metal framework in sand filters located in WD Building. This sand may have also been contaminated with cobalt⁶⁰ and cesium¹³⁷. A report indicates the trench may also contain a polonium contaminated washing machine. This location was reportedly backfilled 15 to 30 feet in depth with clean fill when the parking lot was built.

2.1.3 Release or Threatened Release into the Environment

The discovery during a sampling investigation of soil and debris contaminated with radioactive materials above risk based guideline values prompted this removal action.

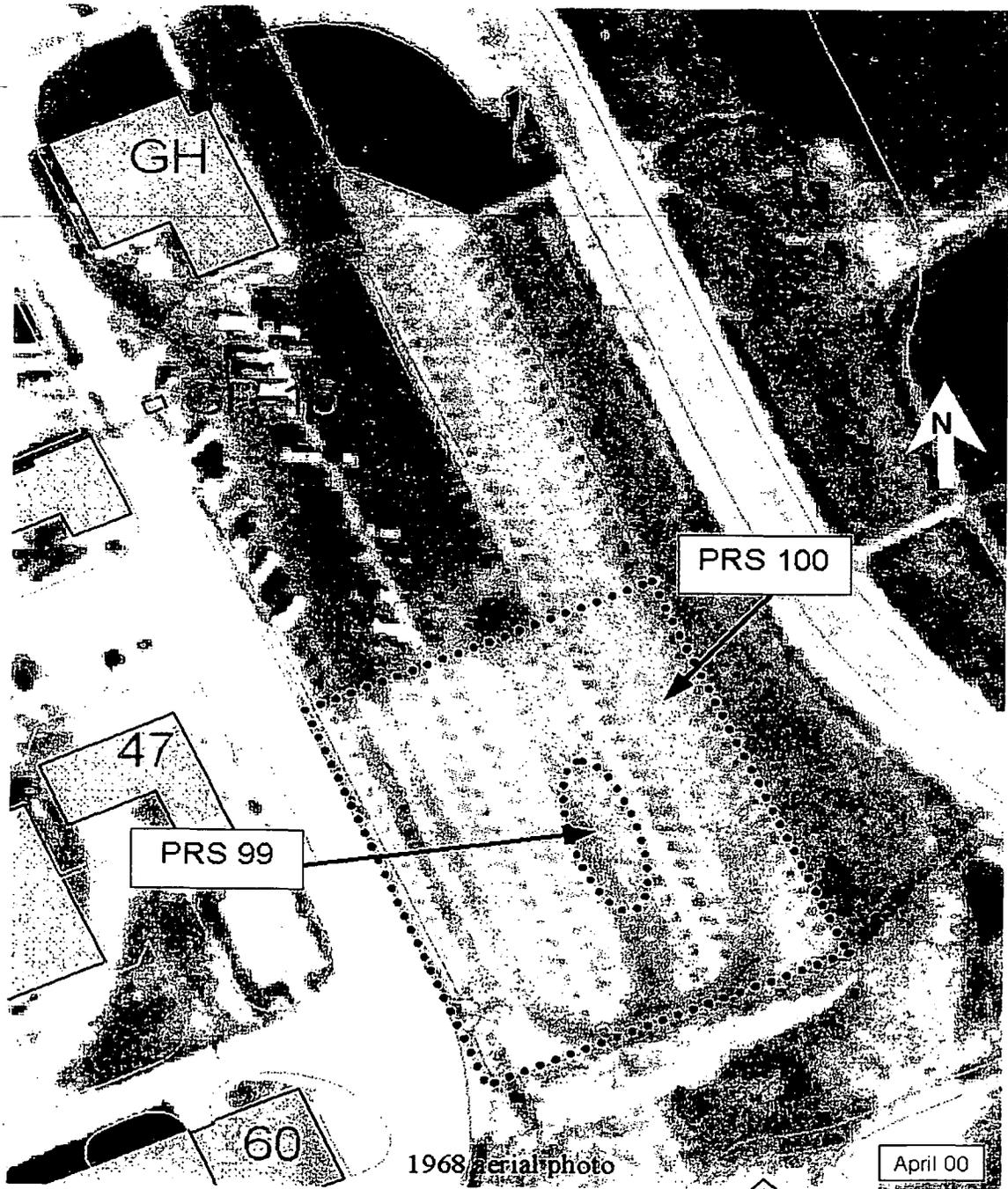


Figure 2.1 Location of PRS 99

2.1.4 National Priorities List Status

The USEPA 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 among the DOE, Ohio Environmental Protection Agency (OEPA), and USEPA. A Federal Facilities Agreement (FFA) under CERCLA Section 120 was executed between DOE and USEPA Region V on October 12, 1990. It was revised on July 15, 1993 (USEPA Administrative Docket No. OH 890-008984) to include OEPA as a signatory. 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 National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Superfund guidance and policy, and Resource Conservation and Recovery Act (RCRA) guidance and policy; and
- facilitate cooperation, exchange of information, and participation of the parties in such actions.

In December, 1995, the core team consisting of representatives of DOE/MEMP, USEPA, and OEPA recommended Further Assessment for PRS 99/100 (DOE 1999c). Phase I characterization of the GH Parking Lot occurred in February, 1999. Of the 137 samples collected from 46 soil borings installed across the lot, only one displayed an elevated level of a contaminant of concern above its risk-based guideline value. Plutonium²³⁸ (120 pCi/g on-site gamma spectrometry, 297 pCi/g off-site isotopic analysis) was associated with one sample that also contained sand. Additional (Phase II) sampling to investigate this location and a previously identified magnetic anomaly was planned and initiated in August, 1999 (See Figure 2.2, 2.3, 2.4.) (DOE 1999a and DOE 1999b). The strategy for Phase II sample acquisition was via trenching. (See Figure 2.5). As the sampling proceeded, sand contaminated with plutonium²³⁸ (up to 839pCi/g) and debris consistent with

was via trenching. (See Figure 2.5). As the sampling proceeded, sand contaminated with plutonium²³⁸ (up to 839pCi/g) and debris consistent with site history were encountered. The debris included over a dozen drums. Most of the drums contained sand, some were empty. In addition, metal framework, conveyor parts, small pieces of lead, flanges, piping, and a sand-filled tank (see Figure 2.6) were found. On August 25, 1999, the Core Team recommended PRS 99 be considered a Removal Action. This recommendation was signed on September 16, 1999 (Appendix A) (Figure 2.7) (DOE 1999c). A flowchart illustrating the history of PRSs 99 and 100 is included as Appendix B.

2.2.1 Previous Removal Actions

No previous removal actions had been performed at this location.

2.2.2 Current Actions

Removal of radioactively contaminated soil and debris is complete. Verification samples were collected on September 23, 1999 and the excavation was backfilled on October 4-5, 1999 following concurrence from DOE & OEPA.

2.3 STATE AND LOCAL AUTHORITIES' ROLES

2.3.1 State and Local Action to Date

In 1989, as a result of Mound Plant being placed onto the NPL, DOE and USEPA entered into a Federal Facilities Agreement (FFA) which specified the manner in which the CERCLA program was to be implemented at Mound. In 1993, the FFA was amended to include the OEPA. DOE remains the lead agency.

2.3.2 Potential for Continued State and Local Response

OEPA will continue its oversight role until all of the terms of the FFA have been met.



Figure 2.2 Sampling Underway in February 1999

April 2000
Mound Plant
Contract #DE-AC24-97OH20044

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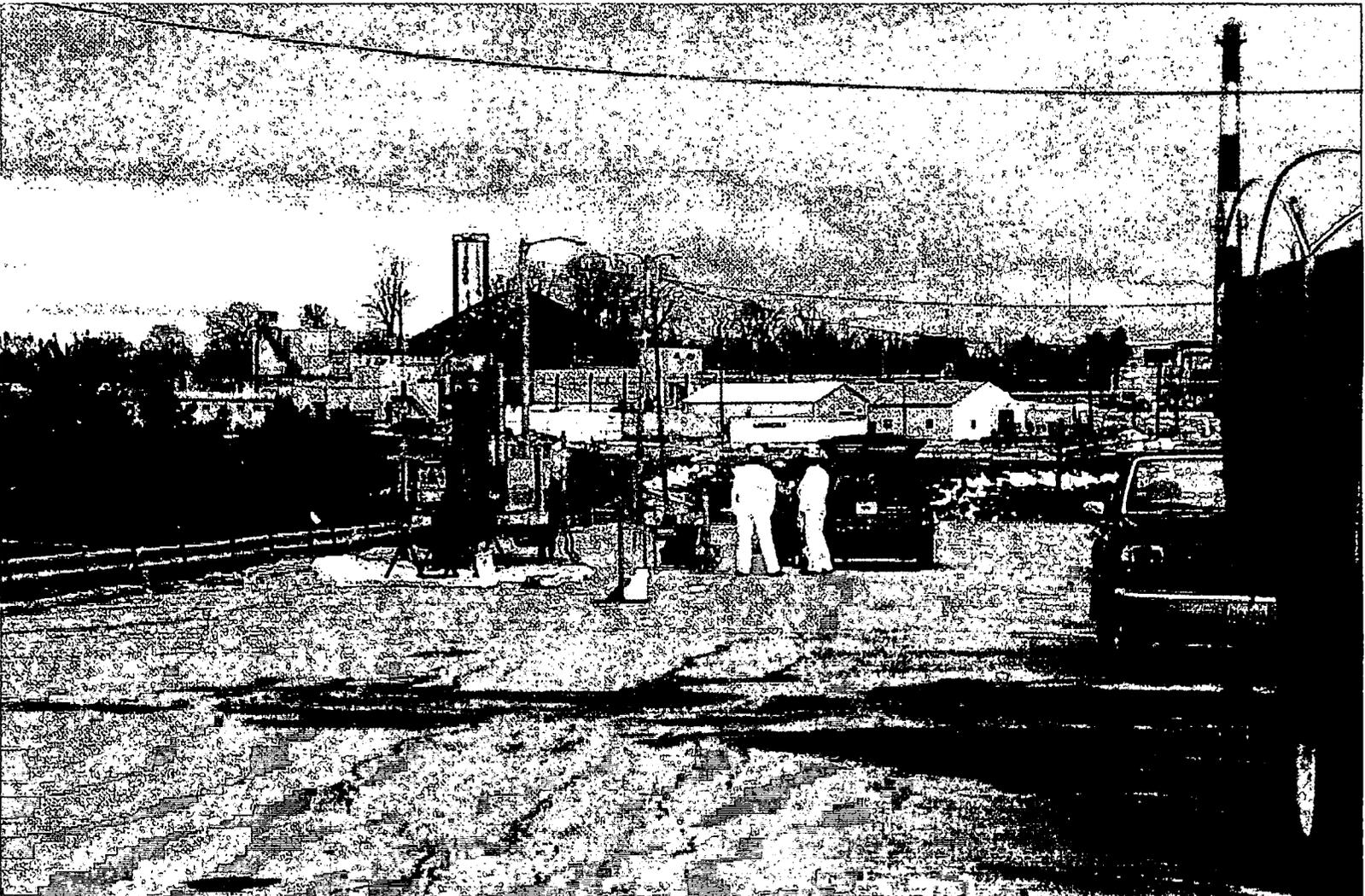


Figure 2.3 Sampling Underway in February 1999

April 2000
Mound Plant
Contract #DE-AC24-97OH20044

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Figure 2.4 Sampling Underway in February 1999



Figure 2.5 Follow-up Sampling in August 1999



Figure 2.6 Metal Debris Removed in August 1999

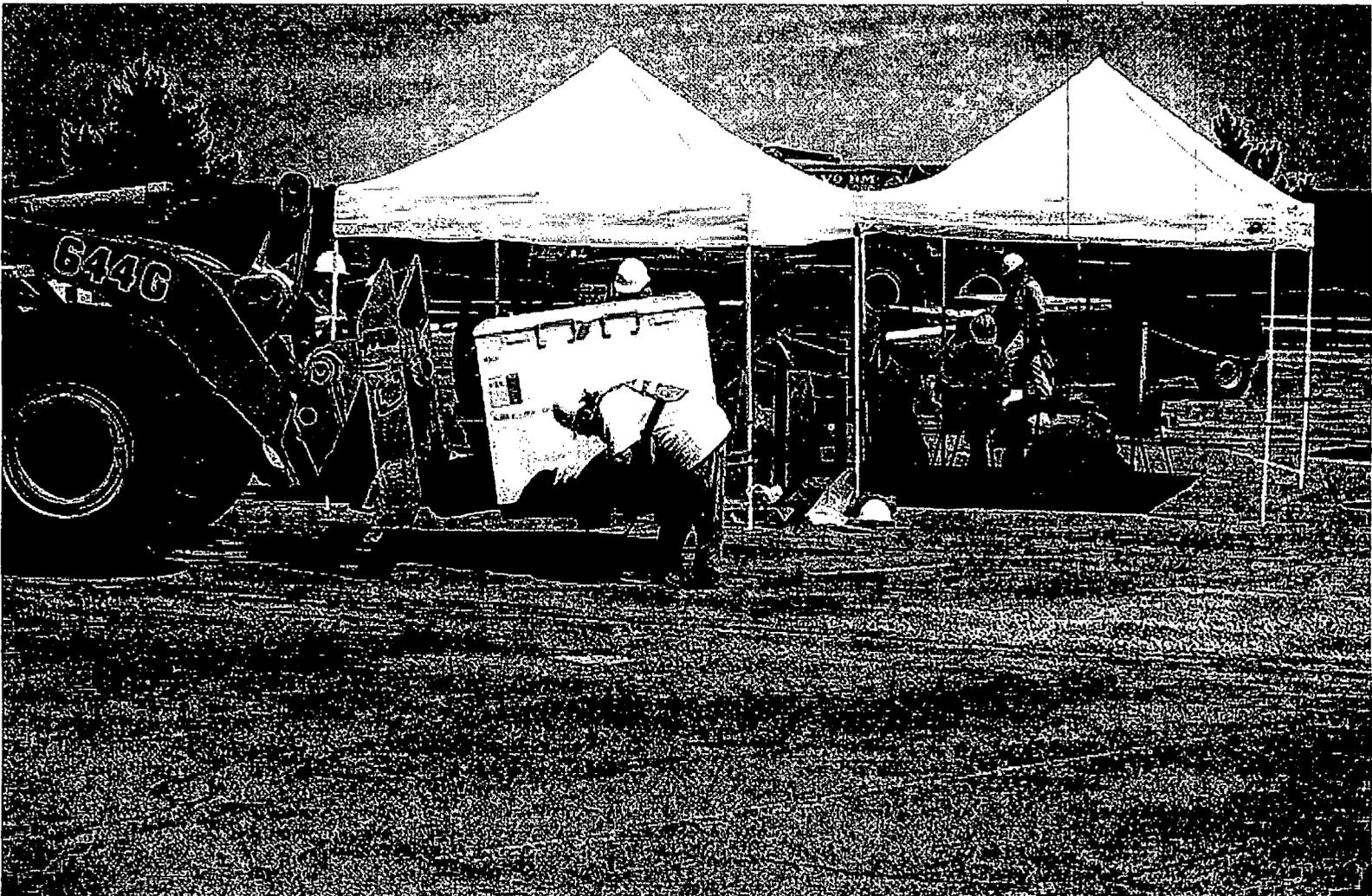


Figure 2.7 Field Activities at Removal Action Site

3. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

3.1 THREATS TO PUBLIC HEALTH OR WELFARE

The concentration of radionuclides observed during the Phase II Sampling was deemed to be a potential threat to the public health or welfare.

3.2 THREATS TO THE ENVIRONMENT

The concentration of radionuclides observed during the Phase II Sampling was deemed to be a potential threat to the environment.

3.2.1 Removal Site Evaluation

The Removal Site Evaluation (RSE) requirements, as outlined under EPA's NCP regulations in 40 CFR 300.415, are presented throughout this AM. An evaluation by public health agencies has not been performed for this area and is therefore not included in this AM.

The NCP identifies eight factors that must be considered in determining the appropriateness of a removal action [40 CFR 300.415(b)(2)]. These criteria are evaluated in Table 3.1.

**Table 3.1 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..."	There was potential exposure to nearby human populations, animals, or the food chain from radionuclides if buried material becomes exposed (i.e., during a construction project).
(ii) "Actual or potential contamination of drinking water supplies..."	There was the potential, albeit remote, for contamination of on-site drinking water supplies from the radionuclides. Contamination in an unlined, buried trench could migrate to the groundwater.
(iii) "Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release;"	This removal action does not address hazardous substances or pollutants in bulk storage containers. However, contaminated sand in drums and a tank were recovered from the excavation.
(iv) "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;"	This removal action does not address high levels of hazardous substances or pollutants or contaminants.
(v) "Weather conditions that may cause hazardous substances to migrate or be released;"	Not applicable. Material is underground and not known to be near the surface.
(vi) "Threat of fire or explosion;"	Not applicable. Site history did not indicate disposal of flammable or explosive material.
(vii) "The availability of other appropriate federal or state response mechanisms to respond to the release;" and	There was no other appropriate federal or state mechanisms to respond. The Federal Facilities Agreement (FFA) established a combined state and federal mechanism to respond under CERCLA. DOE is the designated lead agency at Mound under CERCLA.
(viii) "Other situations or factors that may pose threats to public health or welfare or the environment."	None known.

4. ENDANGERMENT DETERMINATION

There was a potential or threat of release of pollutants or contaminants from this site that could have posed an endangerment to public health or welfare or to the environment. To eliminate the possibility of endangerment, as the site transfers from DOE ownership and control, DOE determined that removal of the contaminants was appropriate.

5. PROPOSED ACTION AND ESTIMATED COSTS

5.1 PROPOSED ACTION

The removal action consisted of the excavation and disposal of radioactively contaminated soil and debris. Since this action was within the site boundaries, it did not have a disproportionate impact on low income or minority populations.

5.1.1 Proposed Action Description

The proposed action is described as follows:

- **Public Notification**

A notice of the availability of this Action Memorandum for 30 day public review will be published in a local newspaper. Responses to comments received during the public review will be published in the final version of the Action Memorandum.

- **Excavation**

This step included among other activities: excavation of soil by heavy duty equipment. Progression and extent of excavation was determined in the field. All excavated soil with contaminant concentrations greater than the cleanup objective were disposed of at a licensed low level waste disposal facility.

- **Verification**

This step included among other activities: sampling and analysis of soil at the limits of excavation to determine the residual contaminant concentration, if any, and confirm that enough material had been removed. This process is typically guided by a Verification Sampling and Analysis Plan. Since this removal action was prompted by discoveries during a sampling event, and to afford continued field work with minimum interruption, the verification sampling approach was negotiated in the field with the regulators. The clean-up objectives are identified in Table 5.1.

- **Site Restoration**

Equipment, materials, waste containers, and boundaries were removed. The site was back-filled and compacted to original contours and elevation.

- Documentation of Completion

Completion of the Contingent Removal Action will be documented by an On-Scene Coordinator (OSC) Report.

5.1.1.1 Rationale, Technical Feasibility, and Effectiveness

The removal action chosen was necessary for the removal of known contamination to ensure that migration of the contamination does not occur.

Table 5.1 Clean-Up Objectives

Contaminant	Risk Based Guideline Values (10^{-5})	Risk Based Guideline Values (10^{-6})	Back-Ground Values	Clean-up Objective
Plutonium ²³⁸	55 pCi/g ^a	5.5 pCi/g	0.13 pCi/g	55 pCi/g ^a
Cobalt ⁶⁰	1.0 pCi/g	0.1 pCi/g	N/A	0.1 pCi/g ^b
Thorium ²²⁸ +D	1.0 pCi/g	0.1 pCi/g	1.5 pCi/g	3.0 pCi/g ^c
Thorium ²³² +D	1.0 pCi/g	0.1 pCi/g	1.4 pCi/g	3.0 pCi/g ^c

^aValue represents 10^{-5} excess cancer risk for the on-site construction worker (DOE 1997).

^bValue represents 10^{-6} excess cancer risk for the on-site construction worker (DOE 1997).

^cCore Team approved As Low As Reasonably Achievable (ALARA) value based on the quantitation limitations of the Mound on-site screening lab.

5.1.1.2 Monitoring

Health and safety monitoring was performed throughout the removal action according to standard Mound procedures. Sampling and analysis of excavated soil was described in more detail in the Work Plan (Final, Rev. 6) for this removal action.

5.1.1.3 Uncertainties

At the start of the removal action, the major uncertainties were the concentration/levels of the contaminants and the extent of contamination (primarily depth).

5.1.1.4 Institutional Controls

PRS 99 is located on property owned by DOE. Access to the property is limited.

5.1.1.5 Post-Removal Site Control

Initially, post removal site control will be provided by DOE/Mound. The Mound Plant is to be sold to Miamisburg Mound Community Improvement Corporation (MMCIC). Currently, PRS 99 is included in Parcel 3 which is expected to be transferred in FY 2000. The institutional and site controls needed at the time of the site transfer in order to ensure future protection of human health and the environment under an industrial reuse scenario will be included in the Record of Decision for Parcel 3.

5.1.1.6 Cross-Media Relationships and Potential Adverse Impacts

The potential cross-media impact associated with the removal action was the potential for unintended release of contaminated materials into the atmosphere. Careful monitoring and control were implemented during the removal action.

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

5.1.2 Contribution to Future Remedial Actions

To facilitate further assessments and removal actions in or near the site of this removal action, the exact dimensions of the excavation and the levels of contamination identified and removed were documented. The On-Scene Coordinator Report documents the removal action with photographs, drawings, and other information collected during the field work. The information obtained, as a result of this removal, will be used in determining the availability of the Mound site for final disposition and will be subject to review in the subsequent risk evaluation.

5.1.3 Description of Alternative Technologies

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 removal of contamination by 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. The core team determined that a Removal Action was warranted (DOE 1999c).

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. However, institutional controls for excavation will be difficult to monitor and enforce after ownership title is transferred. Thus, institutional controls were eliminated from further consideration. A Removal Action was warranted.

5.1.4 Engineering Evaluation/Cost Analysis (EE/CA)

Since there was less than six months planning time for the removal action, an EE/CA was not required.

5.1.5 Applicable, or Relevant and Appropriate Requirements (ARARs)

Mound ARARs for the ER Program have been identified in a letter from OEPA to DOE/MEMP (OEPA 1998). CERCLA regulations require that removal actions comply with ARARs.

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

- 49 CFR 172, 173: DOT hazardous material transportation and employee training requirements.

5.1.5.1 Air Quality

- 40 CFR Part 61 Subpart H: National Emissions Standards for Emissions of Radionuclides other than Radon from Department of Energy Facilities.
- Ohio Administrative Code (OAC) 3745-15-07(A): Air Pollution Nuisances Prohibited.
- OAC 3745-17-02 (A,B,C): Particulate Ambient Air Quality Standards.
- OAC 3745-17-05: Particulate Non-Degradation Policy.

- OAC 3745-17-08: (A1), (A2), (B),(D): Emission Restrictions for Fugitive Dust.

5.1.5.2 To Be Considered

- EPA/230/02-89/042: Methods for Evaluating the Attainment of Cleanup Standards.
- DOE Order 5400.5: Radiation Protection of the Public and the Environment.

5.1.5.3 Worker Safety

- 29 CFR Part 1910: Occupational Safety and Health Act (OSHA) - General Industry Standards.
- 29 CFR Part 1926: Occupational Safety and Health Act (OSHA) - Safety and Health Standards.
- 29 CFR Part 1904: Occupational Safety and Health Act (OSHA) - Record keeping, Reporting, and Related Regulations.

5.1.6 Other Standards and Requirements

No other standards or requirements related to the actual implementation of the removal action were identified.

5.1.7 Project Schedule

The schedule for completing the remaining elements of the removal action is summarized in Table 5.2.

Table 5.2 Schedule Summary

Activity	Start Date	Completion Date
Excavation	August 1999	September 1999
Public Notification	October 1999	April 2000
OSC Report	October 1999	April 2000

5.2 ESTIMATED COSTS

The removal action cost approximately \$521K. Costs include the fieldwork (construction activities, all engineering and construction management), waste transportation and disposal, verification sampling and analysis, and site restoration. A breakdown of estimated costs is provided in Table 5.3.

Table 5.3 Estimated Cost

Description	Cost
Fieldwork	\$400,000
Transportation of Contaminated Soil	\$42,000
Disposal of Contaminated Soil	\$65,000
Verification Sampling & Analysis	\$10,000
Restoration/paving & striping	\$4,000
Estimated total cost	\$521,000

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

Since the removal action has been performed, this section does not apply to PRS 99.

7. OUTSTANDING POLICY ISSUES

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

8. ENFORCEMENT

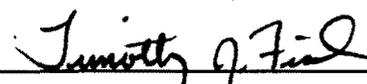
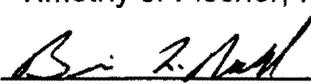
The Core Team consisting of DOE, USEPA, and OEPA agreed on the need to perform this removal action. The work described in this document does not create a waiver of any rights under the FFA, nor is it intended to create a waiver of any rights under the FFA. The DOE is the sole party responsible for implementing this clean-up. Therefore, DOE undertook the role of lead agency, per CERCLA and the NCP, for the performance of this removal action. The funding for this removal action was through DOE budget authorization and no Superfund monies were required.

9. RECOMMENDATION

This decision document represents the selected removal action for the PRS 99, Area 6, WD Building Filter Cleaning Waste site, developed in accordance with CERCLA as amended by SARA, and not inconsistent with the NCP. This decision was based on the administrative record for the site.

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

Approved:

 _____		<u>4/20/2000</u>
Art Kleinrath, On-Scene Coordinator	DOE/MEMP	Date
 _____		<u>4/13/00</u>
Timothy J. Fischer, Remedial Project Manager	USEPA	Date
 _____		<u>4/20/00</u>
Brian K. Nickel, Project Manager	OEPA	Date

10. REFERENCES

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

DOE 1997. Risk-Based Guideline Values, Mound plant, Miamisburg, Ohio, (final, Rev 4), March, 1997.

DOE 1998. List of Ohio Administrative Code and Ohio Revised Code ARARs, Letter from Nickel to Kleinrath, August 19, 1998.

DOE 1999a. PRS 99/100, Sampling and Analysis Plan, January, 1999.

DOE 1999b. PRS 99/100 Work Plan/Phase II Sampling Plan (Final, Rev. 6), September, 1999.

DOE 1999c. PRS 99 Removal Action Recommendation with original 99/100 Package, October, 1999.

APPENDIX A

Core Team Recommendation for PRS 99

**MOUND PLANT RECOMMENDATION
PRS 99
Area 6, WD Building Filter-Cleaning Waste**

Background:

In 1963, chromium plating bath solution and Polonium-210 contaminated sand were disposed of in a trench located below the present parking lot south of GH Building. The trench has been reported to be approximately 100 feet long by 40 feet wide and covered by 15 to 30 feet of fill dirt.

Recommendation:

Binned with PRS 100, PRS 99 is a trench in the parking lot south of GH Building. It was believed to contain drums of Polonium-210 contaminated sand resulting from the sandblast cleaning of the WD Building sand filters. It was thought that the sand may also be contaminated with Cobalt-60 and Cesium-137.

On December 13, 1995, the Core Team recommended *Further Assessment* (FA) for both PRS 99 and PRS 100. Subsequently, the costs of further investigation versus the costs of removing the potentially contaminated soils were evaluated. On July 10, 1997, this evaluation resulted in the decision to continue with the original FA recommendation.

In February 1999, 137 investigative samples were collected from 46 borings in the parking lot south of GH Building to include PRS 99. One sample located in PRS 99 displayed elevated Plutonium-238 in soil at 106 pCi/g, as compared to the Guideline value of 55 pCi/g. A trenching investigation at this location yielded evidence of greater contamination (up to 839 pCi/g of Plutonium-238) over a defined geographic area. The Core Team, therefore, now recommends that a Removal Action be accomplished for PRS 99.

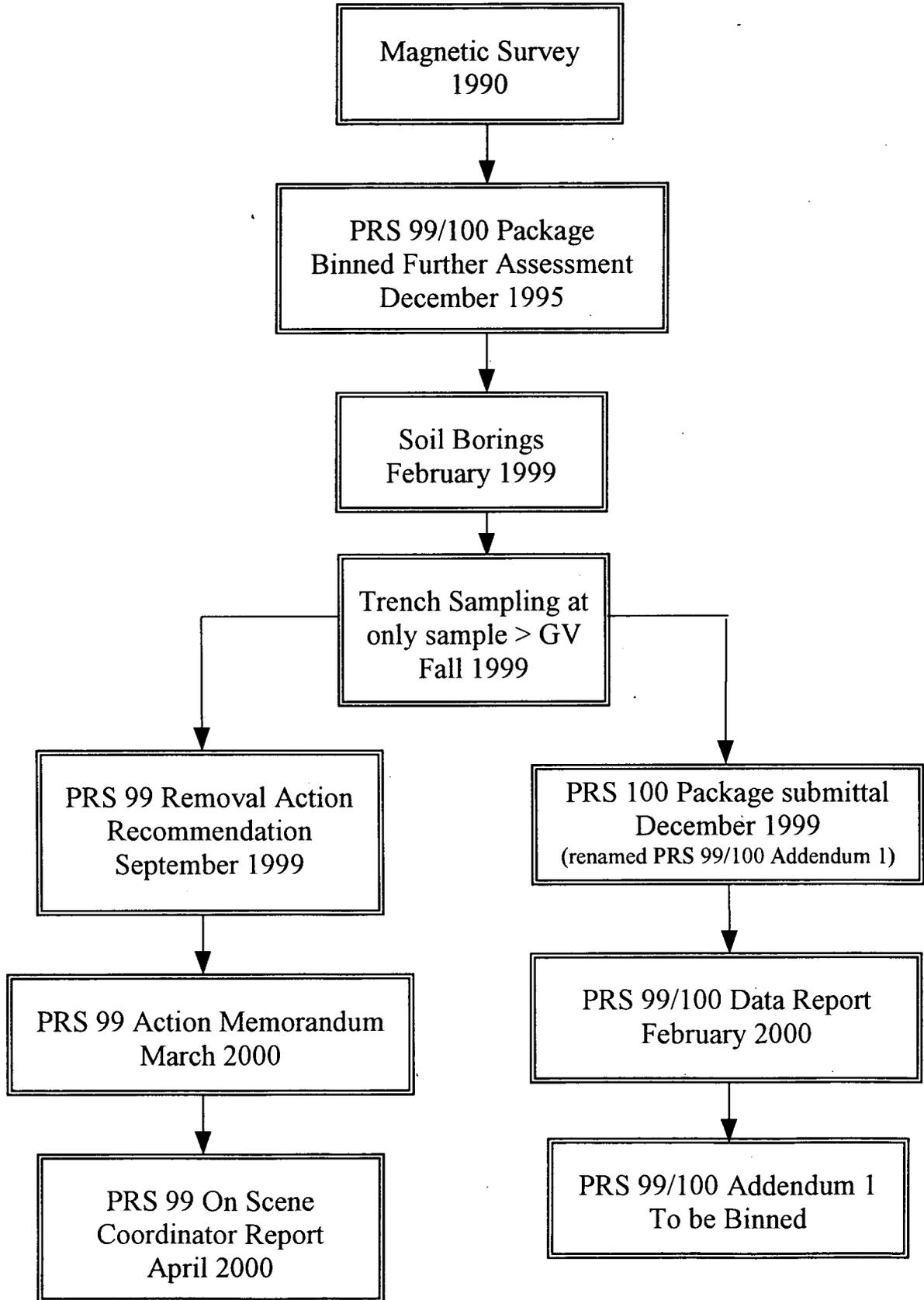
Concurrence:

DOE/MEMP:	<u>Art Kleinrath</u>	<u>9/16/99</u>
	Art Kleinrath, Remedial Project Manager	(date)
USEPA:	<u>Timothy J. Fischer</u>	<u>9/16/99</u>
	Timothy J. Fischer, Remedial Project Manager	(date)
OEPA:	<u>Brian K. Nickel</u>	<u>9/16/99</u>
	Brian K. Nickel, Project Manager	(date)

APPENDIX B

Flowchart Illustrating History of PRSs 99 and 100

History of PRS 99/100



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Contains Proprietary
Information