

3-409.13

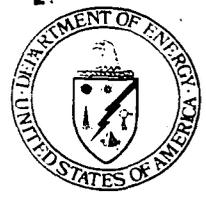
1443



Department of Energy

**Ohio Field Office
Fernald Area Office**

P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155



MAY 18 1998

DOE-0771-98

**Mr. Gene Jablonowski, Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590**

**Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911**

Dear Mr. Jablonowski and Mr. Schneider:

**SUBMITTAL OF COMMENT RESPONSE PACKAGE AND REVISED IMPLEMENTATION PLAN
FOR SCABBLING OF THE PLANT 8 MUFFLE FURNACE AREA**

Reference: Letter, Schneider to Reising, "DOE-FEMP Comments:
Implementation Plan for Scabbling Plant 8," dated March 20, 1998.

The purpose of this letter is to submit the comment response package and a revised Focused Implementation Plan for the Surface Concrete Removal Demonstration in the Plant 8 Muffle Furnace Area for review and approval.

The enclosed comment response package addresses the five comments received from the Ohio Environmental Protection Agency (OEPA) on March 20, 1998, and provides the resulting changes in redline/strikeout form. The U.S. Environmental Protection Agency (U.S. EPA) verbally notified the Department of Energy (DOE) on April 28, 1998, that the agency approved the original version of the implementation plan and would not have any comments. The implementation plan was revised to provide clarification on several topics requested by OEPA and to include an updated implementation schedule.

000001

If you have any questions, please contact John Trygier at (513) 648-3154.

Sincerely,



Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Murphy

Enclosure: As Stated

cc w/enc:

N. Hallein, EM-42/CLOV
J. Saric, USEPA-V, SRF-5J
R. Beaumier, TPSS/DERR, OEPA-Columbus
T. Schneider, OEPA-Dayton (3 copies total of enc.)
F. Bell, ATSDR
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
F. Barker, Tetra Tech
P. R. Courtney, FDF/52-3
L. C. Goidell, FDF/65-2
T. Hagen, FDF/65-2
J. Harmon, FDF/90
D. Paine, FDF/52-4
M. J. Prochaska, FDF/50
T. J. Walsh, FDF/65-2
AR Coordinator, FDF/78

cc w/o enc:

A. Tanner, DOE-FEMP
J. Trygier, DOE-FEMP
R. Heck, FDF/2
S. Hinnefeld, FDF/2
EDC, FDF/52-7

00000:

1443

**FOCUSED IMPLEMENTATION PLAN
FOR SURFACE CONCRETE REMOVAL DEMONSTRATION
IN THE PLANT 8 MUFFLE FURNACE AREA**

COMMENT RESPONSES

United States Department of Energy (DOE) comment responses have been provided on the following pages to address Ohio Environmental Protection Agency (Ohio EPA) comments to the February 1998 Focused Implementation Plan for Surface Removal Demonstration in the Plant 8 Muffle Furnace Area. The U.S. EPA verbally notified DOE on April 28 that it approved the implementation plan without comments.

Ohio EPA comments, dated March 20, 1998, include a total of five comments and are reiterated on the following pages along with DOE responses and a description of action taken. Attached to the comment responses are pages of the implementation plan showing specific revisions made in redline/strikeout text as a result of Ohio EPA comments and one DOE revision — a schedule update in Section 4.0. Additionally, an entire revised edition of the Implementation Plan has been enclosed with this submittal.

**Ohio EPA Comments on the Focused Implementation Plan
for Surface Concrete Removal Demonstration in the Plant 8 Muffle Furnace Area
and DOE Comment Responses**

Ohio EPA Comment #1 (General)

Ohio EPA would like to reiterate DOE's statement that the technology will not be able to meet the OU3 ROD commitment for this area. With less than 70% of the required area being remediated, Ohio EPA will expect the Plant 8 D&D Implementation Plan to address completion of the required scabbling.

DOE Response:

Comment acknowledged. The Focused Implementation Plan has been revised to reflect current contract language regarding scabbling of the concrete floor area in the Plant 8 Muffle Furnace Area (first floor) and to add further clarification. The February 1998 version of the Implementation Plan reflected that the process area footprint equates to 1,705 square feet; however, it must be clarified that only 1,611 square feet of that footprint has concrete that is subject to the removal requirement. The difference between the two areas is due to areas that do not have concrete flooring, namely those occupied by fixed pillars (28 square feet), steel floor drains (62 square feet), and raised piers supporting the legs of the Muffle Furnace (4 square feet).

Further revision of the Implementation Plan was necessary to reflect updated stand-off distance requirements drafted into the contract (based on recently learned reach capabilities of the selected Centrifugal Shot Blasting Technology machine). Initially, approximately 1,148 square feet of concrete was expected to be scabbled during the demonstration. This projection was based on initial assumptions of a 12 inch stand-off distance from vertical surfaces and overhead obstructions preventing access (i.e., dust collector system). Based on further discussions with the chosen vendor, it was learned that the demonstration will employ a machine that is capable of scabbling concrete floor surfaces up to 4 inches from a vertical obstruction. This decrease in stand-off distance equates to 1,526 square feet of projected concrete surface area to be scabbled under this technology demonstration. Therefore, the actual percentage of area planned to be scabbled is 94.7 percent, when compared to the total area (1,611 square feet) that must be scabbled.

000003

It is agreed that the balance of the 1,611 square feet of surface area that remains following the demonstration, which reflects a depth of at least one inch, will be removed under the Plant 8 Complex D&D contract.

DOE Action:

Sections 1.1 and 1.2 of the Focused Implementation Plan have been revised to clarify the total area subject to the scabbling requirement and to reflect the revised scabbling area estimate. Section 2.3 has also been revised to reflect the increased waste volume estimates of Debris Category E (concrete). Please refer to redline/strikeout text in Sections 1.1, 1.2, and 2.3, which illustrate revisions made as a result of this comment.

Ohio EPA Comment #2

[Re: Section 1.2, p. 2, 1st bullet] Ohio EPA is concerned by the suggestion that the technology will result in a "reduction in the quantity of concrete that will be handled for disposition off-site". The ROD is explicit in the quantity of concrete to be removed. Additional clarification of this bullet is required.

DOE Response:

Comment acknowledged. The intent of the text in the first bullet was to reflect that the removal of the top inch of concrete in the first floor of the Muffle Furnace Area for off-site disposal will preclude DOE from having to remove the entire concrete slab and dispose of it offsite. By removing only the top inch of technetium-99 concentrated concrete for off-site disposition, DOE is minimizing the waste that is being shipped offsite, thereby reducing overall remediation costs.

DOE Action:

The first bullet under Section 1.2 has been revised by adding the following: "(i.e., top inch versus the whole slab)". Please refer to redline text in the first bullet of Section 1.2.

Ohio EPA Comment #3

[Re: Section 1.3, p.2, next to last paragraph] The first sentence seems to suggest the muffle furnace was in place for approximately 30 years but only operated for three weeks. Is this correct? Additional discussion regarding how the Tc-99 contamination in the area occurred would be useful for the reviewer.

DOE Response:

Agreed. According to the site process history records, the Muffle Furnace only operated during a three-week test period in 1983. Technetium-99 is a radionuclide produced by fissioning uranium in a nuclear reactor. After the reactor run is finished, the uranium can be recovered and sent for processing. The major source of technetium-99 in OU3 is recycled uranium from the DOE Hanford site, as a trace contaminant not fully removed by the purification processes at Hanford. Process records indicate that the release of this trace contaminant appears to have occurred during the handling (loading and removal) of the recycled uranium in the Muffle Furnace Area.

DOE Action:

The second paragraph of Section 1.3 has been revised to reflect the additional discussion regarding the source of technetium-99. Please refer to redline text in Section 1.3, which illustrates the additional information requested.

Ohio EPA Comment #4

[Re: Section 2.2, p.4, 1st bullet] The required stand-off of the machine significantly limits its usefulness. As described, the technology can remove less than 70% of the required concrete area. Hopefully, there are benefits to the technology, that have not been clearly provided in the document, to offset such a substantial limitation.

DOE Response:

Please refer to the DOE response for Ohio EPA Comment #1.

Regarding the benefits of this technology, DOE, in its continued commitment to invest in technology advancement, believes that the Centrifugal Shot Blasting Technology has definite benefits. Although the primary focus of the Implementation Plan is to present the method of surface concrete removal and implementation schedule, DOE will closely evaluate this demonstration to assess and quantify its benefits and efficiency in a report specifically prepared for that purpose (as opposed to the Project Completion Report referenced in Section 4.0 of the Implementation Plan). The report, addressing technology performance assessment, is expected to be prepared concurrent with the Project Completion Report and will be provided as an attachment as was previously done (for a different demonstration) with the Plant 1 Complex - Phase I Project Completion Report (December 1997).

Based on studies and results of previous small-scale demonstrations of this technology, it appears that there are several potential benefits when compared to baseline technologies (e.g., mechanical planing/scraping equipment). Significant benefits are expected in at least the areas of worker and environmental protection (reduced particulate emissions) and waste minimization (volume and size reduction).

DOE Action:

Please refer to the action taken for Ohio EPA Comment #1.

Ohio EPA Comment #5

[Re: Section 2.3, p. 4, bullets] The information provided suggest the technology generates a 3:1 unbulked or 5:1 bulked ratio of secondary waste to target waste. The ratio seems extraordinarily high, though no information regarding the baseline technology is provided. This certainly does not provide a persuasive argument for use of the technology. Additional information regarding the secondary waste from the baseline technology should be provided.

DOE Response:

Information regarding secondary waste from a baseline technology applied at a comparable (radiological) site is not available. The original estimate for secondary waste, which primarily consists of personal protective equipment, was conservatively estimated for this project for the purpose of allocating sufficient waste containers (drums). This estimate has been revised to reflect more accurate figures for the implementation plan. Please note that the bulking factor for concrete was also revised to be 1 rather than 1.5 to reflect the expected absence of void space in the drums during deposition by the centrifugal shot blasting machine. Actual volumes of the debris categories will be presented in the Project Completion Report, whereupon actual secondary waste to primary waste ratios may be determined.

DOE Action:

Waste volume estimates have been revised to reflect updated quantities. Please refer to redline/strikeout text in Section 2.3, which illustrates the revised waste volume estimates.

**REDLINE/STRIKEOUT REVISIONS
FOR THE FOCUSED
IMPLEMENTATION PLAN FOR SURFACE CONCRETE REMOVAL DEMONSTRATION
IN THE PLANT 8 MUFFLE FURNACE AREA**

1.0 INTRODUCTION

1.1 Project Statement

In accordance with the strategy for implementing remedial action for Operable Unit 3 (OU3) at the Fernald Environmental Management Project (FEMP), pursuant to the OU3 Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997), this focused implementation plan has been prepared to document applicable engineering design elements and implementation strategies for the removal of a specified quantity of surficial concrete from the first floor of the Plant 8 Muffle Furnace Area. The removal and off-site disposition of the top inch of concrete from the first floor of the Plant 8 Muffle Furnace Area was identified as a requirement, among several other areas in OU3 that contain the highest levels of technetium-99 (Tc-99) in debris, in the OU3 Record of Decision for Final Remedial Action (ROD) (DOE 1996). The OU3 Integrated RD/RA Work Plan further specified the removal and off-site disposition of this concrete.

Although the decontamination and dismantlement (D&D) of the Plant 8 Complex, which includes the Muffle Furnace Area, is not planned for project implementation until fiscal year 2002, decontamination activity in support of that D&D project is being accelerated as a result of a U.S. Department of Energy (DOE) field technology demonstration initiative. The decontamination activity includes the removal of the top inch of most of the concrete from the first floor of the Muffle Furnace Area, which is estimated to include approximately 1,148 1,526 square feet of the 4,705-1,611 square feet footprint of concrete floor surface area defined for that first floor process area. The field demonstration of new and innovative, proven technologies is sponsored by the DOE Office of Science and Technology, Deactivation and Decommissioning Focus Area - Large Scale Technology Demonstration (LSTD) Project. Other field demonstrations under this program began at the FEMP in 1996 during the Plant 1 Complex - Phase I D&D project and were documented in the Project Completion Report for that project (DOE 1998).

The three primary reasons for implementing this field demonstration at this time are to:

- continue to meet the FEMP's commitment for LSTD demonstrations under a 1995 agreement between the site and the DOE Office of Science and Technology;
- apply a recently developed and proven technology to an area in OU3 that can benefit from such technology to meet a requirement of the OU3 ROD for Final Remedial Action; and
- act in accordance with DOE's statement in the Responsiveness Summary of the OU3 ROD that "DOE is thoroughly committed to the review-and-improve philosophy...and will continue to invest in technology advancement to benefit its remediation projects."

1.2 Scope of Work

The technology chosen for the demonstration is called Centrifugal Shot Blasting. The demonstration will provide an opportunity to assess an in situ approach to volumetric decontamination of concrete floor surfaces. The objectives of the demonstration include the following:

000007

1443

- reduction in the quantity of concrete that will be handled for disposition offsite (i.e., top inch versus the whole slab);
- reduction in the amount of secondary waste that will be generated during the decontamination process;
- provide a cost effective concrete decontamination process; and
- provide a direct comparison to baseline concrete removal technologies.

The specific scope of work includes the removal of the top inch of concrete in the first floor of the Muffle Furnace Area (Process Area 4) of Plant 8, an area having dimensions of approximately 31 feet x 55 feet. Of the areal footprint of 1,705 square feet, only 1,611 square feet has concrete that is subject to the removal requirement. The difference between the two areas is due to areas that do not have concrete flooring, namely those occupied by fixed pillars (28 square feet), steel floor drains (62 square feet), and raised piers supporting the legs of the Muffle Furnace (4 square feet). Due to a the vendor-reported four inch stand-off limitation of the ~~technology~~ scabbling machine around vertical obstructions (e.g., fixed columns) and floor anomalies (e.g., trench grating), it is estimated that only 1,526 square feet of the 1,705-1,611 square feet in the Muffle Furnace Area will be removed using this technology. Removal of the top inch from the estimated 557-85 square feet of remaining concrete will be performed in conjunction with the D&D subcontract associated with the Plant 8 Complex. The implementation plan for the D&D of the Plant 8 Complex will specify the requirement to remove all remaining surface concrete down to one inch for the remaining Muffle Furnace Area, including both first and second floors.

The centrifugal shot blasting technology will remove and collect waste produced during the removal of the concrete while also controlling the potential spread of contamination in the operating area using built-in engineering controls and operating procedures.

1.3 Project Area Description

The first floor of the Muffle Furnace Area was delineated in the OU3 Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum (DOE 1993), which was described in text in Section D.9.3.12 and illustrated in Figure 8A-1 as Process Area 4. From that process area definition, a more detailed plan view of the project area was prepared during project design and is shown as Attachment 1 (Drawing No. 08X-5500-X-03726). Three photographs of the project area are shown in Attachment 2.

The Muffle Furnace Area includes a single-hearth furnace built in the 1950s, which was used only for a three-week test period in 1983 and was closed in-place in 1985. The furnace was operated with variable retention times to obtain complete oxidation of the feed material. Materials fed into the furnace during the 1983 test period included off-specification green salt and filter cake with a high lime content. Upon completion of the test, the furnace was run to "dead bed", thereby recovering end product — calcium uranate. The end product was returned to the production operation in the Ore Refinery Plant. Technetium-99 is a radionuclide produced by fissioning uranium in a nuclear reactor. After the reactor run is finished, the uranium can be recovered and sent for processing. The major source of technetium-99 in OU3 is recycled uranium from the DOE Hanford site, as a trace contaminant not fully removed by the purification processes at Hanford. Process records indicate that the release of this trace contaminant appears to have occurred during the handling (loading and

000008

1443

removal) of the recycled uranium in the Muffle Furnace Area.

As a result of the OU3 ROD adoption of 105 grams of Tc-99 (~~a trace impurity in recycled uranium~~)—as the allowable mass for on-property disposal of OU3 debris, the OU3 ROD identified the areas in OU3 having the greatest source terms of Tc-99. Since the Muffle Furnace Area of Plant 8 was found to contain a significant quantity of Tc-99, it was identified as one of the four areas in OU3 that would have to undergo surface concrete removal prior to disposing of the remaining concrete in the On-Site Disposal Facility (OSDF). Since only the first floor of the Muffle Furnace Area will be scabbed under this technology demonstration, surface concrete residing on the second floor of this process area will take place under the scope of the Plant 8 Complex D&D project.

2.0 PROJECT EXECUTION

2.1 Preparatory Actions

Safe shutdown of Plant 8 is ongoing, as of the preparation of this document, but is expected to be complete by mid-March 1998. Safe Shutdown preparation includes removal of any hold-up material present in process equipment and conveyance lines, removal of salvageable equipment, utility disconnection, and sealing building openings to ensure a contained work environment.

The technology demonstration subcontract will be written in a manner similar to OU3 D&D subcontracts, whereas the subcontractor will have to adhere to the performance specifications (discussed in Section 2.2) included in the procurement documentation. Under the subcontract statement of work (SOW), the technology subcontractor will prepare a work plan, subject to FEMP review and approval, that describes the specific system design for removing concrete. The work plan will describe methods and equipment for removing concrete, including equipment to be used for controlling, filtering, and collection of waste generated during removal activities. The work plan will also describe the methods and equipment used to contain contaminants. The subcontractor will also submit for review the manufacturer's technical information on all materials to be used, including the intended use and application instructions.

2.2 Method/Equipment Requirements

The subcontractor will be required to supply a system with all equipment necessary to remove the top inch of concrete over as much of the first floor in the Muffle Furnace Area as possible given the limitations of the technology, including equipment to control, filter, and collect waste generated from the process. The specifications for the concrete removal system include the following features:

- integral vacuum system with pre-filters and high efficiency particulate air (HEPA) filters;
- controlled, dustless process;
- no use of water on surfaces that would allow Tc-99 to migrate;
- equipment shall be portable;

000009

15 14 19

- equipment should be easily decontaminated for free-release after project completion;
- equipment shall implement waste management technology that minimizes secondary waste; and
- the equipment shall have a vacuum design that allows the operator to fill, seal, remove, and replace the waste collection drum under negative pressure vacuum conditions/enclosures.

The subcontractor will also be required to satisfy the following requirements:

- provide method(s) and equipment necessary to remove concrete to within twelve inches, with a goal of reaching within ten inches, of vertical barriers such as curbs, piers, and walls;
- identify, supply, and erect local containment in accordance with applicable project specifications for ventilation and containment;
- provide all replacement filters, gaskets, and hand tools, as needed; and
- meet the requirements of 10 CFR 835 (Radiological Control).

The application of the Centrifugal Shot Blasting Technology will be performed in accordance with applicable D&D strategies developed for the OU3 Final Remedial Action, which are described in the OU3 Integrated RD/RA Work Plan. Specifically noted elements of the planning/design strategies for this demonstration are the incorporation of applicable performance specifications, including: (1) Debris/Waste Handling Criteria; (2) Removing/Fixing Radiological Contamination; and (3) Ventilation and Containment; and (4) Decontamination of Tools, Equipment, and Materials, into project plans. Health and Safety requirements are specified in a project Health & Safety Plan and Matrix, and radiological protection requirements will be specified in the Radiological Work Permit (RWP) that will be prepared shortly before activity begins.

2.3 Waste Management

Waste collection, handling, and management will be done in accordance with applicable provisions of the performance specification — Debris/Waste Handling Criteria, which has been incorporated into the project-specific Waste Management Plan. The performance specification — Debris/Waste Handling Criteria — is substantively identical to Specification O1120 included in Appendix B of the OU3 Integrated RD/RA Work Plan.

Waste estimates for this technology demonstration are listed below (category letter designations refer to the OU3 debris categories introduced in Table 2-2 of the OU3 Integrated RD/RA Work Plan):

- Category E (Concrete) = ~~96-142~~ cu. ft. (unbulked); ~~444-142~~ cu. ft. (bulked)
- Category I (Misc.) = ~~296-85~~ cu. ft. (unbulked); ~~740-128~~ cu. ft. (bulked)

Removed concrete will be collected in standard 55-gallon metal drums. Due to the weight

000010

removed from the list of potential suppliers due to either their inability to demonstrate experience with nuclear environments or their inability to meet the dust and waste collection criteria.

4.0 PROJECT SCHEDULE AND REPORTING

Based on initial performance estimates, which do not include an agreed upon schedule from the prospective technology demonstration subcontractor, the anticipated duration for this demonstration is two months. This period of time includes preparatory actions, mobilization, execution, and demobilization. The current target start and finish dates for this period are ~~April 13 - July 12~~ **June 1 - August 1**, 1998.

Within 60 days following the completion of the field demonstration, a project completion report will be prepared and submitted to the U.S. Environmental Protection Agency (U.S. EPA) and Ohio EPA which summarizes the results of the concrete removal demonstration as it relates to the OU3 final remedial action requirements. A statement will be included in the report which identifies the areal footage, depth, and waste volume of concrete removed. That information will be compared to the quantity of surface concrete required by the OU3 ROD. Should the demonstration prove to be successful in effectively removing surface concrete, this technology will be added to the list of approved methods in the D&D performance specifications for surface removal of concrete.

E 1419

This page left intentionally blank.