Department of Energy

Ohio Field Office
Fernald Closure Project
175 Tri-County Parkway
Springdale, Ohio 45246
(513) 648-3155

APR 25 2005

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

DOE-0226-05

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

RESPONSE TO COMMENTS FOR THE OPERABLE UNIT 4 COMPLEX SILOS 1&2 COMPONENTS 34A (SILO 2), 34b (SILO 1) AND SILOS 1&2 BRIDGES IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT

Reference: Letter, J. A. Saric to J. W. J. Reising, " Re: OU4 Silo 1 and 2 Implementation Plan," dated April 13, 2005

In response to the referenced letter, the United States Environmental Protection Agency's (US EPA) comments relating to the Operable Unit 4 (OU4) Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges Implementation Plan for Above-Grade Decontamination and Dismantlement (D&D) have been addressed. As requested by the Ohio Environmental Protection Agency, Appendix H titled "Fenceline Particulate Impact of Silos 1&2 D&D" has been added to the implementation plan. The Silos 1&2 Demolition ALARA and Air Sampling Plan, SD-2011, (attachment 1) is included as supporting documentation to the Implementation Plan.

This letter transmits the response to comments along with the OU4 Complex Silos 1&2 Implementation Plan Page Change Notice 2 (PCN2). Please remove the existing implementation plan pages affected by this change and replace them with the enclosure.

If you have any questions or need further information, please contact Ed Skintik at (513) 246-1369.

Sincerely,

William J. Taylor
Director

FCP:Skintik

Enclosure: As Stated

cc: w/enclosures:
J. Reising, OH/FCP
E. Skintik, OH/FCP
G. Jablonowski, USEPA-V, SR-6J
T. Schneider, OEPA-Dayton (three copies of enclosure)
F. Bell, ATSDR
M. Cullerton, Tetra Tech
M. Shupe, HIS GeoTrans
R. Vandergrift, ODH
AR Coordinator, Fluor Fernald, Inc./MS78

w/o enclosures:
C. Carr, OH/FCP
K. Alkema, Fluor Fernald, Inc./MS01
B. Edmondson, Fluor Fernald, Inc./MS64
J. Fry, Fluor Fernald, Inc./MS64
F. Johnston, Fluor Fernald, Inc./MS52-5
C. Murphy, Fluor Fernald, Inc./MS01
P. O'Neill, Fluor Fernald, Inc./MS52-1
D. Sizemore, Fluor Fernald, Inc./MS02
ECDC Fluor Fernald Inc./MS52-7 Project Number 40900.2.1

OPERABLE UNIT 4 (OU4) COMPLEX SILOS 1 & 2 IMPLEMENTATION PLAN FERNALD CLOSURE PROJECT RESPONSE TO USEPA COMMENTS FOR THE COMPONENTS 34A (SILO 2), 34B (SILO 1), AND SILOS 1 & 2 BRIDGES ABOVE-GRADE D&D PLAN

GENERAL COMMENT

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Not applicable (NA) Page #: NA Line #: NA
Original General Comment #: 1
Comment: The plan describes decontamination and dismantlement (D&D) of above-grade components at Silos 1 and 2. The plan should be revised to reference other plans that will address the D&D of the concrete slabs and excavation and removal of the concrete slabs and contaminated soil within the Silo 1 and 2 footprint.

Response: Subsection 1.2, Paragraph 3 - The first sentence has been changed to read: "Requirements for above-grade and at-grade D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1), 22E (K-65 Trench), F34-4 (Decant Sump Tank), the Silos 1&2 Bridges and Silos 1&2 concrete slabs were developed using the performance specifications that were originally included in Appendix B of the OU3 Integrated RD/RA Work Plan."

The following text has been added as Subsection 1.2, Paragraph 4: "Excavation and removal of the underlying contaminated soil within the Silos 1&2 footprint will be addressed in the Fernald Closure Project Area 7 Support Areas Integrated Remedial Design Package that will be submitted in May 2005. Excavation of contaminated soil will start after all the D&D activities are completed in the Silos 1&2 footprint.

Subsection 3.1 – Under the "Above-Grade and At-Grade Dismantlement" heading, the second sentence has been changed to read: "Component 34A and the Component 34A concrete slab will be dismantled using a track-hoe mounted, hydraulic shear, backhoe and concrete processor.

Subsection 3.2 – Under the "Above-Grade and At-Grade Dismantlement" heading, the second sentence has been changed to read: "Component 34B and the Component 34B concrete slab will be dismantled using a track-hoe mounted, hydraulic shear, backhoe and concrete processor.

5922 **SPECIFIC COMMENTS**

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.2 Page #: 1 Line #: NA
Original Specific Comment #: 1
Comment: The text states that the Operable Unit 4 (OU4) components consist of Silo 1, Silo 2, the Silo 1 and 2 bridges, the K-65 Trench, and the Decant Sump Tank. All of these components should be shown and labeled in Figure 1-1.

Response: Figure 1 has been revised to identify the Silos 1&2 Bridges, the K-65 Trench and the Decant Sump Tank.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1.3 Pages #: 2 and 3 Line #: NA
Original Specific Comment #: 2
Comment: The text states that the plan contains five appendixes. The plan actually contains seven appendixes. The text should be revised to resolve this discrepancy. Also, the plan should be revised to discuss the contents of Appendix G.

Response: The first sentence of Subsection 1.3 has been changed to read: "This implementation plan is comprised of five sections and seven appendices." The following text has been added to the end of the second paragraph of Subsection 1.3: "Appendix G is a copy of the FCP document SD-2098, Rev. 1, titled "Silo 2 Residual Source Term and Radon Production Rate Determinations".

Commenting Organization: U.S. EPA Commentor: Saric
Figure #: 1-1 Page #: 4 Line #: NA
Original Specific Comment #: 3
Comment: Figure 1-1 should be revised to show and label the Silo 1 and 2 bridges, the K-65 Trench, and the Decant Sump Tank. Also, the figure should be revised to indicate the nature of Buildings 94A, 94B, 94C, 94D, 94E, 94G, 94R, and 94T.

Response: Figure 1 has been revised to identify the Silos 1&2 Bridges, the K-65 Trench and the Decant Sump Tank. Figure 1-1 labeling of Buildings 94A, 94B, 94C, 94D, 9E, 94G, 94R and 94T was done to provide a clear layout of the Silos area. Since D&D of these buildings will be covered in a future implementation plan, indicating the nature of these buildings is not necessary in this implementation plan.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2 Page #: 5 Line #: NA
Original Specific Comment #: 4
Comment: The text states that, if practical, the steel piping system of the K-65 Trench will be cleaned using high- pressure washwater within containment to meet On-Site Disposal Facility (OSDF) placement criteria. The text should be revised to state

whether these decontamination activities will take place within the Silo 1 and 2 footprint or at another location.

Response: Subsection 2.2, first paragraph - The last sentence has been changed to read: "If practical, the K-65 Trench steel piping system will be cleaned using high pressure washwater within containment at the Silo 1&2 footprint to meet OSDF placement criteria".

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2 Page #: 6 Line #: NA
Original Specific Comment #: 5
Comment: The text states that standard technology will be used to prevent or minimize generation of airborne contamination. The text should be revised to summarize the standard technology that will be used or to reference another document where this information is available.

Response: Description of the methods for control of airborne contamination is provided in Subsection 2.3.4. Therefore, no change is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.2 Page #: 6 Line #: NA
Original Specific Comment #: 6
Comment: The text states that the results of an asbestos-containing material (ACM) evaluation will be forthcoming. The text should be revised to state how potential ACM will be segregated from other debris and whether ACM will be disposed of in the OSDF or off site.

Response: Subsection 2.2 – The last paragraph has been changed to read: "The Silos 1&2 bridges, all piping and equipment within the Silos 1&2 bridges were evaluated by a State of Ohio–Certified Asbestos Hazard Evaluation Specialist for asbestos containing materials (ACM). Because of the age of construction, it was determined that no ACM exists in the Silos 1&2 bridges, on the piping within the Silos 1&2 bridges and within the Silos 1&2 bridges equipment. The Silos 1&2 concrete structures were not sampled for ACM since there was no surface accessibility (historically) due to the earthen berm. However, the Silos 3&4 concrete structures were sampled and no ACM was found in the mortar. Silos 1, 2, 3 & 4 were designed and constructed during the same time period and appear homogenous in nature. Therefore, no friable ACM should be present in the Silos 1&2 concrete structures."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.4 Page #: 9 Line #: NA
Original Specific Comment #: 7
Comment: The text states that a surface encapsulant will be applied to the sized concrete debris pile. The text should be revised to state what the surface encapsulant will consist of.

5922

Response: Subsection 2.3.4, second paragraph – The last sentence has been changed to read "Upon completion of the Component 34A (Silo 2) and 34B (Silo 1) concrete demolition, a surface encapsulant (Childers Chill Lock or equal – used previously in FCP D&D activities) will be applied using pressure spraying equipment to the sized concrete debris pile."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.4 Page #: 9 Line #: NA
Original Specific Comment #: 8
Comment: The text states that concrete debris will be transported northward for temporary staging at Soil Pile 7 (SP-7). The text should be revised to state how long the concrete debris is expected to be staged at SP-7. Additionally, the text should address management of storm water runoff from the staging area. Finally, the text should discuss the effective life of the surface encapsulant, as it is not clear how long the concrete debris will be staged at SP-7.

Response: By the end of June 2005, silos debris staged in SP-7 is expected to be loaded out. Loadout of the entire SP-7 is scheduled for completion by September 2005. This information is not included in the implementation plan.

Subsection 2.3.4, third paragraph – The following text has been added after the fourth sentence: "The runoff from the SP-7 area is controlled to drain to a storm sewer discharging to the site Stormwater Retention Basin. The encapsulant and soil blending will provide adequate mitigation of fugitive emissions during the storage period in SP-7."

Based on prior applications to transite panels that were staged and exposed to weather, a surface encapsulant effective life of one year can be expected. However, surface encapsulant effective life has not actually been measured at the Fernald Closure Project. Therefore no change has been made to this implementation plan. Encapsulated concrete debris will be visually monitored to ensure the effectiveness of the encapsulation. Should significant breakdown of the encapsulant occur, reapplication will be performed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.4 Page #: 9 Line #: NA
Original Specific Comment #: 9
Comment: The text states that debris that exceeds OSDF Waste Acceptance Criteria (WAC) will be evaluated to determine the appropriate off-site disposal destination. It is unclear whether debris that exceeds the OSDF WAC will remain in containers or taken to SP-7 for temporary staging. The text should be revised to explain exactly what will happen to debris that exceeds the OSDF WAC.

Response: Subsection 2.3.4, fifth paragraph – The following text has replaced the last sentence (as two sentences) to read: " The piping and structural steel is

expected to meet OSDF Waste Acceptance Criteria (WAC). Any material failing to meet OSDF WAC will be size reduced as required to meet Envirocare WAC and transported to SP-7 for staging pending shipment to Envirocare."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.4 Page #: 9 Line #: NA
Original Specific Comment #: 10
Comment: The text states that debris may be stockpiled if the number of containers available for the debris is limited. The text should be revised to state how long the debris may be stockpiled.

Response: The intended plan is to load debris within the Silos 1&2 footprint for direct transportation to the OSDF. Staging of material pending disposal in the OSDF is not anticipated and will only be necessary for a limited period of time (no longer than thirty days) as required by weather conditions or emptying containers to allow OSDF transport. Therefore, no change is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.3.4 Page #: 11 Line #: NA
Original Specific Comment #: 11
Comment: The text states that steel piping from the K-65 Trench that exceeds the OSDF WAC will be disposed of at Envirocare or another off-site disposal facility. The text should be revised to state where K-65 Trench piping will be staged if it exceeds the OSDF WAC.

Response: Subsection 2.3.4, last paragraph – The following text has been added as the last sentence to this paragraph: "Debris that fails to meet OSDF WAC will be staged at SP-7 pending offsite shipment."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4 Page #: 12 Line #: NA
Original Specific Comment #: 12
Comment: The text states that environmental monitoring will include supplemental radiological air monitoring and wastewater monitoring. The text should be revised to describe how dust emissions will be monitored and controlled.

Response: Dust emissions will be controlled as described in Subsection 2.3.4.

Subsection 2.4, the fourth paragraph under the "Radiological Air Monitoring" heading has been changed to read: "Fernald Closure document SD-2011, Silos 1&2 Demolition ALARA and Air Sampling Plan was developed by Silos Radiological Engineering to address isotopes of concern, sampling methods, placement and analysis for the protection of personnel working in or adjacent to the described activities. Also, this document provides detail with respect to source terms, area and personnel monitoring, engineering/administrative controls and response to abnormal/unexpected air sampling results."

5922

A copy of SD-2011 is included with this comment response package as Attachment 1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.4 Page #: 13 Line #: NA
Original Specific Comment #: 13
Comment: The text states that Silos Radiological Engineering will develop, modify, and implement an air sampling plan. The text should be revised to state whether the air sampling plan has been completed and to include a reference for the plan.

Response: Subsection 2.4, the fourth paragraph under the "Radiological Air Monitoring" heading has been changed to read: "Fernald Closure document SD-2011, Silos 1&2 Demolition ALARA and Air Sampling Plan was developed by Silos Radiological Engineering to address isotopes of concern, sampling methods, placement and analysis for the protection of personnel working in or adjacent to the described activities. Also, this document provides detail with respect to source terms, area and personnel monitoring, engineering/administrative controls and response to abnormal/unexpected air sampling results."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.4 Page #: 21 Line #: NA
Original Specific Comment #: 14
Comment: The text discusses preparation of the base concrete slabs during demobilization. The text should be revised to state whether the base concrete slabs will be covered with soil that exceeds the OSDF WAC. The possibility was discussed during a recent telephone conference call attended by the U.S. Department of Energy, Ohio Environmental Protection Agency, and U.S. Environmental Protection Agency.

Response: After further evaluations, DOE has decided not to use above-WAC soil for covering the Silos 1&2 slabs.

Subsection 2.5.4, last paragraph under the "Concrete Removal" heading – The following text has been added as the third and fourth sentences: "If the slabs cannot be excavated directly after above grade D&D activities, the remaining below-WAC Silos 1&2 berm soil will be used to cover the slabs. Prior to below-WAC soil placement, the slabs will be covered with a geotextile material to prevent contact between the below-WAC soil and the existing slab."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 2.5.4 Page #: 21 Line #: NA
Original Specific Comment #: 15
Comment: The text states that the silo slab at grade will be covered with soil after demolition of the superstructure. According to the drawings included in Appendix D, the silos bottom slab is sloped toward a sump. The text does not address accumulation of storm water on top of this slab or how this water will

be controlled so that it does not overflow the slab at its perimeter. The text should be revised to address this issue.

Response: The sump in the floors of Silo 1&2 was filled during the grouting operation that followed waste retrieval. Drainage from the slabs and surrounding area is collected by the silo perimeter trench that drains to the site stormwater system. Therefore, no change is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3.4 Page #: 29 Line #: NA
Original Specific Comment #: 16
Comment: The text discusses the concrete trench and steel piping system of the K-65 Trench. The K-65 Trench and its components should be shown and labeled in Figure 1-1.

Response: Figure 1 has been revised to identify the K-65 Trench.

Attachment 1 5922

SUPPORTING DOCUMENT	DOCUMENT NO: SD-2011	Effective Date: 03/23/05
FERNALD CLOSURE PROJECT ESH&Q SAFETY AND HEALTH Silos Radiological Engineering/Control	Silos 1 & 2 Demolition ALARA and Air Sampling Plan ☐ POSITION PAPER ■ TECHNICAL BASIS AUTHOR: J. L. Barber	Revision No: 0
	Approval: *ON FILE* Date 3/23/05 J. Barber, CHP, Silos Radiological Engineering/Control Manager Approval: *ON FILE* Date 3/23/05 Stan Waligora Jr., CHP, ALARA Chairperson Approval: *ON FILE* Date 3/23/05 Dan Thiel, Site Radiological Control Manager	

Supersedes - None

SUMMARY LOG

Revision Number	Effective Date	Description of Revision	Pages effected
0	03/23/2005	Initial issuance	All

TABLE OF CONTENTS

Attachment 1

1.0 SCOPE

Silos Radiological Engineering has evaluated the radiological conditions and potential effects from the demolition of Silos 1 & 2 concrete structures and steel bridges used in the Accelerated Waste Retrieval project. This document describes the analysis methods and results, and is applicable only to the demolition of Silos 1&2.

2.0 INTRODUCTION

At the completion of the AWR project, the Silos Engineering group performed a series of evaluations, calculating the residual source terms (radiological constituents) for both Silo 1 and 2. These evaluations are documented in *SD-2095 Silo 1 Residual Source Term and Radon Production Rate Determinations* and *SD-2098 Silo 2 Residual Source Term and Radon Production Rate Determinations.*

Prior to the actual demolition phases addressed in this document, preparation work including berm removal, component flushing and equipment extraction is being conducted under air sampling and personnel exposure controls as specified in existing AWR RWP's. and plans.

3.0 DEMOLITION ACTIVITIES

Demolition activities:

- Rig and torch-cut the Silo 1 east and west stair tower sheet piling at grade.
- Size reduce and containerize the sheet piling.
- Transport the resulting debris to the OSDF for placement.
- Establish Silo 1 dust suppression, air monitoring and radiological/construction boundaries.
- Demolish the Silo 1 concrete walls and dome utilizing a track hoe with concrete processor attachment.
- Transport the Silo 1 sized concrete wall and dome debris to Soil Pile 7 (SP-7).
- Cover the remaining grout and at-grade slab with soil. Note: The Silo 1 grout and at-grade slab will remain in place until excavation of all waste pit material is complete and until sufficient gondola cars with lids are available for sized concrete debris shipment.
- Remove the Silo 1 grout, segregate and containerize the weir boxes.
- Transport the Silo 1 grout and weir boxes to SP-7, blend with soil and load into rail cars.
- Demolish Silo 1 at grade slab, transport the Silo 1 at-grade slab sized debris to SP-7, blend with soil and load into rail cars.
- Remove, inspect, wash (if necessary) and containerize the Decant Sump discharge line attached to Silo 1 bridge steel.
- Remove all piping, conduit and structural steel from the Silo 1 east stair tower north to the common Silo 1&2 bridge support tower.
- Demolish the Silo 1 Bridge by pulling the bridge south.
- Shear and load-out all bridge steel and equipment, segregate plate steel requiring torch cutting to an adjacent location and torch-cut/load-out.
- Rig and cut the common east to west bridge steel and piping between the common Silo 1&2 bridge support tower east to the location of system air gaps.

- Transport the resulting debris to the OSDF for placement.
- Cut visual inspection access for WAO in the isolated Silo 2 slurry and sluice piping and RCS ducting as directed by WAO.
- Rig and torch-cut the Silo 2 east and west stair tower sheet piling at grade.
- Size-reduce and containerize the sheet piling.
- Transport the resulting debris to the OSDF for placement.
- Establish Silo 2 dust suppression, air monitoring and radiological/construction boundaries.
- Demolish the Silo 2 concrete walls and dome utilizing a track hoe with concrete processor attachment.
- Transport the Silo 2 sized concrete wall and dome debris to Soil Pile 7 (SP-7).
- Cover the remaining grout and at-grade slab with soil. Note: The Silo 2 grout and at-grade slab will remain in place until excavation of all waste pit material is complete and until sufficient gondola cars with lids are available for sized concrete debris shipment.
- Remove the Silo 2 grout, segregate and containerize weir boxes.
- Transport the Silo 2 grout and weir boxes to SP-7, blend with soil and load into rail cars.
- Demolish Silo 2 at grade slab, transport the Silo 2 at-grade slab sized debris to SP-7, blend with soil and load into rail cars.
- Remove all the piping, conduit and structural steel from the Silo 2 east stair tower south up to and including the common Silo 1&2 bridge support tower.
- Demolish the Silo 2 Bridge by pulling the bridge south.
- Shear and load-out all the bridge steel and equipment, segregate plate steel requiring torch cutting to an adjacent location and torch-cut/load-out.
- As necessary, excavate to expose the Decant Sump structure.
- Demolish the Decant Sump structure, load-out debris to SP-7 and blend with soil.
- The K-65 Trench pipe (remaining Component 22E) and any piping beneath the silo slabs will be removed, size-reduced, visually inspected by WAO and dispositioned per WAO direction.

Waste Handling

Component 34A and 34B (Silo 1&2) sized concrete debris generated during the D&D, will be wetted down and loaded into articulating dump trucks. The articulating dump trucks will be located on the roadway just to the west of Component 34A and 34B. Tarps will be placed over each truckload to further minimize dust. The debris will be transported north for temporary staging at SP-7. From SP-7, the sized concrete debris will be wetted down and loaded into covered gondola cars. The waste packaging activity will involve placing a soil layer in the base of each gondola car, followed by placement of silos concrete debris and covered with the final soil layer.

4.0 POTENTIAL SOURCE OF AIRBORNE RADIOACTIVE MATERIAL, ISOTOPES OF CONCERN AND MONITORING

Controlling the spread of contamination is key in the prevention of the generation of airborne radioactivity. Contamination is expected to be partially available for suspension in air, from Silos 1&2 interiors.

Grouting operations were conducted and monitoring data indicates a high percentage of the residual radioactive material is covered on the flooring however, the interiors side will have residual surface contamination, and based on the nature of the work could become airborne.

Particulate air samplers will be positioned on or around the Silos areas and the TTA building. These air samples will be counted for gross alpha activity, after a seven day decay period. The activity will be assessed against the effective K-65 DAC of 2 E-11 uCi/ml (Reference 40700_RAD-0004 Silos 1 and 2 Material Effective Derived Air Concentration, Fluor Fernald; dated March 2000.)

Radon gas (CRM) and working level monitors will be placed inside the work area and along the perimeter of the project area to measure radon and associated daughter concentrations. Radon emanation from the residual material is also expected to be on the order of 2.72 E+07 pCi/min for Silo 1 and 2.54 E+07 pCi/min for Silo 2. These expected source terms will reduce as material is loaded out and removed from the area.

5.0 ADMINISTRATIVE CONTROLS

- Airborne Radioactivity Areas will be established around the project area in conjunction with Contamination Area boundaries.

- Airborne radioactivity monitoring will be performed to assess airborne radioactivity concentrations for radon, short lived radon progeny, and long lived particulate daughters.

- Contamination Areas will be established such that the area is minimized and provisions are made for a step-off pad and an area for doffing contaminated PPE.

- Radiological Work Permits will be provided for all activities to be conducted in Radiological Areas (ARA's, RA's, and CA's) and required for entry, specifying RCT coverage, area and personnel monitoring, work controls and PPE requirements.

- Doffing areas will be provided for personnel exiting the radiological areas.

6.0 DESCRIPTION OF AIR MONITORING EQUIPMENT AND SAMPLE ANALYSIS FOR GENERAL WORK AREAS

Four stationary position Continuous Radon Monitors (CRM) operated for the Environmental Group will remain in place as long as possible, monitoring the KNE, KNW, KSE and KSW locations around the silos for radon gas concentrations.

Two fixed position alpha NUCLEAR Continuous Working Level Monitor monitors will be used to assess radon working level concentrations toward the northern adjacent Silo 3 project in conjunction with particulate air sampler locations.

Five fixed location particulate air samplers will be placed at project perimeter areas.

Additional radon working level monitoring will be conducted within the work area, based on RWP specifications, through use of battery powered, portable working level instruments.

Personal Air Sampling will be conducted for workers entering the area, in accordance with the RWP specifications.

Perimeter monitoring data will be reviewed to ensure occupied areas immediately surrounding these work areas do not exceed a long term 2% concentration of the applicable DAC. Areas that are below posting thresholds but are in excess of 2% may potentially require Personnel Air Sampling devices to serve for bioassay needs. For the isotopes of concern, slow clearance makes urinalysis ineffective. Long term exposure (2000 hrs) could result in excess of 100 mrem internal exposure.

7.0 RESPONSE TO SUSPECT AIRBORNE RADIOACTIVITY CONCENTRATIONS

If a single air sample result is greater than or equal to 1 DAC in an unposted area or if radon working levels exceed 0.3 WL for a daily average:

- Non-critical work activities will be stopped.
- Notify the D&D Project Manager, Silos Radiological Engineering/Control Manager, AEDO and Site Radiological Control Manager
- Radiological boundaries will be established for the effected area and posted as an ARA.
- Evaluations of adjacent and/or adjoining areas will be initiated.

If a single air sample result > 30% DAC but less than the assigned effective DAC or if radon working levels exceed 0.09 WL for a daily average in an un-posted area:

- Promptly take action to limit or mitigate personnel exposures (e.g., prevent or limit occupancy, prescribe respiratory protection, etc.) in the area;
- Evaluate air monitor placement;
- Notify the D&D Project Manager, Silos Radiological Engineering/Control Manager, AEDO and Site Radiological Control Manager ;
- Evaluate prior sampling data for the potential to exceed 12 DAC-hrs in one week (this will require an evaluation of radon concentrations and long lived particulate concentrations combined).

Attachment 1

If weekly particulate air sampling results average greater than 2% of the effective DAC in an unposted area or if radon working levels exceed 0.03 WL on a weekly average (1.2 WL-hrs per week);

- Notify the Site Radiological Control Manager.
- Notify Internal Dosimetry for bioassay determinations.

NOTE: The above actions are not intended to establish sequential criteria and may not be all-inclusive. Responsible project personnel such as the Radiological Engineering/Control Manager or Radiological Engineer are most likely to be the first persons to recognize the above conditions (from air sampling data) and should initiate the process prioritizing the actions dictated by the severity of potential worker exposure.

For example: If air monitoring data indicates concentrations posing a significant potential for worker exposure and one, or all, of the persons to be notified are not available, non critical work should still be stopped and/or exposure mitigation techniques (respiratory protection) implemented.

8.0 EXTERNAL ALARA DOSE PROJECTIONS

Silos Radiological Engineering/Control performed Microshield calculations, using radon concentrations derived from prior calculations and contact dose rates were found to be on the order of .25 to .3 mrem/hr. (Copy attached)

On Friday, 03/18/05, Radiological Engineering and a Lead RCT performed contact dose rate measurements with the GR-135 Exploranium instrument on the exposed Silos 1&2 side walls. The silos berms have been excavated to grade.

Dose rates were verified to range from .25-.30 mrem/hr at contact (1") and averaged .050-.080 at ten feet. Using the measurements and personnel manhour projections supplied by the demolition group, cumulative dose projections for the demolition project are expected to be approximately 160 person millirem.

800 person hrs for Bridge D&D at .10 mrem/hr = 80 person mrem
600 person hrs for concrete D&D at .10 mrem/hr – 60 person mrem
320 person hrs for drivers moving waste at .05 mrem/hr = 16 person mrem

Based on this analysis a formal ALARA Committee review is not required.

OPERABLE UNIT FOUR COMPLEX SILOS 1&2 COMPONENTS 34A (SILO 2), 34B (SILO 1) AND SILOS 1&2 BRIDGES IMPLEMENTATION PLAN

DOCUMENT NUMBER 40900-PL-0003 (REV. 0) PCN2

PAGE CHANGES

INCLUDES:

COVER PAGE/RECORD OF REVISION

TABLE OF CONTENTS PAGE i/ii

PAGE 1/2
PAGE 3/4
PAGE 5/6
PAGE 7/8
PAGE 9/10
PAGE 11/12
PAGE 13/14
PAGE 21/22
PAGE 23/24
PAGE 25/26
PAGE 27/28
PAGE 33/34

NEW PAGES

INCLUDES:

APPENDIX H – COVER PAGE
APPENDIX H - PAGE 1/2

OPERABLE UNIT 3

OPERABLE UNIT 4 (OU4) COMPLEX SILOS 1&2 COMPONENTS 34A (SILO 2), 34B (SILO 1) AND SILOS 1&2 BRIDGES IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT

APRIL 2005

FERNALD CLOSURE PROJECT
FERNALD, OHIO

U. S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

FINAL

DOCUMENT CONTROL NO. 40900-PL-0003 (REV. 0) PCN2

5922

RECORD OF ISSUE/REVISION

DATE	REVISION NO.	DESCRIPTION AND AUTHORITY
3/16/05	Rev. 0	Issued Final Implementation Plan
3/29/05	PCN1	Section 2.6, "Phase 4 D&D Activities" - inserted text inadvertently omitted to address demolition of the Silo 2 concrete structure (ten bullets starting at the top of Page 24).
4/14/05	PCN2	Per USEPA comments, changes incorporated into Figure 1-1, and Subsections 1.2, 1.3, 2.2, 2.3.4, 2.4, 2.5.4, 3.1 and 3.2. Per OEPA, added Appendix H, titled "Fenceline Particulate Impact of Silos 1&2 D&D". Changes and additions are identified as "PCN2" or Page Change Notice 2.

5922

OU4 COMPLEX SILOS 1 & 2
COMPONENTS 34A (SILO 2), 34B (SILO 1) AND
SILOS 1&2 BRIDGES
IMPLEMENTATION PLAN FOR ABOVE-GRADE
DECONTAMINATION AND DISMANTLEMENT

TABLE OF CONTENTS

5922

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

PCI

5922

1.0 INTRODUCTION

1.1 Project Statement

This implementation plan represents the sole remedial design deliverable developed for the Operable Unit 4 (OU4) Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges decontamination and dismantlement (D&D) project, which has been prepared for regulatory agency approval pursuant to the Operable Unit 3 (OU3) Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997). This document presents a summary of the remedial design documentation prepared for the D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges from the OU4 Complex. This D&D project is being implemented pursuant to the authority stipulated in the OU3 Record of Decision for Final Remedial Action (OU3 Final ROD) (DOE 1996a), which covers D&D, waste treatment, and disposition.

The purpose of this document is to summarize the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D design in the format and content stipulated by the OU3 Integrated RD/RA Work Plan and established by previously approved D&D implementation plans. This document elaborates, as applicable, on programmatic strategies developed for the Fluor Fernald self-perform D&D scope of work and project specifications (contained in Appendix C of this document).

1.2 Scope of Work

The OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project includes the following major activities:

- preparatory action/facility shutdown
- surface decontamination;
- berm removal;
- above-grade component dismantlement;
- at-grade Component 34A and 34B dismantlement;
- environmental monitoring; and
- material management.

Preparatory action: Inventory Removal and Safe Shutdown are not in the scope of this D&D project; however, Facility Shutdown shall be performed and pertinent information has been summarized in Sections 2 and 3. The following components are included in the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project:

- Component 34A – K-65 Storage Tank (Silo 2)
- Component 34B – K-65 Storage Tank (Silo 1)
- G-008 – Silos 1&2 Bridges

5922

- Component 22E – K-65 Trench
- Component F34-4 – Decant Sump Tank

Requirements for above-grade and at-grade D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1), 22E (K-65 Trench), F34-4 (Decant Sump Tank), the Silos 1&2 Bridges and Silos 1&2 concrete slabs were developed using the performance specifications that were originally included in Appendix B of the OU3 Integrated RD/RA Work Plan. Appendix C of this Implementation Plan contains project-specific applications of these performance specifications that incorporate process improvements and lessons-learned from previous D&D projects at the Fernald Closure Project (FCP). PC

Excavation and removal of the underlying contaminated soil within the Silos 1&2 footprint will be addressed in the Fernald Closure Project Area 7 Support Areas Integrated Remedial Design Package (DOE 2005a) that will be submitted in May 2005. Excavation of contaminated soil will start after all the D&D activities are completed in the Silos 1&2 footprint. PC

Department of Energy (DOE) will provide notification to the regulatory agencies of any significant changes to the design prior to implementation. Should the regulatory agencies have any concerns regarding any significant design change, DOE will properly address those concerns as soon as practicable and, if necessary, perform one or more of the following: amend the implementation plan, amend the OU3 Integrated RD/RA Work Plan, present an explanation of significant difference to the OU3 ROD, and/or amend the RODs. Significant changes to the design are those that require formal design modification that would impact the implementation strategies presented in this document. If necessary, affected activities may be suspended until the revision has been completed and approved. This course of action adheres to the commitments made in Section 4.2.2 of the OU3 Integrated RD/RA Work Plan for design changes.

1.3 Plan Organization

This implementation plan is comprised of five sections and eight appendices. Section 1 contains the remedial action project statement, scope of work, an overview of this implementation plan, and a brief description of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges. Section 2 describes the overall approach to implementing this above-grade D&D project, as applied from the OU3 Integrated RD/RA Work Plan. That approach includes the projected sequence for remediation of structures, a plan for materials management, environmental monitoring activities, and the project-specific applications of implementation strategies for above-grade remediation. Section 3 presents pertinent building/component history and applicable building/component-specific details of the applicable remedial tasks. Section 4 presents the schedule for remediation and project reporting. Section 5 describes the Fluor Fernald self-perform D&D strategy and FCP project management approach. PC

Appendix A contains a discussion of potential environmental and occupational sampling for this project, based on the assumptions in the Sampling and Analysis Plan (SAP) contained in Appendix D of the OU3 Integrated RD/RA Work Plan, and on the remediation requirements presented in this plan. Appendix B provides a summary of the evaluation of material disposition alternatives for accessible metals and a tabulation of the cost comparison between the disposition alternatives. Appendix C provides the project performance specifications. Appendix D provides copies of available drawings and sketches that show floor plans and elevations of buildings/components. Appendix E contains selected photographs of notable features of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges. Appendix F is a copy of the FCP document SD-2095, Rev. 1, titled "Silo 1 Residual Source Term and Radon Production Rate Determinations". Appendix G is a copy of the FCP document SD-2098, Rev. 1, titled "Silo 2 Residual Source Term and Radon Production Rate Determinations". **PCN2** Appendix H is a two-page document titled "Fenceline Particulate Impact of Silos 1&2 D&D". **PCN2**

1.4 Location of Silos 1&2 Components 34A, 34B and Silos 1&2 Bridges

The Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges project area is located at the U.S. Department of Energy (DOE) Fernald Closure Project (FCP) in Fernald, Ohio. Project components include Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges located north of Silo Road and south of the Biodenitrification Surge Lagoon within the southwestern-most block of the former Production Area. The Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges project area is illustrated in Figure 1-1.

5922

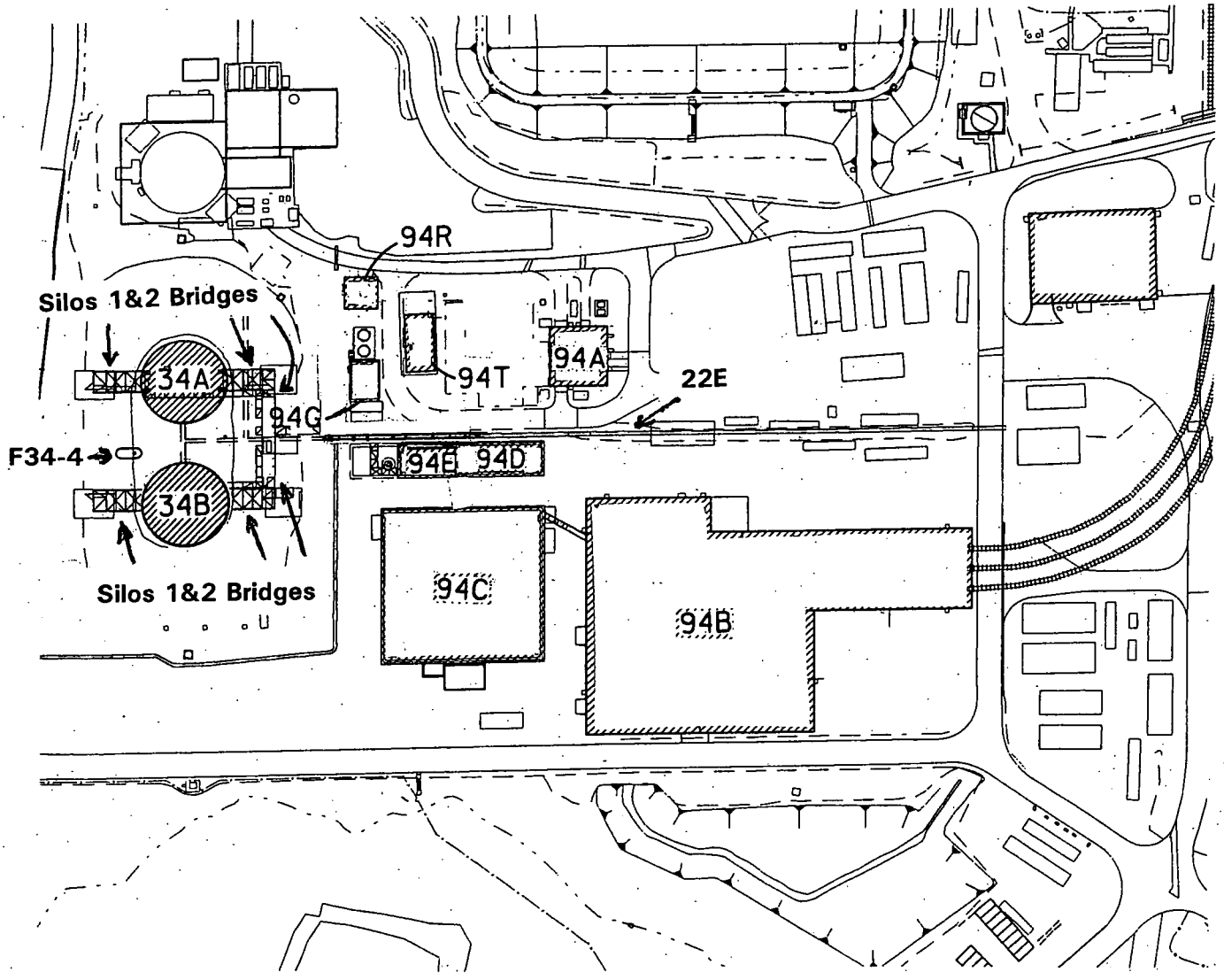

FIGURE 1-1 Components 34A, 34B and Silos 1&2 Bridges PCN2

5922

2.0 GENERAL PROJECT REMEDIATION APPROACH

The overall approach to the above-grade D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges is based on the project-specific applications of the programmatic elements and tasks that were described in Section 3 of the OU3 Integrated RD/RA Work Plan. Section 2 of the implementation plan summarizes the project-specific applications of those elements.

2.1 Sequencing of Remediation

The remediation sequence for components in the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project covers the period of: 1) premobilization, which includes the preparation, review and approval of the Fluor Fernald self-perform work control documents, health and safety documents, etc; 2) mobilization, which includes establishing project support facilities and controls; 3) actual D&D field activities for each component; and 4) demobilization, which includes securing the area and decontaminating/removing Fluor Fernald self-perform equipment. The actual sequence of component D&D will be determined by the Fluor Fernald self-perform project schedule which includes the operational sequence for shutdown of facilities. It is anticipated that the sequence for dismantlement may be the following:

1. Component 34B – K-65 Storage Tank (Silo 1)
2. Component G-008 – Silo 1 Bridge
3. Component 34A – K-65 Storage Tank (Silo 2)
4. Component G-008 - Silo 2 Bridge
5. Component F34-4 – Decant Sump Tank
6. Component 22E – K-65 Trench

2.2 Characterization of Silos 1&2 Components 34A, 34B and Silos 1&2 Bridges

Based on knowledge from previous remediation activities associated with Component 22E (K-65 Trench) in the Silos 1&2 area, elevated concentrations of Technetium-99 may exist in the remaining trench. If Technetium-99 is found to exist, the remaining K-65 Trench gravel backfill will be removed and disposed offsite. If practical, the K-65 Trench steel piping system will be cleaned using high pressure washwater within containment at the Silo 1&2 footprint to meet OSDF placement criteria. **PCN2**

D&D debris that has come in direct contact with the Silos 1&2 material will be evaluated for disposition in accordance with the criteria outlined in Section 3.3.1 of the OU3 Integrated RD/RA Work Plan.

D&D debris that has not come in direct contact with Silos 1&2 material (ex: structural steel, and non-process pipe & equipment) will be evaluated for disposition in accordance with the

criteria outlined in Section 3.3.1 of the OU3 Integrated RD/RA Work Plan. Changing radiological conditions could alter the waste disposition of this D&D debris.

The most significant radiological concerns are the health and safety of the workers during dismantlement of Silos 1&2 (Component 34A & 34B). Component 34A and 34B are known to have residual Radium-226 contamination. Standard technology will be used to prevent or minimize generation of airborne contamination.

Specific uses of the radiological survey data to be obtained prior to the D&D activities will support the following efforts:

- Developing the safety assessment documentation to support the proposed activities.
- Enhancing the project-specific health and safety requirements and determining potential concerns for worker protection based on the suggested D&D techniques.
- Documenting expected contamination levels for self-performing the work.
- Determining personnel monitoring requirements.
- Identifying specific systems or equipment that will require radiological engineered controls prior to dismantlement.
- Air modeling for and assessment of potential radiological air emissions.
- Identifying potential gross radiological contamination that will need to be removed/fixed prior to exposing affected material surfaces to the environment.

The Silos 1&2 bridges, all piping and equipment within the Silos 1&2 bridges were evaluated by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist for asbestos containing materials (ACM). Because of the age of construction, it was determined that no ACM exists in the Silos 1&2 bridges, on the piping within the Silos 1&2 bridges and within the Silos 1&2 bridges equipment. The Silos 1&2 concrete structures were not sampled for ACM since there was no surface accessibility (historically) due to the earthen berm. However, the Silos 3&4 concrete structures were sampled and no ACM was found in the mortar. Silos 1, 2, 3 & 4 were designed and conctructed during the same time period and appear homogenous in nature. Therefore, no friable ACM should be present in the Silos 1&2 concrete structures. PC

2.3 Materials Management

Project-specific material management strategies for the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project are based on the overall material management strategies that were presented in Section 3.3 of the OU3 Integrated RD/RA Work Plan and the project-specific requirements presented in Specification Section 01120. Management of primary and secondary waste materials estimated to be generated during the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project is discussed in this section.

Waste minimization will be accomplished, in part, by ensuring that equipment and material are unpacked prior to entering the FCP controlled area whenever possible. This administrative control will limit the amount of trash that could become contaminated and limit quantities of any hazardous material brought into the project area.

2.3.1 Primary Materials Management

Primary materials refer to the debris that will be generated by the dismantlement of the Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges. During the remedial design, a Project Waste Identification and Disposition form (PWID — see Section 3.3.1 of the OU3 Integrated RD/RA Work Plan for description) was developed which identifies all debris to be generated along with quantities, characterization, container requirements, and disposition location. In support of the PWID, each waste stream has been characterized and documented in a Material Evaluation Form (MEF) or an OSDF profile. In order to provide the sizing, segregation, and containerization requirements outlined in the OU3 Integrated RD/RA Work Plan, a Material Segregation and Containerization Criteria form (MSCC — see Section 3.3.1 and Appendix A of the work plan for description and example, respectively) was developed.

Pursuant to DOE's commitment to evaluating potential opportunities for recycle/reuse, as described in Section 3.3.6.1 of the OU3 Integrated RD/RA Work Plan, an evaluation of material disposition alternatives for accessible metals was performed and a summary of the results is presented in Appendix B.

Specification Section 01120 identifies debris/waste-handling requirements. Debris handling requirements are defined by the following classifications: 1) non-process debris; 2) process debris and 3) suspect process debris. Details regarding the handling of each of these types of debris are described in Article 3.2 of Specification Section 01120. All debris is required to be sized, segregated, and containerized in accordance with MSCC. To ensure debris that is destined for disposal in the OSDF meets the OSDF waste acceptance criteria (WAC), the MSCC identifies specific materials from the project that are known to either meet or not meet the OSDF WAC. When debris is generated, a representative from the Waste Acceptance Organization will be present to ensure that debris is segregated according to the proper categories identified on the MSCC.

2.3.2 Secondary Waste Management

Management of secondary wastes includes handling, sampling, storage and disposition of secondary waste materials generated during remediation. Secondary waste includes vacuumed particulate, filters, personal protective equipment (PPE), spent consumables and washwaters.

Depending on the DOE-approved methods for equipment/systems dismantlement, it is possible that up to 10,000 gallons of decontamination washwaters may be generated during the D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges and the Fluor

Fernald self-perform equipment. This wastewater may have to be pre-treated prior to discharge to the AWWT. Wastewater handling includes sampling and analysis of water and sludges for constituents of concern (see Section 2.4 for wastewater monitoring), discharge of approved effluent into the FCP wastewater treatment system (Advanced Wastewater Treatment Facility) and sludge removal. The need for washwater sampling is determined by the Wastewater Treatment System (WWTS) Manager if significant levels of constituents of concern are present, based on an assessment of relevant OU3 Remedial Investigation and Feasibility Study (RI/FS) (DOE 1993a) analytical data and process history. Section 2.4 further discusses wastewater monitoring strategies. The ultimate disposition of wastewater into the WWTS is managed in accordance with existing site procedure EP-005 "Controlling Aqueous Wastewater Discharges into Wastewater Treatment Systems".

The method of pre-treat for the Components 34A (Silo 2) and 34B (Silo 1) will be determined as a result of the concrete core sampling. Decontamination water used on the Silo 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges will be collected in onsite storage tanks with secondary containment and sampled prior to discharge to the AWWT. Bridge piping will be moved to a location where a containment can be established and decontamination performed using a high pressure washer. After a reasonable effort is made, if the piping is unable to meet WAO inspection criteria, it will be placed in railcars for shipment to Envirocare.

2.3.3 Estimates of Material Volumes

Materials to be generated during this project have been categorized using the same classification system that was developed for and described in the OU3 RI/FS and OU3 Integrated RD/RA Work Plan, and are estimated in Tables 2-1, 2-2, and 2-3.

2.3.4 Material Handling, Storage, Treatment, and Disposition

Materials generated from the D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges will be reduced in size, segregated, and containerized in accordance with the requirements identified in the MSCC form. Quantities and disposition of specific material categories were documented in the PWID form for internal use. Tables 2-1, 2-2, and 2-3 summarize the MSCC and PWID by identifying quantities, containerization, staging/interim storage, and disposal requirements for each category of material. Debris size requirements are described in Sections 3.3.2.1 and 3.3.6.2 of the OU3 Integrated RD/RA Work Plan.

The Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project will employ methods of dust suppression that will maximize atomization of the water while minimizing the amount of water generated. A surfactant may be utilized during dust suppression to help maximize efficiency of the dust suppression. Upon completion of the Component 34A (Silo 2) and 34B (Silo 1) concrete demolition, a surface encapsulant (Childers Chill Lock or equal – used previously in FCP D&D activities) will be applied using pressure spraying equipment to the sized concrete debris pile. PCI

Component 34A and 34B sized concrete debris generated during the D&D Phases 2 & 4 (identified in Section 2.6) will be wetted down and loaded into articulating dump trucks. The articulating dump trucks will be located on the roadway just to the west of Component 34A and 34B. Tarps will be placed over each truckload to further minimize dust. The debris will be transported north for temporary staging at Soil Pile 7 (SP-7). The runoff from the SP-7 area is **PCN2** controlled to drain to a storm sewer discharging to the site Stormwater Retention Basin. The encapsulant and soil blending will provide adequate mitigation of fugitive emissions during the storage period in SP-7. From SP-7, the sized concrete debris will be wetted down and loaded into covered gondola cars. The waste packaging activity will involve placing a soil layer in the base of each gondola car, followed by placement of Component 34A and 34B concrete debris and covered with the final soil layer. There will be a concrete/debris to soil mixture not to exceed 16% for each gondola car. This will ensure the 5,000 pCi/g Envirocare requirement is met. Once the packaging activity is complete, the gondola cars containing concrete from Components 34A & 34B will be dispositioned to Envirocare.

The debris commingling information contained in the following paragraph does not pertain to Components 34A & 34B concrete debris.

As stated in Section 3.3.2.2 of the OU3 Integrated RD/RA Work Plan, materials will be identified according to the OU3 debris categories identified in the MSCC. The MSCC for Silos 1&2 Bridges allows for commingling of OU3 debris categories A, B and D into the same Roll-Off Boxes (ROBs) or Articulating Dump Trucks (ADTs) since each of these material types conform to OSDF Impacted Material Category 2. Debris Category E (concrete) will be placed in separate ROBs or ADTs. Commingling of OU3 debris categories A, B and D is being done to conform to the OSDF impacted material categories in order to facilitate placement. By allowing the commingling of these types of debris into the same ROB or ADT, there will be more efficient use of a limited number of available ROBs and ADTs at the FCP. Materials will be containerized inside the project boundaries adjacent to structures being dismantled. It is currently planned that filled containers will be covered/sealed, screened for exterior radiological contamination, inspected, tagged, and transported directly to the OSDF Transfer Area. Should any materials be encountered that do not meet the OSDF waste acceptance criteria (e.g., materials with "visible process residues" as defined in Specification Section 01120; they will be segregated from OSDF-bound materials. The piping and structural steel is expected to meet **PCN2** OSDF Waste Acceptance Criteria (WAC). Any material failing to meet OSDF WAC will be size reduced as required to meet Envirocare WAC and transported to SP-7 for staging pending shipment to Envirocare.

5922

TABLE 2-1 Components 34A, 34B and Silos 1&2 Bridges Bulked Material Volume Estimates (yd^3)

Component Number	OU3 Debris Categories								
	Cat. A	Cat. B	Cat. C	Cat. D	Cat. E	Cat. F/G/H	Cat. I	Cat. J	Totals
34A	0	10	N/A	0	450	N/A	0	0	460
34B	0	10	N/A	0	450	N/A	0	0	460
G-008	1912	1912	N/A	0	0	N/A	0	0	3824
22E	0	20	N/A	0	0	N/A	0	0	20
F34-4	0	10	N/A	0	0	N/A	0	0	10
Complex Total	1912	1962	N/A	0	900	N/A	0	0	4774
Container/ Quantity	ROB or ADT 64	ROB or ADT 66	N/A	N/A	ROB or ADT 45	N/A	N/A	N/A	
Interim Storage	OSDF Transfer	OSDF Transfer	N/A	N/A	Soil Pile 7	N/A	N/A	N/A	
Disposition	OSDF	OSDF	N/A	N/A	Envirocare	N/A	N/A	N/A	

General Notes:

OU3 Debris Categories: Cat. A – Accessible Metals; Cat. B – Inaccessible Metals; Cat. C – Process-Related Metals; Cat. D – Painted Light Gauge Metals; Cat. – Concrete; Cat. F – Brick; Cat. G – Non-Regulated ACM; Cat. H – Regulated ACM; Cat. I – Miscellaneous Materials; Cat J – Special Handling.

ROB: Roll-Off Box holds 30 cubic yards (810 cubic feet) and/or 16.95 tons of material; ADT: Articulating Dump Truck holds up to 18 cubic yards of materi
WMB: White Metal Box holds 80 cubic feet with a weight restriction of 8000 pounds. **DM:** 55-Gallon Drum

OSDF Transfer: On-site Disposal Facility Transfer area. Refers to direct disposal in the OSDF; however, the ability to deliver debris directly to the OSDF Transf Area is dependent on whether the OSDF is accepting debris and/or availability of containers (ROBs) for transport. If necessary, Category A, B, D, and E debr may be temporarily stockpiled on the Pilot Plant Pad at project completion.

TABLE 2-2 Components 34A, 34B and Silos 1&2 Bridges Unbulked Material Volume Estimates (yd^3)

Component Number	OU3 Debris Categories								
	Cat. A	Cat. B	Cat. C	Cat. D	Cat. E	Cat F, G & H	Cat. I	Cat. J	Totals
34A	0	3	N/A	0	225	N/A	0	0	228
34B	0	3	N/A	0	225	N/A	0	0	228
G-008	638	638	N/A	0	0	N/A	0	0	1276
22E	0	6	N/A	0	0	N/A	0	0	6
F34-4	0	3	N/A	0	0	N/A	0	0	3
Complex Total	638	653	N/A	0	450	N/A	0	0	1741

General Note
Refer to Table 2-1 for OU3 Debris Category descriptions.

TABLE 2-3 Components 34A, 34B and Silos 1&2 Bridges Material Weight Estimates (Tons)

Component Number	OU3 Debris Categories								
	Cat. A	Cat. B	Cat. C	Cat. D	Cat. E	Cat. F, G & H	Cat. I	Cat. J	Totals
34A	0	3	N/A	0	375	N/A	0	0	378
34B	0	3	N/A	0	375	N/A	0	0	378
G-008	1275	638	N/A	0	0	N/A	0	0	1913
22E	0	2	N/A	0	0	N/A	0	0	2
F34-4	0	1	N/A	0	0	N/A	0	0	1
Complex Total	1275	647	N/A	0	750	N/A	0	0	2672

General Note:
Refer to Table 2-1 for OU3 Debris Category descriptions.

The current project strategy for managing debris is to deliver containerized debris directly to the OSDF Transfer Area; however, stockpiling of Category A, B and D for interim storage is a possibility due to the limited number of ROBs and ADTs at the FCP. Stockpiling of debris, if utilized, will follow the strategies provided under Section 3.3.2.3 of the OU3 Integrated RD/RA Work Plan, which requires best available storage configuration for OU3 Debris Categories A, B, and D. The strategy for stockpiling also requires removing or encapsulation of contaminants. Specification Section 01517 debris release criteria requires that gross contamination be

removed or encapsulated on debris surfaces prior to their removal from a building enclosure or local containment. To the maximum extent practicable, debris will be containerized following sizing when sufficient containers are available. Should the best available storage configuration (i.e., containers with lids or tarps) be temporarily unavailable, stockpiling of debris that meet the release criteria on pads with run-off controls would be performed. In the event stockpiling becomes necessary, all site requirements will be met.

Material tracking is performed using the Site-Wide Waste Information, Forecasting and Tracking System/Integrated Information Management System (SWIFTS/IIMS) through the FCP waste acceptance organization. Project-specific reporting on material disposition will be provided by a SWIFTS/IIMS summary in the Project Completion Report. Section 3.3.2.2 (Segregation, Containerization, Tracking) of the OU3 Integrated RD/RA Work Plan describes material tracking and reporting using SWIFTS. OU3 Debris Categories A, B, and D debris are classified as OSDF Category 2 material. Therefore, commingled Debris Categories A, B and D quantities will be tracked in SWIFTS/IIMS under a discreet Material Evaluation Form that corresponds to Impacted OSDF Category 2 debris in interim storage. Since the volume of commingled debris will represent a combination of waste streams, proportions of OU3 debris categories within that total volume will be derived based on original estimates to identify and track waste volumes by OU3 debris category. These derived quantities will be documented in the Project Completion Report for the OU4 Complex. Other than tracking debris specifically for the purpose of OSDF placement, project-specific material tracking and reporting strategies for the OU4 Complex D&D project do not differ from the strategies laid out in the OU3 Integrated RD/RA Work Plan and therefore no additional details were developed during the remedial design process.

The disposition strategy for Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges material is consistent with the requirements stated in the OU3 Final ROD and strategies presented in the OU3 Integrated RD/RA Work Plan. Table 2-1 identifies that debris generated from Component G-008 (Silos 1&2 Bridges) will be placed in the OSDF. No treatment will be necessary for those materials destined for on-site disposal since all chemical-based waste acceptance criteria are met based on OU3 RI/FS data.

Debris from Components 34A, 34B and F34-4 (Decant Sump Tank) will be dispositioned to Envirocare. If practical. the K-65 Trench steel piping system will be cleaned using high pressure washwater within containment to meet OSDF placement criteria. Other debris that cannot be dispositioned in the OSDF, either because the OSDF is not open or the debris does not meet the OSDF WAC, will also be dispositioned at Envirocare via the WPRAP rail system. If this option is not available, another offsite disposal facility (TBD) will be used. Debris that fails to meet OSDF WAC will be staged at SP-7 pending offsite shipment. **PCN2**

2.3.5 Material Recycling/Reuse

Accessible metals (Category A) from Silos 1&2 Bridges have been evaluated for potential recycling options and a detailed summary of that evaluation is available in Appendix B. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), 1,275 tons of potentially recyclable accessible metals (OU3 Debris Category A) from all Silos 1&2 Bridges were evaluated by comparing the three leading alternatives to on-site disposal. Of the three phases of the Decision Methodology (Threshold Phase, Life Cycle Analysis Phase, and Decision Phase), only the first phase was applied since the comparative evaluation of project costs for each alternative showed that the total costs for each of the recycling options greatly exceed the 25 percent total cost criteria compared to OSDF.

2.4 Environmental Monitoring

Environmental monitoring for the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project will include supplemental radiological environmental air monitoring and wastewater monitoring. Groundwater monitoring is not needed to support this project but would be employed if necessary, as described in Section 3.6.2.3 of the OU3 Integrated RD/RA Work Plan.

Project-specific stormwater management is governed by the FCP Stormwater Pollution Prevention Plan (DOE 1996b) and any monitoring associated with that program is managed by OU5/Aquifer Restoration Project. Project-specific stormwater management includes the diversion of stormwater to appropriate site collection drains surrounding the project. The concrete trench for stormwater runoff control currently in place around Silos 1&2 will be maintained until initiation of soil remediation around the silos footprint when a new stormwater runoff control will be put in place to support the excavation.

Surface Water (Wastewater) Monitoring

Section 2.3.2 of this Implementation Plan describes the wastewater management strategies that have been developed for the D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges. The OU3 Integrated RD/RA Work Plan describes the overall strategies to be implemented for project monitoring of wastewater. Listed below are the specific references in the Work Plan:

- Section 3.2.5, Surface Decontamination: Wastewater collection and management strategies.
- Section 3.3.3, Management of Secondary Waste: The overall strategy for managing wastewater, as one of the primary aspects of secondary waste, through the site wastewater treatment system.
- Section 3.5.2, Management of Contaminated Water: References site procedure to be used for contaminated wastewater evaluation/management.

5922

- Sampling and Analysis Plan (SAP)/Section 2, General Sampling and Data Collection Approach: Focuses on wastewater sampling, among other aspects of sampling.
- SAP/Section 3, Specific Sampling Programs: Sampling for disposition of wastes, including wastewater. Determination of hazardous, radiological, and other waste characteristics.

Potential elevated levels of contaminants of concern may be present within Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges. Based on an estimated 10,000 gallons of potential washwater, it is anticipated that up to five samples will be taken to determine isotopic radiological and heavy metals concentrations prior to discharge into the Advanced Wastewater Treatment Facility. Of those five samples, one will be a duplicate for quality assurance/quality control purposes. The purpose of the sampling is to ensure the adequacy of treatment capacity so that National Pollutant Discharge Elimination System (NPDES) permit requirements are met.

Project-specific reporting for wastewater will be provided in the project completion report. The report will include a summary of the data generated during the project. The report will include a summary of the results from sampling and analysis prior to its discharge into the WWTS.

Radiological Air Monitoring

Occupational monitoring will be performed using personal and workplace air samplers in the work areas to ensure worker protection and will also serve as an indication of the effectiveness of engineering controls. Any potential emissions that could affect the outside environment would be detected first by environmental and occupational monitoring. Section 8.1 of the OU3 RD/RA Health and Safety Plan (Appendix E of the OU3 Integrated RD/RA Work Plan) describes the occupational air-monitoring program.

Environmental radiological air monitoring during the D&D of Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges will consist of the Fernald Site Environmental Monitoring Program described in the site-wide IEMP, and discussed in Sections 3.5.1 and 3.6.2.1 of the OU3 Integrated RD/RA Work Plan. FCP boundary monitors are shown in Figure 2-1.

The supplemental radiological air-monitoring program implemented in preparation for operation of the Silos 1&2 Remediation facility (as outlined in the Silos 1&2 Remedial Design Package) will be maintained during the Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D activities. The sitewide IEMP also describes the locations of the radon monitors. The radon monitor locations for Silos operations will be removed or relocated as required for excavation and demolition of the Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges. FCP radon monitors are shown in Figure 2-2.

Fernald Closure document SD-2011, Silos 1&2 Demolition ALARA and Air Sampling Plan (DOE 2005b) was developed by Silos Radiological Engineering to address isotopes of concern, sampling methods, placement and analysis for the protection of personnel working in or **PCN2**

5022

adjacent to the described activities. Also, this document provides detail with respect to source terms, area and personnel monitoring, engineering/administrative controls and response to abnormal/unexpected air sampling results.

An analysis of the residual source term for Silo 1 has been completed and documented as the technical basis for the Project Specific Air Sampling Plan. At this time, Fernald Closure document SD-2095, Silo 1 Residual Source Term and Radon Production Rate Determinations, (Appendix F) has been issued.

An analysis of the residual source term for Silo 2 has been completed and documented as the technical basis for the Project Specific Air Sampling Plan. At this time, Fernald Closure document SD-2098, Silo 2 Residual Source Term and Radon Production Rate Determinations, (Appendix G) has been issued.

These analysis will serve as a synopsis of the evaluations and derivation methods used to establish the potential source terms and dispersible quantities contained within the concrete structures and the potential local and fence line concentrations of both particulate radionuclides, radon gas and associated progeny.

Pursuant to Specification Section 05126, the project team, with oversight by FCP Project Management, prepares work control documents that specify the methods for structural steel removal that contain the following information:

- Detailed sequence of dismantlement and method of cutting, including equipment to be used;
- Methods for contaminant control, including fugitive emissions during cutting;
- Detailed plan for controlling airborne radiological emissions;
- If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Registered Professional Engineer; and
- Plans for personnel tie offs, use of pick boards and walking on or near roof purlins/girders.

Furthermore, Specification Section 05126 requires that the Fluor Fernald self-perform project team apply mechanical means of cutting to remove the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

Concrete Removal

Pursuant to Specification Section 03315, the project team, with oversight by FCP Project Management, prepares work control documents that specify the methods for concrete removal that contains the following information:

- Detailed method and sequence of dismantlement, including equipment to be used;
- Methods for control of contaminants, including control of fugitive emissions;
- Materials, such as non-woven geotextile fabrics and surfactants, to be used;
- Methods of cutting, including equipment to be used;
- Calculations to verify structural adequacy of partially dismantled structure, as applicable; and
- If dismantlement method requires personnel on the roof, Fluor Fernald Engineering shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

Specification Section 01515 addresses requirements relative to the preparation of the base slab during demobilization. Specifically, openings in the slab will be filled with granular material or soils and grout to provide a flat uniform surface to minimize the chance for water accumulation & migration and to mitigate potential safety hazards. If the slabs cannot be excavated directly after above-grade D&D activities, the remaining below-WAC Silos 1&2 berm soil will be used to cover the slabs. Prior to below-WAC soil placement, the slabs will be covered with a geotextile material to prevent contact between the below-WAC soil and the

PCN2

5922

existing slab. Wire and cable will be cut away to grade from the conduit embedded in the concrete.

2.6 Additional D&D Activities Detail

Phase 1 D&D Activities

Prior to D&D, isolation verifications will be completed for the following equipment:

- The abandoned Radon Control System hoses and electrical conduits located on the earthen berm.
- The high-pressure water to duct spool pieces (3) between Silo 1 and the Silo 1 Bridge.
- The Silo 1 slurry and sluice piping and the RCS ducting.

Once the respective isolation verifications are complete, the Fluor Fernald Self-Perform Group will perform the following D&D activities:

- Remove, size-reduce and containerize the Radon Control System hoses and electrical conduits located on the earthen berm.
- Size-reduce and containerize the Radon Control System hose support steel located on the east side of Silo 2 earthen berm.
- Remove, size-reduce and containerize the "T" posts and woven wire fencing on and around the earthen berm.
- Remove, size-reduce and containerize other miscellaneous equipment as required to support excavation of the earthen berm.
- Remove duct spool pieces (3) between Silo 1 and the Silo 1 bridge, cover resulting module and silo openings with ¾" plywood and "C" clamps.
- Cut visual inspection access for WAO (Waste Acceptance Operations) in isolated Silo 1 slurry and sluice piping and RCS ducting as directed by WAO.
- Transport the resulting debris to the On-Site Disposal Facility (OSDF) for placement.

Berm Removal

Prior to Phase 2, 3 & 4 D&D activities, the earthen berm will be excavated and removed by the Fluor Fernald Self-Perform Group per Silos Design Change Notice #40710-DCN-724. During the earthen berm excavation, the Silos Project will conduct core sampling of the Silos 1&2 concrete wall, remove the Decant Sump standpipe and pump out the sump contents.

Phase 2 D&D Activities

Upon completion of the earthen berm removal, the Fluor Fernald Self-Perform Group will perform the following D&D activities:

5922

- Rig and torch-cut the Silo 1 east and west stair tower sheet piling at grade.
- Size reduce and containerize the sheet piling.
- Transport the resulting debris to the OSDF for placement.
- Establish Silo 1 dust suppression, air monitoring and radiological/construction boundaries.
- Demolish the Silo 1 concrete walls and dome utilizing a track hoe with concrete processor attachment.
- Transport the Silo 1 sized concrete wall and dome debris to Soil Pile 7 (SP-7).
- Cover the remaining grout and at-grade slab with soil. Note: The Silo 1 grout and at-grade slab will remain in place until excavation of all waste pit material is complete and until sufficient gondola cars with lids are available for sized concrete debris shipment.
- Remove the Silo 1 grout, weir boxes and soil cover.
- Transport the Silo 1 grout, weir boxes and soil cover to SP-7, blend with soil and load into rail cars.
- Demolish Silo 1 at grade slab, transport the Silo 1 at-grade slab sized debris to SP-7, blend with soil and load into rail cars.

Phase 3 D&D Activities

Upon completion of Phase 2 D&D and the Silo 2 waste retrieval activities, final cleanout of the Decant Sump and all Silo 1&2 safe shutdown activities by the Silos Project, the Fluor Fernald Self-Perform Group will perform the following D&D activities:

- Remove, inspect, wash (if necessary) and containerize the Decant Sump discharge line attached to Silo 1 bridge steel.
- Remove all piping, conduit and structural steel from the Silo 1 east stair tower north to the common Silo 1&2 bridge support tower.
- Demolish the Silo 1 Bridge by pulling the bridge south.
- Shear and load-out all bridge steel and equipment, segregate plate steel requiring torch cutting to an adjacent location and torch-cut/load-out.
- Rig and cut the common east to west bridge steel and piping between the common Silo 1&2 bridge support tower east to the location of system air gaps.
- Transport the resulting debris to the OSDF for placement.

Phase 4 D&D Activities

Upon completion of the Silo 2 weir box removal and grouting, the Fluor Fernald Self-Perform Group will perform the following D&D activities:

- Remove the duct spool pieces (3) between Silo 2 and the Silo 2 bridge, cover resulting module and silo openings using ¾" plywood and "C" clamps.
- Cut visual inspection access for WAO in the isolated Silo 2 slurry and sluice piping and RCS ducting as directed by WAO.

5922

- Rig and torch-cut the Silo 2 east and west stair tower sheet piling at grade.
- Size-reduce and containerize the sheet piling.
- Transport the resulting debris to the OSDF for placement.
- Establish Silo 2 dust suppression, air monitoring and radiological/construction boundaries. PC
- Demolish the Silo 2 concrete walls and dome utilizing a track hoe with concrete processor attachment. PC
- Transport the Silo 2 sized concrete wall and dome debris to Soil Pile 7 (SP-7). PC
- Cover the remaining grout and at-grade slab with soil. Note: The Silo 2 grout and at-grade slab will remain in place until excavation of all waste pit material is complete and until sufficient gondola cars with lids are available for sized concrete debris shipment. PC
- Remove the Silo 2 grout, weir boxes and soil cover. PC
- Transport the Silo 2 grout, weir boxes and soil cover to SP-7, blend with soil and load into rail cars. PC
- Demolish Silo 2 at grade slab, transport the Silo 2 at-grade slab sized debris to SP-7, blend with soil and load into rail cars. PC
- Remove all the piping, conduit and structural steel from the Silo 2 east stair tower south up to and including the common Silo 1&2 bridge support tower. PC
- Demolish the Silo 2 Bridge by pulling the bridge south. PC
- Shear and load-out all the bridge steel and equipment, segregate plate steel requiring torch cutting to an adjacent location and torch-cut/load-out. PC
- As necessary, excavate to expose the Decant Sump structure.
- Demolish the Decant Sump structure, load-out debris to SP-7 and blend with soil.
- The K-65 Trench pipe (remaining Component 22E) and any piping beneath the silo slabs will be removed, size-reduced, visually inspected by WAO and dispositioned per WAO direction.

2.7 Use of New Technologies

The performance specifications provide an avenue for FCP Project Management to use new and/or innovative technologies. The use of any new and/or innovative technologies will be identified in the work control documents prepared by the project team with oversight by FCP Project Management to provide safer, quicker, and/or less expensive remediation. Information relating to any new or innovative technologies incorporated during the decontamination and demolition activities will be issued with a submittal letter to the regulatory agencies.

3.0 COMPONENT-SPECIFIC REMEDIATION

This section presents component-specific remediation tasks identified for the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project. Structural (floor plan, elevation and section view) drawings have been compiled for Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges and are shown in Appendix D (see Appendix D list of drawings for component identification). Photographs illustrating buildings/components throughout the Complex are provided in Appendix E (see listing of photograph numbers and accompanying drawing in Appendix E for photograph identification). Information regarding the remediation approach was obtained from the performance specifications and the OU3 Integrated RD/RA Work Plan.

Additional detail information is contained in the Silos project specific RD Work Package. Ref. 40750-RP-0028, Silos 1&2 Remediation Facility Remedial Design Package.

3.1 Component 34A – K-65 Storage Tank (Silo 2)

Background

Component 34A is a large, cylindrical, above-grade concrete tank with steel reinforcement. Component 34A measures 80 ft in diameter, 27 ft high at the top of the wall and 36 ft high at the center of the dome. The walls are eight inches thick and cast in place with 4500 pounds per square inch (psi) concrete. The walls are wrapped with post-tensioned steel wires and covered with one-inch gunite. The wall is tied to the floor and dome with reinforcement steel.

The dome concrete thickness varies from four inches at the center to eight inches at the circumference and cast in place with 4500 psi concrete. Dome reinforcement consists primarily of welded wire mesh. Openings were enlarged on the silo dome for installation of dome risers for the Silos AWR project. Sluice nozzles and slurry pumps were deployed through the risers to accomplish the bulk waste retrieval. The silo also has PRVs installed and risers connecting to RCS piping to reduce the radon concentration in the silo headspace.

The floor is constructed of four inches of reinforced 3000 psi concrete. Beneath the floor is an underdrain system. The underdrain system consists of a two-inch slotted pipe in an eight-inch gravel layer. The gravel layer is underlain by a two-inch thick layer of asphaltic concrete followed by a 17-inch thick layer of compacted clay. The silo has a two-foot high by five-inch wide skirt wall offset seven inches from the silo. The floor of the silo will be covered with up to three feet of grout used to encapsulate the final residual heel material.

There is a berm embankment that provides reduction of radon emissions, and increased shielding. The slope of the berm is 3:1.

Process Area Description

Component 34A contained approximately 120,000 ft^3 of residues, including Radium-226,

922

Thorium-230, bentonite, water, and discrete objects generated from the processing of high-grade uranium ores. The silo was a major source of radon because if its high radium concentration. Samples of the silo material exceeded the EPA TCLP limit for lead. Removal of the residues will be completed during the OU4 remediation action. Direct radiation from the embedded residual material will still be encountered. Discrete foreign objects and debris may be left in the silo.

Remedial Tasks

Four remedial tasks apply to the D&D of Component 34A.

Preparatory Action: Facility Shutdown

Prior to dismantlement, the Silos group will perform shutdown activities for Component 34A which includes removing any gross Silo 2 material for packaging and disposal. The weir and baffle boxes will be removed to facilitate removal of residual material in the decant ports. The remaining residual material at the bottom of the silo will be mixed with lean cement mix to stabilize contaminants and reduce radiological concentration. Approximately one to three feet of grout could be placed in the bottom of the silo.

Berm Removal

The Soils group will remove the berm embankment prior to the start of Component 34A demolition. The berm soil will be excavated and disposed of in accordance with the requirements of Soil Remediation Area 7. The Component 34A berm will be removed using the combination of an excavator, small bulldozer and several trucks for soil loadout.

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Component 34A does not include any particular strategies beyond those already presented in Section 2.5.3. other than initially using the sluicer nozzles for gross decontamination.

Above-Grade and At-Grade Dismantlement

Component 34A is constructed of concrete. Component 34A and the Component 34A concrete slab will be dismantled using a track-hoe mounted, hydraulic shear, backhoe and concrete processor. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of concrete and miscellaneous steel. PCN

3.2 Component 34B – K-65 Storage Tank (Silo 1)

Background

Component 34B is a large, cylindrical, above-grade concrete tank with steel reinforcement. Component 34B measures 80 ft in diameter, 27 ft high at the top of the wall and 36 ft high at the center of the dome. The walls are eight inches thick and cast in place with 4,500 pounds per square inch (psi) concrete. The walls are wrapped with post-tensioned steel wires and

covered with one-inch gunite. The wall is tied to the floor and dome with reinforcement steel. The dome concrete thickness varies from four inches at the center to eight inches at the circumference and cast in place with 4,500 psi concrete. Dome reinforcement consists primarily of welded wire mesh. Openings were enlarged on the silo dome for installation of dome risers for the Silos AWR project. Sluicer nozzles and slurry pumps were deployed through the risers to accomplish the bulk waste retrieval. The silo area also has PRVs installed and risers connecting to RCS piping to reclude the radon concentration in the silo headspace.

The floor is constructed of four inches of reinforced concrete. Beneath the floor is an underdrain system. The underdrain system consists of a two-inch slotted pipe in an eight-inch gravel layer. The gravel layer is underlain by a two-inch thick layer of asphaltic concrete followed by a 17-inch thick layer of compacted clay. The silo has a two-foot high by five-inch wide skirt wall offset seven inches from the silo. The floor of the silo will be covered with up to three feet of grout used to encapsulate the final residual heel material.

There is a berm embankment that provides reduction of radon emissions, and increased shielding. The slope of the berm is 3:1.

Process Area Description

Component 34B contained approximately 120,000 ft^3 of residues, including Radium-226, Thorium-230, bentonite, water, and discrete objects generated from the processing of high-grade uranium ores. The silo was a major source of radon because of its high radium concentration. Samples of the silo material exceeded the EPA TCLP limit for lead. Removal of the residues will be completed during the OU4 remediation action. Direct radiation from the embedded residual material will still be encountered. Discrete foreign objects and debris may be left in the silo.

Remedial Tasks

Four remedial tasks apply to the D&D of Component 34B.

Preparatory Action: Facility Shutdown

Prior to dismantlement, the Silos group will perform shutdown activities for Component 34B which includes removing any gross Silo 1 material for packaging and disposal. The weir and baffle boxes will be removed to facilitate removal of residual material in the decant ports. The remaining residual material at the bottom of the silo will be mixed with lean cement mix to stabilize containments and reduce radiological concentration. Approximately one to three feet of grout could be placed at the bottom of the silo.

Berm Removal

The Soils group will remove the berm embankment prior to the start of Component 34B demolition. The berm soil will be excavated and disposed of in accordance with the requirements of Soil Remediation Area 7. The Component 34B berm will be removed using the combination of an excavator, small bulldozer and several trucks for soil loadout.

5922

Surface Decontamination

Surface decontamination will be performed to reduce potential airborne contamination resulting from the D&D activities. Surface decontamination of Component 34B does not include any particular strategies beyond those already presented in Section 2.5.3. other than initially using the sluicer nozzles for gross decontamination.

Above-Grade and At-Grade Dismantlement

Component 34B is constructed of concrete. Component 34B and the Component 34B concrete slab will be dismantled using a track-hoe mounted, hydraulic shear, backhoe and concrete processor. Material take-off estimates identify that the majority of debris from structural dismantlement will consist of concrete, and miscellaneous steel. PCN

3.3 G-008 – Silos 1&2 Bridges

Background

G-008 (Silos 1&2 Bridges) are constructed of structural steel. The Silos 1&2 bridge measures 53'-1" in height, 175-ft in length, and 18-ft in width. The Silos 1&2 bridge supports all silo equipment modules, skidded equipment and pipe. Each bridge is accessible from a stair tower on both the east and west ends.

The steel bridge Silos 1&2 steel bridge carbon steel shielding thickness varies from 2.5 in. at the silo center to ½ in. at the silo perimeter, as shown below:

0.5 in.	1.5 in.	2.5 in.	2.5 in.	2 in.	1.5 in.	0.5 in.
r = 38 – 28 ft	r = 28 – 16 ft	r = 16 – 0 ft	r = 0 - 10 ft	r = 10 – 22 ft	r = 22 – 34 ft	34 – 36 ft

The east to west bridges over the silos are connected and accessible from a north to south bridge.

Process Area Description

The Silos 1&2 stationary bridge was constructed over each silo to support silo waste retrieval operations. The stationary bridge was equipped with two sluice modules and one slurry/decant pump module for each silo operation. The north to south connecting bridge is equipped with diverter valve housing, cable tray and piping. The sluice and slurry transfer piping is double-walled, except within the diverter valve containment areas and modules. Outdoor pipelines are insulated and heat-traced. The pipeline is also provided with systems to monitor pipeline pressures and measure slurry density.

5.0 MANAGEMENT

5922

The implementation of the OU4 Complex Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges D&D project will be performed through a coordinated effort by the Fluor Fernald self-perform project team, Fluor Fernald Project Management, support organizations and DOE Project Management. Section 7 of the OU3 Integrated RD/RA Work Plan provides the overall management structure applied to this remediation project. A description of project-specific management responsibilities has been highlighted for Silos 1&2 Components 34A (Silo 2), 34B (Silo 1) and Silos 1&2 Bridges in this section.

DOE will provide direct project oversight in two ways, both of which become a concerted effort to ensure that remedial activities are performed according to project specifications and requirements. The DOE Office of Operations Assurance has assigned a Facility Representative from the Fernald Field Office whose responsibilities will be to perform independent field oversight of all remedial activities performed under this project. This individual will be responsible for weekly coverage of all field activities and necessary reporting to the DOE–FCP Site Manager. The Facilities Representative will have the authority to stop work if conditions warrant such action. DOE-FCP will also conduct field oversight in the areas of construction, engineering, quality assurance, and health and safety. The DOE Facilities Representative and others will immediately notify the DOE Project Manager of any issues or problems that arise in an effort to seek prompt resolution.

The DOE Project Manager and the environmental management contractor, Fluor Fernald, will oversee the remedial action through its project team review and approval process and by performing the following functions:

- ensuring that the Fluor Fernald self-perform project team is provided with the proper direction and support necessary to meet the remedial action objectives for this project;
- detailing all work conditions and scope requirements;
- conducting a kick-off meeting where all project personnel will be instructed on the work control documents, pre-construction meetings, daily pre-work scope and safety briefings, and weekly project team meetings to address all concerns, schedule status, planning, progress, and deviations;
- performing quality assurance and quality audits of all remediation tasks to determine adherence to project specifications;
- verifying work is performed in compliance with approved health and safety plans and work control documents; and
- performing pre-final and final inspections.

The Fluor Fernald self-perform project team will perform D&D of the components, material sizing, segregation, and loading into containers and/or stockpiling. FCP Waste Generator Services personnel will perform transport of containers to and from the project area.

5922

REFERENCES

U.S. Department of Energy, 1993a, *Operable Unit 3 Remedial Investigation and Feasibility Study Work Plan Addendum,* Final, prepared by Fluor Environmental Restoration Management Corporation, Cincinnati, Ohio

U. S. Department of Energy, 1993b, DOE Order 5400.5 *Radiation Protection of the Public and the Environment.*

U.S. Department of Energy, 1996a, *Operable Unit 3 Record of Decision for Final Remedial Action*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1996b, *FCP Stormwater Pollution Prevention Plan*, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997, *Operable Unit 3 Integrated Remedial Design/Remedial Action Work Plan*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 2001, *Multi-Complex Implementation Plan for Above-Grade Decontamination and Dismantlement* Final, prepared by Fluor Fernald Inc., Cincinnati, Ohio

U.S. Department of Energy, 2003, *Silos 1&2 AWR Remedial Design Package Chapter 4; Berm Excavation Plan AWR Project* Final, prepared by Fluor Fernald Inc., Cincinnati, Ohio

U.S. Department of Energy, 2005a, *Area 7 Support Areas Integrated Remedial Design Package* Final, to be prepared (May 2005) by Fluor Fernald Inc., Cincinnati, Ohio PCI

U.S. Department of Energy, 2005b, *Silos 1&2 Demolition ALARA and Air Sampling Plan* Final, prepared by Fluor Fernald Inc., Cincinnati, Ohio PCN

APPENDIX H

FENCELINE PARTICULATE IMPACT OF SILOS 1&2 D&D

PCN2

This page left intentionally blank.

FENCELINE PARTICULATE IMPACT OF SILOS 1&2 D&D

The total residual radionuclide inventory in Silo 2, estimated based upon visual observation, process knowledge, and known characteristics of Silo 2 material, was utilized as a worst-case starting point for the source-term calculation. Only a small fraction of the total inventory was assumed to be available for release during demolition as a result of the decontamination procedures (multiple high pressure water washes of the silo walls, followed by grouting of the silo floor). Based upon standard calculation methods, a small fraction of the available inventory was assumed to become suspended, and a fraction of the suspended material released based upon experience with the demolition methods and control measures (water spray, etc,).

The release rates estimated as described above were input to the BEEST dispersion model, utilizing actual 1989 FCP meteorological data to calculate the maximum 24-hour average fenceline concentrations of each of the target radionuclides.

Radionuclide	Total inventory (Ci)	Source term (Ci) (1e-6)	Conversion to pCi	Release rate over 24 hrs (8.64e4 s)	Fraction of BEEST input	Fence line Conc. (fraction x 2.1E-4 pCi/l)	Conversion to Ci/m^3
Ac-227	.081	8.1e-8	8.1 e4	.9375	.0009	**1.89e-7**	**1.89e-16**
Ra-226	3.24	3.24e-6	3.24e6	37.5	.0375	**7.87e-6**	**7.87e-15**
Th-230	.939	9.39e-7	9.39e5	10.87	.011	**2.31e-6**	**2.3e-15**
Th-232	.013	1.3e-8	1.3e4	.1504	.00015	**3.2e-8**	**3.2e-17**
U-234	.013	1.3e-8	1.3e4	.1504	.00015	**3.2e-8**	**3.2e-17**
U-235/236							
U-238	.013	1.3e-8	1.3e4	.1504	.00015	**3.2e-8**	**3.2e-17**
Th-234							
Ra-228							
Ac-228							
Ra-224							
Th-231							

The maximum 24-hour concentrations were extrapolated over a 96-hour period, represent the projected timeframe over which them concrete from Silos 1 and 2 is being demolished and exposed prior to being covered to obtain the total release and resulting maximum incremental fenceline dose resulting from demolition of the Silos 1 and 2 structures. This dose calculation will estimate the affect of air emissions at the site boundary (formerly the site fenceline) during Decontamination and Dismantlement (D&D) of the K-65 Silos structures. In addition, this estimation will include the Site's ability to demonstrate compliance with the National Emissions Standards for Hazardous Air Pollutants (NESHAP) dose limit of 10 millirem (mrem) per year to members of the public.

The D&D of the K-65 Silos structures has a planned duration of four days. The radioactivity released by this work will represent an incremental increase in air emissions above ongoing remediation activities at the site. Therefore, the dose estimate of the D&D

of the K-65 Silos structures will be added to historical annual average dose calculations to determine the Site's ability to demonstrate NESHAP compliance. The total release during the four –day period will result in an incremental fenceline dose of approximately one third of one mrem. Combining this with ongoing remediation activities will produce an annual dose equivalent of 1.4 mrem (14 percent of standard). By extrapolation, it would take approximately 100 days of emissions at these levels to jeopardize NESHAP compliance.