Department of Energy

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

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AUG 23 2000

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

DOE-0952-00

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

Dear Mr. Jablonowski and Mr. Schneider:

RESPONSES TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE REMEDIAL DESIGN PACKAGE FOR THE SILO 3 PROJECT

References:
1) Letter, T. Schneider to J. Reising, "Comments - Silo 3 Remedial Design Package," dated July 25, 2000

2) Letter, G. Jablonowski to J. Reising, "Disapproval of the Remedial Design Package for the Silo 3 Project," dated July 21, 2000

3) Letter, J. Reising to G. Jablonowski and T. Schneider, "Remedial Design Package for the Silo 3 Project," dated May 19, 2000

Enclosed for your review and approval is documentation responding to the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) comments on the draft Remedial Design (RD) package for the Silo 3 Project (References 1 and 2). The draft RD package was originally submitted to the U.S. EPA and OEPA for review on May 19, 2000 (Reference 3).

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The following documents are enclosed:

- A comment response document responding to the U.S. EPA's comments, dated July 21, 2000, and to OEPA's comments, dated July 25, 2000
- Page changes to the Process Description, Retrieval Technology Description, and Process Control Plans
- Complete revisions to the Operational Environmental Control Plan, Sampling and Analysis Plan, and Transportation and Disposal Plans
- Copies of the Piping and Instrumentation Diagram (P&ID) drawings referenced in the RD packaged documents

Your input received at the August 15, 2000, meeting has been incorporated into the comment responses.

If you have any questions, please contact Nina Akgündüz at (513) 648-3110 or Joanne Lorence at (513) 648-3114.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Lorence

Enclosures

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cc w/enclosures:
T. Schneider, OEPA-Dayton (three copies of enclosures)
M. Schupe, HSI GeoTrans
F. Hodge, Tetra Tech
AR Coordinator, Fluor Fernald, Inc./78

cc w/o enclosures:
S. Fauver, EM-31/CLOV
N. Akgündüz, OH/FEMP
J. Lorence, OH/FEMP
A. Murphy, OH/FEMP
A. Tanner, OH/FEMP
J. Saric, USEPA-V, SRF-5J
R. Vandegrift, ODH
D. Carr, Fluor Fernald, Inc./2
R. Fellman, Fluor Fernald, Inc./2
T. Hagen, Fluor Fernald, Inc./65-2
J. Harmon, Fluor Fernald, Inc./90
S. Hinnefeld, Fluor Fernald, Inc./31
D. Nixon, Fluor Fernald, Inc./52-4
D. Paine, Fluor Fernald, Inc./52-4
T. Walsh, Fluor Fernald, Inc./65-2
ECDC, Fluor Fernald, Inc./52-7

OHIO EPA COMMENTS ON
SILO 3 REMEDIAL DESIGN PACKAGE

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1. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.0 Pg #: 2 Line #: 5
Code: C

Original Comment #:
Comment: The treated waste will be placed into 55-gallon drums. Is this the best container for the overall project, considering transportation, storage, and management of the large number of containers? Note: A large percentage of the volume reduction realized through treatment will be lost using 55-gallon drums for the waste container.

Response: The density of the final waste form is currently projected to be approximately 150 pounds per cubic foot (pcf). This density dictates the "best" overall container selection for the project. At 150 pcf for the final waste form, the packaging density (taking into account void space) is projected to be between 90 to 120 pcf. At this density range, the net weight of a 55-gallon drum filled to volume capacity would weigh between 675 and 900 pounds (within design limits for most 55-gallon drums). Packaging the final waste into a metal box of approximately 100 cubic feet capacity would weigh between 9,000 and 12,000 pounds, exceeding most design weight limits for that type of container.

Under the current preferred disposal option, the drums will be emptied at the disposal facility prior to disposal of the treated Silo 3 material will be disposed in bulk. Therefore, void space in the drums will not impact final disposal volume.

2. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.0 Pg #: 5 Line #: Code: C
Original Comment #:
Comment: The document does not address the need for "Silo 3 will be equipped with a heating, ventilation and air conditioning system..." Why heat or air condition the silo itself?

Response: The Silo itself is placed under negative pressure during operating life of the project. Air returning to the silo from the retrieval and transfer line leaves the treatment facility at 165 F. This temperature increase is due to the heat of compression from the positive displacement blower that provides vacuum for the retrieval and transfer system. This air stream is cooled prior to returning to the silo.

3. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 1 Line #: Code: C
Original Comment #:
Comment: The introduction section states that 55-gallon drums will be used as the disposal container. This section seems to leave the selection for a disposal container ambiguous.

Response: Section 2.1 text has been modified to state that the disposal container is a 55-gallon drum.

4. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 4 Line #: Code: C
Original Comment #:
Comment: The document states that the Silo 3 material will be gravity fed from the Filter Receiver to the Rotary Valve and into the Processor Feed System. What provisions have been included to ensure that no blockages will occur through this passive portion of the system.

Response: A nozzle on the end of the retrieval hose will limit the amount of large material entering the Filter Receiver. The Rotary valve has a 10" opening not allowing bridging of the material. The Filter receiver walls are at 60 degrees while angle of repose is 43 degrees for material.

5. Commenting Organization: Ohio EPA Commentor: OFFO
Section #:2.1 Pg #: 5 Line #: Code: C
Original Comment #:
Comment: Only having 2 days supply of stabilizer and reducing agent seems to be limiting. Will additional totes of material be stored nearby to allow for continuous operation? The document doesn't address the expected duration of operation but in order to run for any length of time substantial storage area for full totes will be required. Please describe the operational philosophy behind only a 2-day supply hookup and how additional materials will stored/supplied.

Response: Two tote feed systems will be installed for binder and two tote feed systems will be installed for reducing agent, resulting in a two-day supply of each in place at the treatment facility. An additional six totes of each material will be stored near the treatment facility, resulting in an 8-day supply on hand. Changes to text will be made to reflect this.

6. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 5 Line #: Code: C
Original Comment #:
Comment: The absorbent tote feed system will not be installed unless necessary. If this system is necessary what is the estimated down time for the project to install this system and integrate it with the rest of the project?

Response: Foundations will be included in the design. If required, the foundation and tote support will be installed in the field. This should not take longer than 3 weeks. During the 3-week installation period, it will be possible to feed absorbent through one of the binder or reducing agent tote feed systems, thus minimizing downtime.

7. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 6 Line #: Code: C
Original Comment #:
Comment: How will debris that does not fit the described profile be handled? i.e. Heavy and/or larger objects. Please add a section detailing how these type of debris will be handled.

Response: The section referenced in this comment is describing the Silo 3 Material Feed Screen (16-ME-001), which is used to screen the Silo 3 material after being retrieved from the silo, prior to being conveyed to the Silo 3 Material Feed Hoppers. The Raptor arm can be equipped with a delumping tool to break lumps and compacted material prior to retrieval. Large and/or heavy objects would be retrieved and removed from the silo by the Silo 3 Debris Removal System (See RD Package 2.2 Retrieval Technology Description Section 4.4), and would not be conveyed to the Silo 3 Material Feed Screen.

Also, see response to Comment No. 13.

8. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 7 Line #: Code: C
Original Comment #:
Comment: Will the briquettes be "washed" to remove fines prior to packaging? This procedure may help in reducing the spread of contamination.

Response: The briquettes will not be washed. Briquettes will be screened to remove fines prior to storage in surge hopper. In addition, vessels and the load out equipment are kept under slight negative pressure to minimize the spread of contamination during packaging.

9. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 8 Line #: Code: C
Original Comment #:
Comment: The document does not describe whether the treatment process is exothermic due to chemical reaction or pressure. If any exothermic reaction is expected it might lead to high humidity conditions in the drum which would result in free water forming upon cooling. Has the effect of waste product temperature been incorporated into the packaging design?

Response: The Envirobond process is not exothermic. A small amount of heat will be generated due to pressure during the briquetting process. Some of this heat will be dissipated during storage of the briquettes in the surge hopper prior to loading. No appreciable generation of liquid due to condensation after packaging is expected. The packaging procedure will, however, require that absorbent will be placed in each drum prior to filling to absorb any moisture formed due to condensation and prevent the generation of free liquid.

10. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 10 Line #: Code: C
Original Comment #:
Comment: The section needs to be revised to reference the sampling and analysis plan that is included as Section 3.0.

Response: The second sentence on page 10 (Section 2.1) will be revised to "..as determined by the Fluor Fernald Sampling And Analysis Plan For Silo 3 Treated Waste Material (40420-PL-0001), contained in Section 3.0 of this Remedial Design Package."

11. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.1 Pg #: 10. Line #: Code: C
Original Comment #:

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Comment: Storage upon the Silo 3 ISA pad of drums of Silo 3 waste that fail the treatment criteria is not acceptable. These wastes will likely fail TCLP and should not be stored on an uncontrolled storage pad. The wastes must either be immediately reprocessed or moved to an appropriate storage facility.

Response: As discussed in the response to Comment No. 9, the nature of the Silo 3 material and the Envirobond process, along with the proposed packaging procedure, will prevent the generation of free liquids. The design of the Interim Storage Area (ISA) pad meets all substantive RCRA requirements for storage of hazardous wastes that do not contain free liquids. The drums will be stored on pallets, which will prevent contact with liquid resulting from precipitation. The surface of the pad is sloped such that the entire pad surface drains to storm drains connected to the waste pit area storm water collection system.

Containers determined to fail the treatment criteria will either be reprocessed or moved from the ISA pad to an appropriate storage facility, such as the Plant 1 Pad, within 90 days. This design is therefore adequate for storage of any containers that fail TCLP while awaiting reprocessing.

12. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2, General Pg #: Line #: Code: C
Original Comment #:
Comment: Numerous reference are made to the use of high alarm levels for the Off-Gas Filter pressure differential requiring the change of filters. However, low alarm levels are not utilized. Low alarm levels would indicate a failure of the filter. It is very important for the operators to know if a filter failure occurs. The systems should be revised to include a low differential pressure alarm level for all filters.

Response: The differential pressure switch will include provisions for a low-pressure alarm. The control system will be programmed to provide low pressure alarms. The low pressure alarms are discussed in the Process Control Plan (RD Package Section 2.3).

13. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2 Pg #: 3 Line #: Code: C
Original Comment #:
Comment: Again, is there any contingency for handling debris that may be larger than anticipated?

Response: Based upon process knowledge, any debris present in Silo 3 is expected to be limited to simple hand tools, PPE, plastic bags, and similar miscellaneous debris. As stated in the referenced section of the RD Package, the retrieval system is designed to remove debris less than two feet in length in any one direction or less than 20 pounds in weight (full extension)/100 pounds in weight (dead lift). If any debris larger than these limits were to be encountered, retrieval of Silo 3 material could continue, and the debris dealt with upon completion of the project.

14. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2 Pg #: 5 Line #: Code: C
Original Comment #:
Comment: A camera will be on the robot forearm. How will this camera be kept clean and useable for the operators to use during waste retrieval?

Response: The small camera at the forearm of the robot will be provided with a small air purge that will assist in maintaining a clean lens surface.

15. Commenting Organization: Ohio EPA Commentor: OFFO - 3198
Section #: 2.2 Pg #: 7 Line #: Code: E
Original Comment #:
Comment: The description for Exhibit 4.1-4 says "Kraft Save Arm...". "Save" should be "Slave".

Response: Text will be corrected as noted.

16. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2 Pg #: 15 Line #: Code: C
Original Comment #:
Comment: Will the Raptor arm and Mast be capable of sustaining a cave-in of silo material?

Response: The retrieval arm is design to withstand a minor cave-in of the silo material. However this situation will be avoided by using the mining strategy shown in exhibit 4.1-8. Operator training and visual feed back from mounted camera will be used to avoid this situation.

17. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2 Pg #: 16 Line #: 6 Code: E
Original Comment #:
Comment: Change spelling from "masks" to "masts".

Response: Text will be corrected as noted.

18. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2 Pg #: 16 Line #: 11 - 17 Code: C
Original Comment #:
Comment: The second method to change tooling on the ReTriever is by retracting it into the confinement enclosure. Will lengths greater than 3 masts actually fit into the enclosure?

Response: Each mast link and hose segment will be removed from the arm as it is being retracted into the confinement enclosure.

19. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2 Pg #: 16 Line #: Code: C
Original Comment #:
Comment: How will debris larger than the auxiliary ports be managed?

Response: See response to Comment No. 13.

20. Commenting Organization: Ohio EPA Commentor: OFFO
Section #:2.3 Pg #: 8 of 70 Line #: Code: C. - 3198
Original Comment #:
Comment: The range and set point for the "Emissions from Stack" alarm *must* be determined and evaluated for appropriateness.

Response: Initial values for these parameters have been established, and will be incorporated into the table referenced in the comment:

Particulate concentration: 0-10ug/l, alarm at 2 ug/l
Gas Temperature: 0-150 F, low alarm at 45 F, high alarm at 100 F
Alpha activity: 0-1,000 pCi/l (Rn gas), alarm at 400 pCi/l
Gas Velocity: 0-4,000 fpm, low alarm 2,000 fpm, high at 3,000 fpm

As is the standard procedure, the stack alarm set points will be fine-tuned during initial operations to assure identification of elevated emission levels without excessive alarms from factors such as changes in background levels.

21. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Pg #: 10 of 70Line #: Code: C
Original Comment #:
Comment: PT-001 is redundant with section 1.4.1 and that section has range, set point, and alarm values assigned.

Response: Section 1.4.1 gives the regulatory set points for the instrument and section 1.4.2 gives the operating set points for the instrument.

22. Commenting Organization: Ohio EPA Commentor: OFFO
Section #:2.3 Pg #: 10 of 70 Line #: Code: C
Original Comment #:
Comment: WR-303, Response A-"Clean up mess" This makes it clear that the alarm point is not sufficiently protective. The alarm point must be lowered to ensure that there is no "mess" to clean up.

Response: The high level alarm at WR-303 have a set point low enough to assure shut down product packaging and prevent drum overfill. The drum overfill alarm is installed to provide notification and shutdown of packaging as a backup to the high level alarm. The table will be updated to clarify these alarms.

23. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Pg #: 15 of 70Line #: Code: C
Original Comment #:
Comment: Throughout the document reference is made to the use of knife valves. Problems have occurred on other Fernald projects with knife valves becoming blocked with sediment thus preventing full closure. It would seem the valves are even more likely to become blocked under a particulate vacuum system. Evaluate the appropriateness of knife valves and describe similar projects where they have been successfully used.

Response: RMRS has performed an operability reviews of proposed equipment, including the gate valves referenced in this comment, and has considered the problems encountered in previous applications this type of valve at the FEMP. Gate valves (in this case 10 inch knife gate valves)have been chosen because they are standard dilute phase industry components. They are not airtight but dust tight (some valve applications can be upgraded to airtight but

abrasive service cannot). The seals of the knife gate by design do not have to be directly subjected to impingement of material (if properly installed) and if the gate is not lowered into an operating line the gate is not scoured by material. Due to the low bulk density (less than water) of the Silo 3 material, previously encountered problems with blockage by the material during closure of the valve are not expected to occur.

24. Commenting Organization: Ohio EPA Commentor: OFFO - 3198
Section #:2.3 Pg #: 24 of 70 Line #: Code: C
Original Comment #:
Comment: The sentence "The emergency shutdown sequence will be initiated by exceeding regulatory limits for in ensure operator safety" needs to be revised.

Response: Will modify text to "The emergency shutdown sequence will be initiated by exceeding upper operating limits to ensure operator and facility safety."

25. Commenting Organization: Ohio EPA Commentor: OFFO
Section #:2.3 Pg #: 32 of 70Line #: Code: C
Original Comment #:
Comment: During removal operations the silo pressure will be maintained between -2.0 and +0.5 inches WG differential. Why would pressurization of the Silo 3 to +0.5" WG be allowed?

Response: The allowable range of –2.0 to +0.5 inch WG was specified in the Silo 3 Contract based upon structural analysis of the silo. The nominal operating limit is 0.0 inch WG. During normal removal operations, the silo pressure will be maintained between –2.0 and +0.0 inches water gauge differential to the atmosphere to prevent damage to the silo and minimize releases to the environment. Minor transient fluctuations above 0.0 inches of water gauge due to normal component and system operations will be allowed to avoid automatic shutdowns due to short-term minor pressure fluctuations. The control system will be programmed to allow the pressure to rise above 0.0 inches of water gauge, up to +0.2 inches, for up to 90 seconds before automatic shutdown is initiated. The Process Control Plan has been revised to clarify the control strategy for maintaining negative pressure in the silo during retrieval operations.

26. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Pg #: 33 of 70Line #: Code: C
Original Comment #:
Comment: Throughout the document reference is made to monitoring an alarm for 5 or 7 minutes prior to taking action. This seems like a very long time. Provide estimates for the amount of material that may escape or overflow for each instance where such a waiting period is employed. Provide justification for waiting prior to initiating corrective action to any alarm.

Response: The periods between an alarm sounding and the initiation of shutdown are selected to avoid "nuisance" shutdowns for minor fluctuations in process parameters during normal operations, while still assuring that an actual leak or other significant upset is identified and corrected in time to avoid a release.

The specific alarms referenced in this comment are the high and low pressure alarms for the transfer piping between Silo 3 and the treatment facility. This pipe is a double-walled pipe. Any leak in the inner wall will be contained by the outer pipe, thus preventing a release. The response period for these alarms will be reduced to 90 seconds. In addition, other alarm response periods have been reviewed and reduced where appropriate. The necessary changes have been incorporated into Table 1.4.2.

27. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Pg #: 36 of 70 Line #: Code: C

Original Comment #:
Comment: Is system shut down required for removal of debris?

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Response: Debris will be collected in a debris collection container (55-gallon drum). Operation will continue until debris container is full and will pause only while a new container is moved into position.

28. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Pg #: 50 of 70 Line #: Code: C

Original Comment #:
Comment: Rather than smear every container twice, why not incorporate a container washdown with one verification smear? This would seem to limit contamination and decrease worker exposure.

Response: The outside surfaces of the drums are not expected to become contaminated during drum filling operation. A washdown was not included in order to avoid generation and management of liquid waste. If decontamination is required, the containers will be wiped with masslin cloth as required.

29. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Pg. #: 56 of 70 Line #: Code: C
Original Comment #:
Comment: How many totes of bulk feed material fit into the hoppers and how many totes can be stored ahead of time?

Response: Each tote station holds one tote. Two tote feed systems will be installed for binder and two tote feed systems will be installed for reducing agent, resulting in a two-day supply of each in place at the treatment facility. An additional six totes of each material will be stored near the treatment facility, resulting in an 8-day supply on hand.

30. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: General Comment
Line #: Code: C

Original Comment #:
Comment: A preferred site and mode of transportation need to be selected and sufficient detail for rail and the PCDF included as appropriate.

Response: . The text will be revised to indicate the intended disposal facility (Envirocare Of Utah, Inc.) and mode of transportation (truck).

31. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: 2-3 Line #: 36 - 38 Code: C
Original Comment #:
Comment: "Impacts to the local community" should also be included in the criteria for selecting the mode of transportation.

Response: Agree. The risk assessment performed for Operable Unit 4 considered impacts to the public for the different modes of transportation proposed.

32. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: 2-4 Line #: Code: C
Original Comment #:
Comment: Provide map and detail for the most likely PCDF as was provided for NTS option.

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Response: Agree. A map detailing the routes to Envirocare Of Utah, Inc. will be included.

33. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: 2-5 Line #: Code: C
Original Comment #:
Comment: Additional detail on rail transportation to the most likely PCDF needs to be included.

Response: Transportation by truck to Envirocare of Utah, Inc. has been identified as the preferred transportation method for treated Silo 3 material. Other transportation modes, such as the use of rail or intermodal shipment, will be maintained as future options. A discussion of the evaluation of rail shipments, and the basis for identification of truck shipments as the current preferred method, will be added to the Transportation and Disposal Plan.

34. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: 3-2 Line #: 6-24 Code: C
Original Comment #:
Comment: The document lists the substantive requirements for RCRA container management but does not provide detail on how these requirements will be met. Provide information on how these requirements will be met.

Response: The referenced text on Page 3-2 of the Transportation and Disposal plan has been modified to include a table identifying the means of complying with each substantive RCRA container management requirement .

35. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: 3-3 Line #: Code: C
Original Comment #:
Comment: Provide a container storage plan detailing how the drums will be stored on the ISA pad and the maximum number of drums that can be stored.

Response: Information from the container storage plan to detail how the drums will be stored on the ISA pad, and the storage capacity of the pad, has been incorporated into the Transportation and Disposal Plan.

36. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.4 Pg #: 6-2 Line #: 2-3 Code: C
Original Comment #:
Comment: How much volume will actually be reduced when voids from the briquettes and voids from the 55-gallon drums are factored in?

Response: The packaging density of the briquettes, including the associated void volume, is expected to be 120 lb/ft3. The drums are expected to be filled to 85% capacity. The mass balance takes into account the briquette, void space and drum fill capacity. The basis for the stated volume reduction is the expected maximum silo 3 material density of 58 lb/ft3.

Under the current preferred disposal option, the drums will be emptied at the disposal facility prior to disposal of the treated Silo 3 material will be disposed in bulk. Therefore, void space in the drums will not impact final disposal volume.

37. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.0 Pg #: General Comment Line #: Code: C
Original Comment #:
Comment: The PCDF is referred to as PCDF throughout the entire document except this section where a specific PCDF (Envirocare) is identified. Update the document to be consistent.

Response: The document will be revised to specifically identify Envirocare of Utah, Inc. as the PCDF.

38. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.0 Pg #: 2 of 3 Line #: 13-16 Code: C
Original Comment #:
Comment: Why is scabbling of the interior surfaces not being considered for removal of fixed contamination?

Response: Due to the uncertain structural integrity of Silo 3 and the project objective not to adversely impact the Silo structure, scabbling will not be used. Decontamination to meet the "visibly free from Silo material" criterion will be adequate to meet the Waste Acceptance Criteria (WAC) for the FEMP Onsite Disposal Facility.

39. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Pg #: General Comment
Line #: Code: C

Original Comment #:
Comment: The section lacks sufficient detail on how IEMP will be integrated with this project. Is there a need for supplemental monitoring?

Response: Environmental monitoring in support of the Silo 3 Project is detailed in the Silos Project Environmental Monitoring Plan, included as Appendix D of the RD Package. As discussed in Appendix D of the RD Package, the current site-wide Integrated Environmental Monitoring Plan (IEMP) monitoring network will be enhanced to address emissions from the Silo 3 project. These enhancements include relocation of three present radon monitors, and the addition of five new radon monitoring locations. The data from these radon monitors will continue to be reported through the IEMP reports.

In addition to the enhancements to the IEMP monitoring program, project-specific stack monitoring for both particulates and radon is included in the Silo 3 project design. As discussed in Section 4 of the Silos Project Environmental Monitoring Plan, these results will be maintained and reported at the project level but will be incorporated into the IEMP reports as required to quantify the nature or extent of releases or to explain changes in site-wide monitoring data.

The following text will be added to the end of Section 2.1 of the Operational Environmental Control Plan "As detailed in Section 3.1 of the Fluor Fernald, Inc. 'Silos Project Environmental Monitoring Plan' (RD Package Appendix D), monitoring and reporting of emissions from the Silo 3 Project will be accomplished through a combination of enhancements to the current site-wide Integrated Environmental Monitoring Plan (IEMP) monitoring network and project-specific stack monitoring. "

40. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Pg #: General Comment Line #: Code: C 3198
Original Comment #:
Comment: The section also need to include isopleths of modeled air plumes for radon and particulate.

Response: Figures depicting isopleths of radon and particulate concentrations in the Silo 3 Project area are attached.

41. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Pg #: General Comment
Line #: Code: C
Original Comment #:
Comment: Stack limits for radionuclides including radon need to be established.

Response: Table 2.1-1 documents the emissions estimated to result from operation of the Silo 3 Stabilization Facility at maximum capacity with the Best Available Technology (BAT) emission controls in operation. This table estimates the particulate emissions resulting from maximum-capacity operation to be 2.31μg/m^3. CAP-88 modeling calculates a maximum effective dose equivalent (EDE) to an offsite receptor from this level of emissions from the Silo 3 stack to be 3 x 10^{-4} mrem/yr, which is 0.003% of the NESHAP Subpart H standard.

Table 2.1-1 identifies estimated radon emissions from operation of the Silo 3 Stabilization Facility at maximum capacity of 653 pCi/l. Dispersion modeling predicts that this level of radon emissions will result in a maximum annual average fence-line radon concentration of 0.003 pCi/l. This concentration is 0.6% of the 0.5pCi/l criterion.

Proposed operating setpoints for the stack alarms are discussed in the Process Control Plan and in the response to OEPA Comment No. 20.

42. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Pg #: 3 of 17 Line #: 3-15 Code: C
Original Comment #:
Comment: The initial establishment of air flow that will result in an unabated release of radon from the headspace of Silo 3 should be modeled with an appropriate short-term model to estimate any off-site impacts that may arise.

Response: As stated in the Operational Environmental Control Plan, the flow from the Silo 3 headspace to the HVAC system during this initial establishment of air flow will be closely metered such that the radon concentration at the stack exhaust will not exceed the maximum emission level estimated steady state operations (653 pCi/l). The maximum hourly average fence line impact due to this level of emissions is 0.21 pCi/l.

43. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Pg #: 5 of 17 Line #: 28-38 Code: C
Original Comment #:
Comment: What suite of radionuclides were used for the dose estimate?

Response: The radionuclides used in the emission modeling, as well as their as well as their activity fractions and resulting estimated release, are identified in the table attached to this comment response.

44. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 Pg #: 6 of 17 Line #: 1 - 4 Code: E
Original Comment #:
Comment: These lines were repeated from the previous page.

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Response: Text will be corrected as noted.

45. Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.0 App. A Pg #: 10 Line #: Code: C
Original Comment #:
Comment: Some of submicron particulate present in Silo 3 will pass through the stack filter system and into the atmosphere. Will the filters for the isokinetic sampler be able to capture the submicron filters?

Response: The removal efficiency of the HEPA / ULPA filters utilized in the Silo 3 Off-gas Treatment System is certified at the industry standard "most penetrating particle size" – 99.97% @0.3μ for the HEPA and 99.99% @ 0.12μ for the ULPA. Although it is true that the removal efficiency varies with particle size, conservative assumptions regarding the impact of the particle size distribution of the Silo 3 material on the overall collection efficiency of the off gas filter system were used to calculate the estimated particulate air emissions documented in the Point Source Air Emission Study (RD Package Section 5, Appendix A). The calculation of the estimated maximum effective dose equivalent (EDE) to an offsite receptor due to emission of particulates not captured by the off-gas filter system assumes that the entire particulate emission steam, including all sub-micron particles, is respirable. The maximum annual EDE to an offsite receptor, from the controlled particulate emissions from the Silo 3 facility is 3×10^{-4} mrem/yr, which is 0.003% of the NESHAP Subpart H standard.

Similar to the off-gas filters, the collection efficiency of the stack sampler filter varies with particle size, and some fraction of the submicron particles will pass through the filter. Given the impact of these particles on the overall radionuclide emissions, as well as the fact that the maximum emissions from the Silo 3 stack produce an impact several orders of magnitude below the applicable dose standard, the radionuclide emissions measured by the stack sampler will adequately characterize the actual emissions in order to demonstrate that predicted emission levels are being met.

U.S. EPA COMMENTS ON
SILO 3 REMEDIAL DESIGN PACKAGE

GENERAL COMMENTS

- 3198

1. Commenting Organization: U. S. EPA Commentor:
Original General Comment #: 1
Section #: Not Applicable (NA) Pg #: NA
Line #: NA

Comment: The document should include process and instrumentation drawings (P&ID) showing how the entire treatment process will be controlled and monitored. The text often refers to these missing drawings. Without the P&IDs, evaluation of the Silo 3 remedial design is difficult. In addition, the flow diagrams included do not show how each system's operating pressures and flow rates are maintained. The document should include this information for the proposed control system.

Response: Comment acknowledged. Piping and Instrumentation Diagrams (P&ID) for the Silo 3 Project are attached to this comment response document. These P&ID's illustrate control and monitoring of critical parameters, including operating pressures and flow rate, for the Silo 3 treatment process.

2. Commenting Organization: U. S. EPA Commentor:
Section #: NA Pg #: NA
Line #: NA

Original General Comment #: 2
Comment: The document omits text. For example, the first paragraphs on pages 5 and 6 of Section 5.0 are obviously incomplete. The document should be carefully reviewed and revised to include the missing text.

Response: Comment acknowledged. The text on pages 6 and 6 of Section 5.0 has been corrected. The remainder of the Remedial Design Package has been thoroughly reviewed and corrected as necessary.

SPECIFIC COMMENTS

PROCESS DESCRIPTION – SECTION 2.1

3. Commenting Organization: U. S. EPA Commentor:
Section #: 2.3 Pg #: 4
Line #: NA

Original Specific Comment #: 1
Comment: The text states that the conveyance system air blower (11-BL-001) will discharge air through a chilled water coil. Following the chiller, the air stream is split, with one stream going back to the silo and the other stream going into heating, ventilation, and air conditioning (HVAC) System 75. Appendix A, Drawing No. 55-2000, indicates that System 75 is an off-gas baghouse and not an HVAC system as stated in the text. This discrepancy should be resolved

Response: System 75 is the Off-Gas Treatment System HVAC system. Text will be modified to clarify.

3198

4. Commenting Organization: U. S. EPA Commentor:
Section #: 1.4.1 Pg #: 8
Line #: NA

Original Specific Comment #: 2
Comment: The text in the table indicates that the emergency shutdown sequence will not be initiated until the silo air pressure reached +0.5 inch water gauge. However, the "Operational Environmental Control Plan" notes that the silo headspace is known to contain elevated radon concentrations of more than 200,000 picocuries per liter. The shutdown setpoint should be lowered to approximately zero to minimize the possibility of a significant radon release from the silo. Similar considerations apply to other locations that could emit large quantities of radon.

Response: The headspace radon concentration referenced in the comment represents the current concentration prior to accessing the silo and establishing flow to the HVAC system. The Process Control Plan will be revised to reflect an pressure setpoint of 0 during the initial penetration of the Silo. After the initial establishment of flow to the HVAC system, the radon concentration will be quickly reduced to a much lower steady-state level.

The allowable range of –2.0 to +0.5 inch WG during retrieval operation was specified in the Silo 3 Contract based upon structural analysis of the silo. The nominal operating limit is 0.0 inch WG. During normal retrieval operations, the silo pressure will be maintained between –2.0 and +0.0 inches water gauge differential to the atmosphere to prevent damage to the silo and minimize releases to the environment. Minor transient fluctuations above 0.0 inches of water gauge due to normal component and system operations will be allowed to avoid automatic shutdowns due to short-term minor pressure fluctuations. The control system will be programmed to allow the pressure to rise above 0.0 inches of water gauge, up to +0.2 inches, for up to 90 seconds before automatic shutdown is initiated. The Process Control Plan has been revised to clarify the control strategy for maintaining negative pressure in the silo during retrieval operations.

5. Commenting Organization: U. S. EPA Commentor:
Section #: 1.4.1 Pg #: 8
through 10 Line #:
NA

Original Specific Comment #: 3
Comment: A number of P&IDs are referenced in the "Key Regulatory Parameters" tables: however, none of these drawings have been included in this document. The document should be revised to include all P&ID drawings referenced in the document.

Response: Comment acknowledged. P&IDs for the Silo 3 Project have been attached to this comment response document.

TRANSPORTATION AND DISPOSAL PLAN – SECTION 2.4

3198

6. Commenting Organization: U. S. EPA Commentor:
Section #: 1.2 Pg #: 1-2
Line #: NA

Original Specific Comment #: 4
Comment: While this Transportation and Disposal plan includes descriptions of the various transportation and disposal options, it does not specify the transportation and disposal option that will be implemented, nor does it specify the process for selecting the disposal facility and mode of transportation. The "Project Approach" section should describe the process that Fluor Fernald will follow for the timely selection of the disposal facility and mode of transportation, and ensure that shipment and disposal can be performed promptly as stabilized material is generated.

Response: The text will be revised to indicate the preferred commercial disposal facility (Envirocare Of Utah, Inc.) and mode of transportation (truck).

SAMPLING AND ANALYSIS PLAN – SECTION 3.0

7. Commenting Organization: U. S. EPA Commentor:
Section #: 2.2.6 Pg #: 2-6
Line #: NA

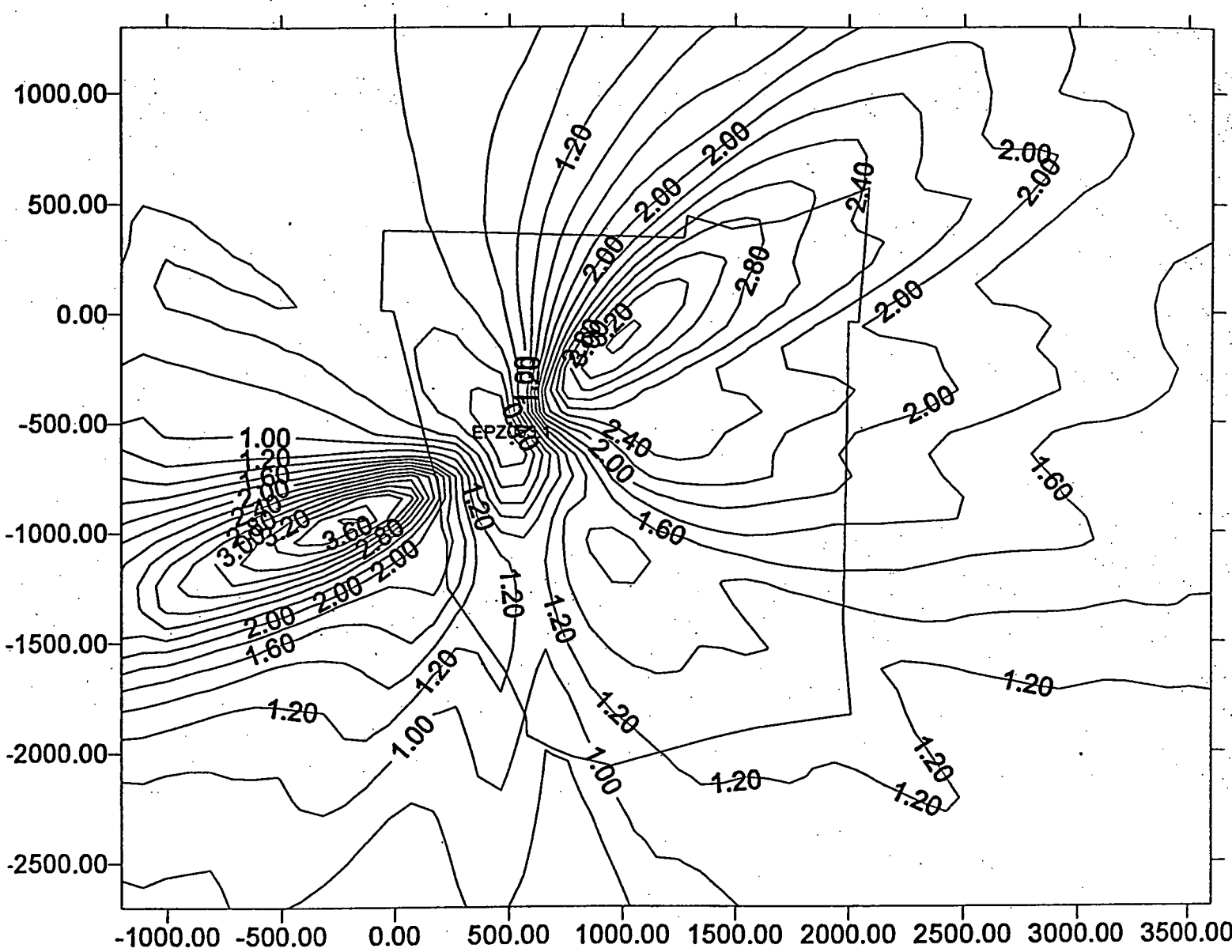
Original General Comment #: 5
Comment: The text states that the daily sample from an expected output of approximately 120 drums will be composited from grab samples taken from the 40th, 80th, and 120th (or last of the day) drums. However, such composite samples will be biased towards the conditions and performance of later parts of each day's run. The proper sampling practice would be to select a random integer "n" between 1 and 40 each day. The grab samples would then be collected from the nth, nth + 40, and nth + 80 drums. If experience shows that a day's output is usually less than 110 drums or more than 130 drums, the number "40" should be adjusted appropriately. A sample selected this way would be more representative of each day's run. The text and Figures 2-1 and 2-2 should be modified accordingly.

Response: Agree. The text will be revised to read: "To determine the efficiency of the treatment process, grab samples will be collected from three drums and composited for analyses. The initial drum number will be randomly selected from the first 40 drums of treated waste generated per day (e.g., drum number 17); the remaining two drums selected for sample collection will be the 40th drum generated after the initial drum (e.g., 17 + 40 = the 57th drum) and the 80th drum generated after the initial drum (e.g., 17 + 80 = the 97th drum)

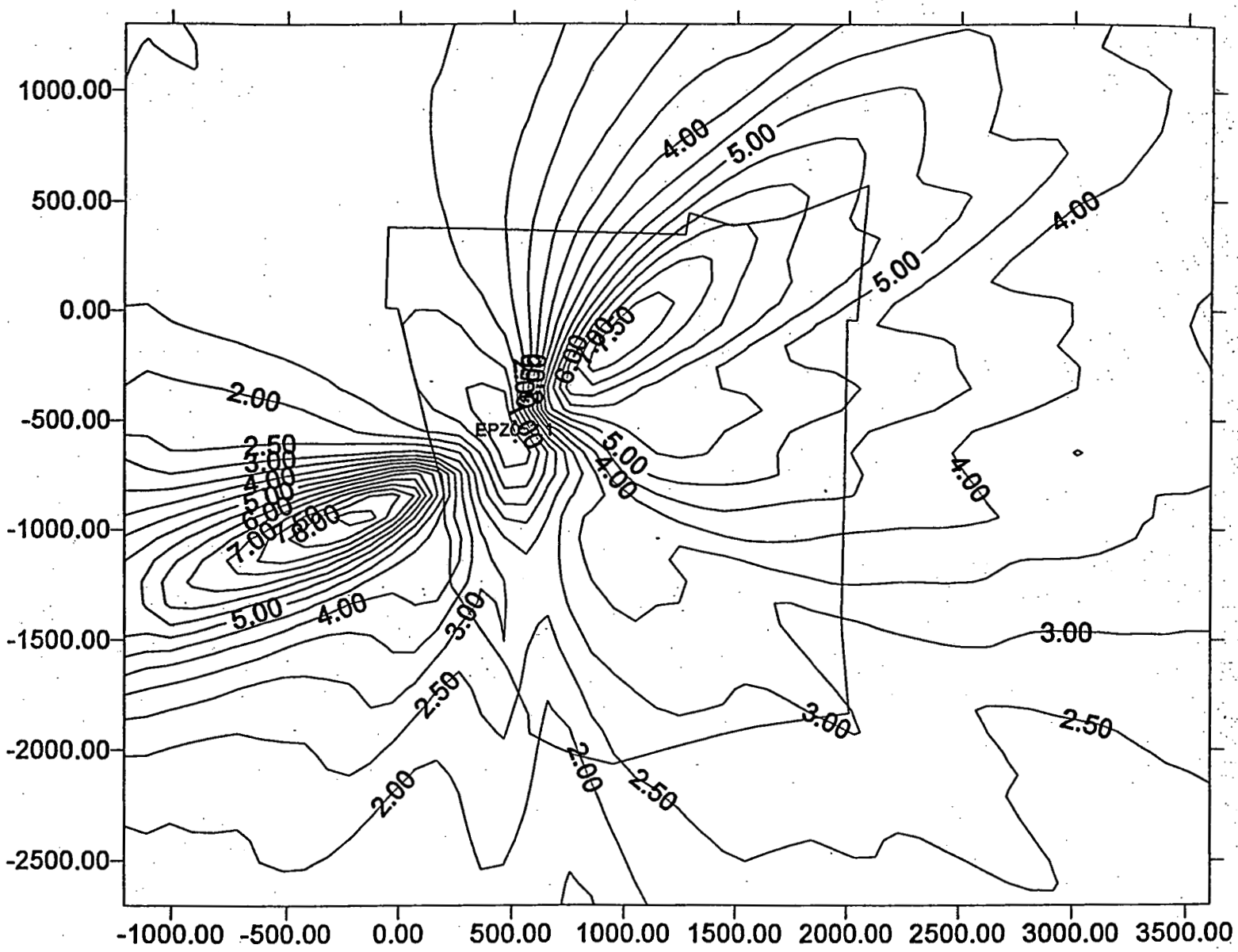
In addition, if the resulting composite analyses indicates a failure, material collected from each of the three drums originally composited will be analyzed individually to determine which fraction of the treated waste must be reprocessed."

RESPONSE TO OEPA COMMENT No. 40

ISOPLETHS OF RADON AND PARTICULATE CONCENTRATIONS



SILO 3 - RADON ISOPLETHS (x1000)
MAXIMUM ANNUAL AVERAGE RELEASE RATE
(divide above values by 1000 to obtain actual values)



SILO 3 - RADIONUCLIDE PARTICULATE ISOPLETHS
MAXIMUM ANNUAL AVERAGE RELEASE RATE
(divide above values by 10e+06 to obtain actual values)

RESPONSE TO OEPA COMMENT No. 43

INPUT DATA FOR RADIONUCLIDE DISPERSION MODELLING

Nuclide	Activity Fraction	95% UCL Specific Activity	Total Activity Processed (Amount available for instantaneous release)	Annual Unmitigated Stack Release
		(pCi/g)	Ci	Ci
Rn-219	0.0081083	925	3.35E+00	
Rn-220	0.003217	367	1.33E+00	
Rn-222	0.0339234	3870	1.40E+01	
Total Radon	0.0452487	5162	18.72	9.05
Ac-227	0.0081083	925	3.35E+00	2.85E-04
Ac-228	0.0035589	406	1.47E+00	1.25E-04
Bi-210	0.0305048	3480	1.26E+01	1.07E-03
Bi-211	0.0081083	925	3.35E+00	2.85E-04
Bi-212	0.003217	367	1.33E+00	1.13E-04
Bi-214	0.0339234	3870	1.40E+01	1.19E-03
Fr-223	0.0001119	12.765	4.63E-02	3.93E-06
Pa-231	0.0054961	627	2.27E+00	1.93E-04
Pa-234	2.496E-05	2.848	1.03E-02	8.78E-07
Pa-234m	0.015603	1780	6.45E+00	5.49E-04
Pb-210	0.0305048	3480	1.26E+01	1.07E-03
Pb-211	0.0081083	925	3.35E+00	2.85E-04
Pb-212	0.003217	367	1.33E+00	1.13E-04
Pb-214	0.0339234	3870	1.40E+01	1.19E-03
Po-210	0.0305048	3480	1.26E+01	1.07E-03
Po-211	2.214E-05	2.52525	9.16E-03	7.78E-07
Po-212	0.003217	367	1.33E+00	1.13E-04
Po-214	0.0339234	3870	1.40E+01	1.19E-03
Po-215	0.0081083	925	3.35E+00	2.85E-04
Po-216	0.003217	367	1.33E+00	1.13E-04
Po-218	0.0339234	3870	1.40E+01	1.19E-03
Ra-223	0.0081083	925	3.35E+00	2.85E-04
Ra-224	0.003217	367	1.33E+00	1.13E-04
Ra-226	0.0339234	3870	1.40E+01	1.19E-03
Ra-228	0.0035589	406	1.47E+00	1.25E-04
Th-227	0.0081083	925	3.35E+00	2.85E-04
Th-228	0.006548	747	2.71E+00	2.30E-04
Th-230	0.5276974	60200	2.18E+02	1.86E-02
Th-231	0.0010256	117	4.24E-01	3.61E-05
Th-232	0.0073808	842	3.05E+00	2.60E-04
Th-234	0.015603	1780	6.45E+00	5.49E-04
Tl-207	0.0081083	925	3.35E+00	2.85E-04
Tl-208	0.0023527	268.3971	9.73E-01	8.27E-05
U-234	0.0151647	1730	6.27E+00	5.33E-04
U-235/236	0.0010256	117	4.24E-01	3.61E-05
U-238	0.015603	1780	6.45E+00	5.49E-04

		Unmitigated	Mitigated
Maximum Continuous Radon Production Rate	Ci/hr	1.06E-01	1.06E-01
Operating Hours	hours	509.6	509.6
Total Mass Released	g	308241.54	31.99
Radon Released	Ci	9.05	9.05
Q (Radon)	Ci/hr	1.78E-02	1.78E-02

		Unmitigated	Mitigated
Volumetric Flow	ft³/min	16,003	16,003
General Radiation	pCi/l	6.00E+00	1.04E-03
Radon Radiation	pCi/l	653.36	653.36
Total particulate	g/l	2.22E-05	2.31E-09
µg/m³ =		22243.88	2.31

Total	Particulate	108918.5354	pCi/g
	Radon	5162	pCi/g
	All	114080.5354	pCi/g
	All	4.13646E+14	pCi

Notes: 1) Total activity based on a total waste mass of 7,986,600 lbs

000023

000016

PAGE CHANGES TO PROCESS DESCRIPTION DOCUMENT

RD PACKAGE SECTION 2.1

FERNALD SILO 3 TREATMENT PROCESS PROCESS DESCRIPTION

- 3198 -

1.0 OVERALL REVIEW

1.1 Overview

The purpose of this document is to provide a description of the Silo 3 treatment process as depicted on Process Flow Diagrams (PFD) 55-2000, 55-2001, 55-2008, 55-2010, and 55-2018. The Silo 3 retrieval and treatment system control philosophy is discussed in the Process Control Plan (RMR-0445-ENG-012). The purpose of the Silo 3 Project is to retrieve and treat 11(e)(2) by product material (cold metal oxides) from Silo 3 located at the DOE Fernald site. The Silo 3 material will be retrieved, conveyed, treated, and packaged to meet the Silo 3 Material Waste Acceptance Criteria (WAC).

The Silo 3 retrieval and treatment system is a continuous process, which is controlled by the Treatment System Programmable Logic Controller (PLC), with input from the Retrieval System PLC and the Packaging System PLC. In general the control philosophy for the treatment process will be operator initiated sequences controlled by interlocks. The material in Silo 3 is a dry powder and will be transferred from the silo to the treatment system via a vacuum transfer system. The Silo 3 material will be mixed with Envirobond, a reducing agent and water in a continuous mixer. The Silo 3 material mixture will be formed into briquettes and packaged in 55-gallon drums. The Envirobond process will allow high Silo 3 material loading resulting in overall volume reduction. Contamination control within the process is achieved by operating major pieces of equipment under a slightly negative pressure.

1.2 Silo 3 Material Retrieval / Conveyance System (Systems 10 &11)

The Silo 3 Material Retrieval System (System 10) and Conveyance System (System 11) consists of a mechanical arm to retrieve the Silo 3 material and a vacuum conveyance system to transport the Silo 3 material to the Treatment System. A gantry will be constructed over Silo 3 to support the Retrieval System and provide a work/service platform. The retrieval mechanical arm will use end effectors to mobilize the Silo 3 material and deploy the conveyance vacuum system. The vacuum system piping will be double contained between the retrieval enclosure and the Treatment Facility. The conveyance vacuum system is connected to the silo HVAC System (System 75). The Silo 3 material will be transferred from the silo and separated from the transport air by a filter receiver and mechanically conveyed to the Silo 3 Material Feed Hoppers.

1.3 Treatment System (Systems 16, 17, 23, 44, & 62)

The Silo 3 Material Treatment System consists of a Processor Feed System (System 16), Processor System (System 17), Product Forming System (System 23), Product Additive System (System 44) and a Radioactive Liquid Waste System (System 62). The Silo 3 material will be metered by a loss-in-weight feed system and fed into a continuous Process Mixer. Reducing agent, binder, absorbent (if necessary), and process water will be fed to the mixer. The

2.0 RETRIEVAL / CONVEYANCE SYSTEM (Systems 10 & 11)

2.1 Overview

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The Retrieval (System 10) and Conveyance (System 11) Systems are designed to remove the Silo 3 material from Silo 3 and convey it to the Treatment Facility. Once the Silo 3 material is removed, the same system will be used to remove the loose contamination from the walls of the silo.

2.2 Retrieval System (System 10)

The Retrieval System consists of a Mechanical Retrieval Arm, controlled by the Retrieval System PLC. The arm will be fitted with various tools at the end of the arm, to mobilize the Silo 3 material for transport by the Conveyance System. The Retrieval System will enter the silo through the center access port on top of the silo dome. This same mechanical system will be used to remove residue from the silo walls. For a more complete description of the Silo 3 Retrieval System, refer to the "Retrieval Technology Description" document (RMR-0445-ENG-03).

2.3 Conveyance System (System 11)

The Conveyance System, depicted on PFD 55-2000, is a pneumatic conveying system, driven by a Positive Displacement (P/D) Blower (11-BL-001). Ambient make-up air is brought into the Retrieval Enclosure to be utilized for the Conveyance System. The P/D Blower creates a vacuum, which enables the transfer of the Silo 3 material to the Treatment System via double contained piping instrumented for leak detection. In the Treatment Facility, a Filter Receiver (11-ME-001) will separate the Silo 3 material from the air stream. From the Filter Receiver, the Silo 3 material will be gravity fed into a Rotary Valve (11-VA-001). The Silo 3 material will drop out of the Rotary Valve, and into the Processor Feed System (System 16). The air stream leaves the Filter Receiver (11-ME-001) and passes through the P/D Blower (11-BL-001). As a result of transporting the Silo 3 material, the temperature of the air discharged from the Blower will be elevated. The air will be cooled by the Chilled Water Coil (11-HE-001). Following the chiller, the air stream is split into two streams: one stream will recycle back to the silo, and the other stream will go into the Off-Gas Treatment HVAC System (System 75) to help maintain a negative pressure on the silo and Retrieval Enclosure.

The P/D Blower (11-BL-001) will be used to convey the Silo 3 material and also place the silo under negative pressure during operation. Air flows through a HEPA filter into the Retrieval Enclosure then into the silo due to negative pressure placed on the silo by the P/D Blower (11-BL-001). On the off-shift the negative pressure is achieved by the Off-Gas Fan (75-FA-001).

3.0 TREATMENT SYSTEM (Systems 44, 16, 17, 23, 62)

3.1 Overview

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The Silo 3 Material Treatment System is composed of five sub-systems: Product Additive System (System 44), Processor Feed System (System 16), Processor System (System 17), Product Forming System (System 23), and the Radioactive Liquid Waste System (System 62). The Product Additive System (System 44) will store the binder and reducing agent in reusable totes outside and convey the additives by screw conveyors to the Processor Feed System (System 16). The Silo 3 material and additives will be metered into the Mixer Feed Conveyor and then gravity fed into the Process Mixer (System 17). Process water will be metered into the mixer via the Process Water Pump (System 62). The ratio of all material added to the mixer will be controlled by the Treatment System PLC. All the feed streams to the Mixer Feed Conveyor are dry powders, thus the two inlets to the Process Mixer a powder mixture, and process water. The material discharged from the Process Mixer will be introduced into the Product Forming System (System 23). The Product Forming System reduces the volume of Silo 3 material by forming it into briquettes. The briquettes will be conveyed to the Packaging System (System 24). Periodically, the Process Mixer will be cleaned with plant water. The wash water will then be collected and used to process Silo 3 material.

3.2 Product Additive System (System 44)

The Product Additive Bulk Storage System receives and transfers bulk feed materials (e.g. Envirobond) used in the Silo 3 material stabilization process and is depicted on PFD 55-2001. The system consists of totes and conveyors. Both the binder and the reducing agent will be stored outside of the Treatment Facility in reusable totes. Both binder and reducer will be stored in separate totes, there will be two tote feed systems for binder and two tote feed systems for reducer.

The binder is Envirobond, a phosphate based stabilizer, the binder will be delivered to the site in totes. A reducing agent (i.e. ferrous sulfate) is needed to aid in the stabilization of metals (i.e. chromium) which are present in the Silo 3 material. The reducing agent will also be delivered to the site in totes. Each tote (both binder and reducing agent) will have the capacity to support approximately one day of treatment operations. Additional six totes of each material will be stored near the treatment facility, resulting in an 8-day supply on hand.

The Treatment System PLC will control the amount of binder and reducing agent proportionally added to the system by a loss-in-weight feed system based on weight of Silo 3 material added from the Silo 3 Processor Feed System (system 16). If required due to high moisture content of the Silo 3 material, absorbent (i.e. bentonite) will be introduced into the system in the same manner as the other two additives, through its own system of totes and conveyors. As high moisture is not expected in the Silo 3 material the absorbent tote feed system will not be installed unless moisture levels are seen to be increasing as the Silo 3 material is being processed.

The binder and the reducing agent are fed to the Processor Feed System (System 16) by a series of conveyors. The Envirobond exits the Binder Tote and then enters the Binder Conveyor (44-

5.0 REJECT MATERIAL SYSTEM (System 26)

3198

5.1 Overview

Product Samples will be taken by the Product Sampler (84-PE-002) from the Product Surge Hopper (24-BN-001). Product Samples will be taken at a frequency as determined by the Fluor Fernald Sampling and Analysis Plan For Silo 3 treated Waste Material (40420-PL-0001), contained in Section 3.0 of this Remedial Design Package. During the time of analysis, the product drums will be stored in the Interim Storage Area (ISA) adjacent to the East Side of the Treatment Facility. If a set of sample results do not meet the Waste Acceptance Criteria (WAC) requirements, the lot of drums must be reprocessed by the Reject Material System (System 26) as described on PFD 55-2018. Reject material will be reprocessed after all of the Silo 3 material has been treated. Design and details of the ISA are provided in the Site Preparation Package documentation.

5.2 Reject Material Handling

If product samples fail to meet the WAC, the affected drums will be removed from the Interim Storage Area and returned to the Treatment Facility for reprocessing. The drums of reject material will be brought to the Treatment Facility by the Pallet Forklift (24-ME-002) and moved to the Pallet Unloading Station using the Pallet Mover (24-ME-003). After the pallet bands have been removed, the Jib Crane (26-CN-001) will lift the drums off the pallet and place them on the Reject Drum Conveyor (26-CY-002) outside of the Treatment Facility. The drums will be conveyed into the Treatment Facility where the drum lid will be removed at the Delidding / Lidding Station (26-ME-003). The drum will then be conveyed to the Drum Unloader Conveyor (26-CY-005) at the Drum Unloader (26-ME-002).

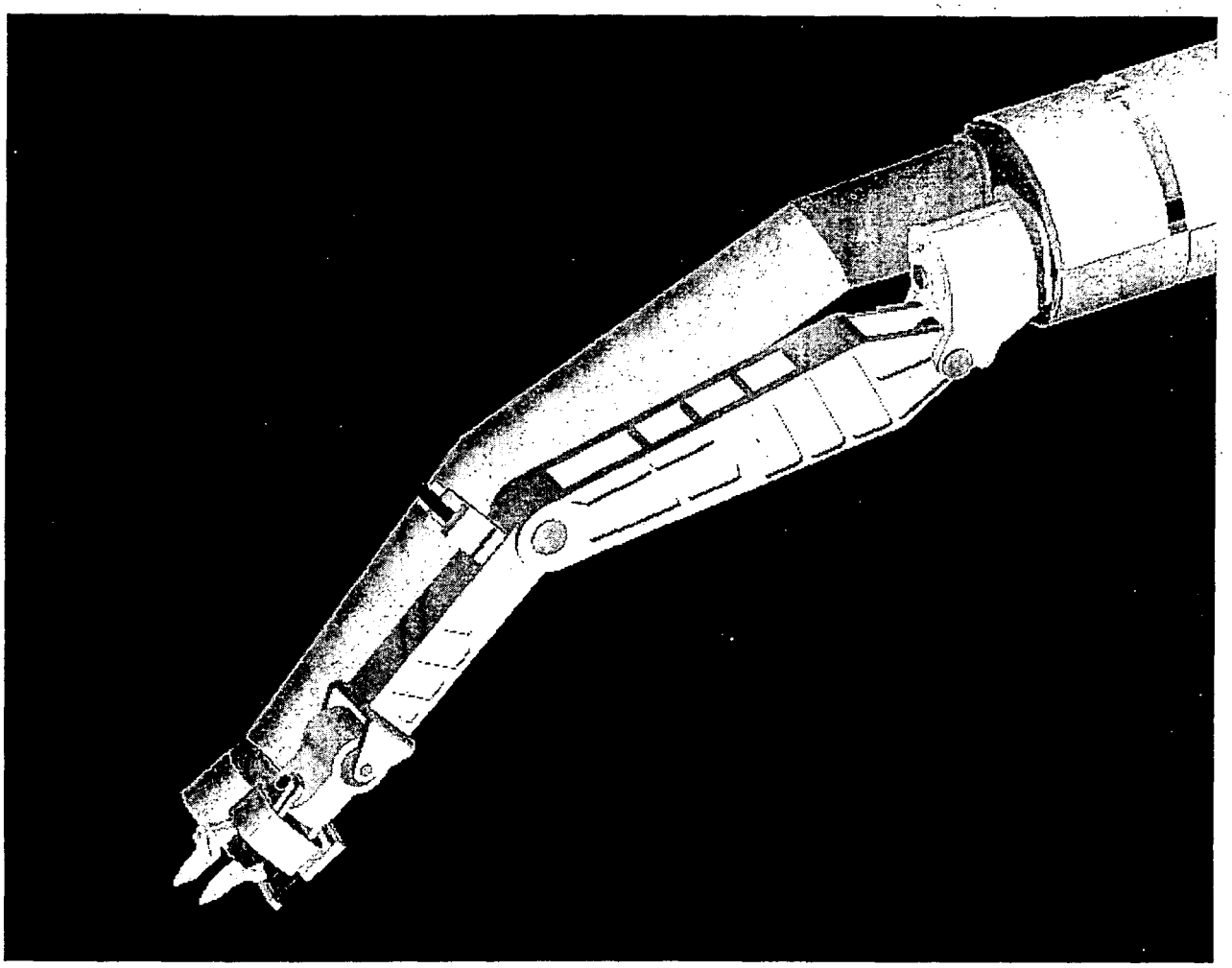
5.3 Reject Material Processing

The Drum Unloader (26-ME-002) will empty the briquettes from the drum into the Reject Hopper (26-BN-001) via the Reject Screw Conveyor (26-CY-003). The Reject Hopper (26-BN-001) will act as a surge hopper for the Reject Crusher (26-ME-001) to smooth the reject reprocessing operation. The material will flow from the Reject Hopper (26-BN-001) into the Reject Crusher (26-ME-001). The crushed reject material will be conveyed from the crusher by the Crushed Reject Conveyor (26-CY-004) to the Silo 3 Material Feed Conveyor (System 16). The reject material will be processed to meet the Silo 3 WAC requirements through the same process as the original Silo 3 material. The empty drums will exit the reject system, be smeared and cleaned as required, lids and clamp bands replaced and the drum monitored for external contamination and placed back onto pallets at the Pallet Loading Station. Drums will be re-labeled as "empty - fixed contamination."

PAGE CHANGES TO RETRIEVAL TECHNOLOGY DESCRIPTION

RD PACKAGE SECTION 2.2

Exhibit 4.1-4: Kraft Slave Arm with 8-in. Hose and Retractable Nozzle 3198.



The segmented mast, that supports the arm, will consist of one to seven links. Each link will be ten ft. long and 17 in. in diameter (Exhibit 4.1-5). The average link weight will be less than 500 lbs. with individual hoses and cylinders attached. Cylinders will be hinged down one side in a piano-type hinge arrangement and hoses will be secured with a series of latches down the other side. The piano-type hinge will permit the segments to be opened for assembly around the conveyance system tube and the hydraulic hoses for the arm and lower extension segments. The segments will attach to each other with a pivot pin on one side and will be actuated with a hydraulic cylinder on the other side. The hydraulic umbilical hose will contain connection points appropriately spaced along its length, so that each extension segment can be connected as it is added to the assembly.

4.3 ReTRIEVR Tool Change

2198

There are two methods to change or add the ReTRIEVR arm tooling. The preferred method is to use the Tool change enclosure located at the auxiliary Silo 3 opening and the to introduce tooling into the silo for remote hand-off to the Raptor arm gripper. This can only accomplished after 4 link masts have been added to the ReTRIEVR arm. Personnel will wear appropriate PPE to perform tool changes at the sealed Tool change enclosure, using long reach poles to lower the tool into the silo for Raptor gripper pick-up and attachment. The enclosed auxiliary Silo 3 Port will be accessible from the gantry structure.

The second method to change the ReTRIEVR arm tooling is by retracting the ReTRIEVR into the confinement enclosure. Next, the tooling will be changed or added manually. To change tooling manually, personnel will enter the confinement enclosure wearing appropriate PPE. They will manually vacuum the outside mast of the ReTRIEVR when removing the masts from Silo 3. The insides of the links may be vacuumed after the links are opened and on the storage racks. Therefore, manual changing of the remote tooling will be minimized. Manual changing will include both changing tooling for function, wear, maintenance, or decontamination.

4.4 Silo 3 Debris Removal

Debris removal techniques vary depending on the type and quantity of debris encountered in the Silo. Debris removed will be package and disposition dependent on characteristics of the specific debris. There are three debris removal methods available to remove debris and are listed below. The preferred method is to retrieve debris through the Tool Change Enclosure located at the auxiliary port:

a. Lower a bucket and/or net into Silo through the sealed Tool Change Enclosure at the auxiliary port and allow ReTRIEVR to grip the debris and place it in the bucket or net. Remove the bucket/net through the Tool Change Enclosure for bag out.

b. Lower a hook into Silo through the sealed Tool Change Enclosure at the auxiliary port and allow ReTRIEVR to grip hook and attach it to the debris. Remove the hook and debris through the Tool Change Enclosure for bag out.

c. Have ReTRIEVR grab and hang-on to the debris while arm is being extracted from the Silo through enclosure. Decontaminated arm as it is removed from silo. Bag out debris in enclosure.

4.5 ReTRIEVR Decontamination Methods

Decontamination of the retrieval arm is required whenever the arm is removed from the silo. Personnel wearing appropriate PPE will enter the enclosure and manually use HEPA vacuum to vacuum the outside mast of the ReTRIEVR when removing the masts from Silo 3. Wipes and brushing may be used to assist in the decontamination. The insides of the links may be vacuumed and wiped after the links are opened and on the storage racks inside the enclosure. To maintain containment during