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**R-002-207.5**

**REMOVAL #1 - PLANT 2/3 AND 9  
U.S. DOE FERNALD  
OH6 890 008 976**

**06/12/90**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

230 SOUTH DEARBORN ST.  
CHICAGO, ILLINOIS 60604

JUN 12 1990

REPLY TO THE ATTENTION OF:

5HR-12

Mr. Bobby Davis  
United States Department Of Energy  
Feed Materials Production Center  
P.O. Box 398705  
Cincinnati, Ohio 45239-8705

Re: Removal #1 - Plant 2/3 and 9  
Feed Materials Production Center  
Fernald, Ohio  
OH6 890 008 976

Dear Mr. Davis:

On May 8, 1990, the United States Department of Energy (U.S. DOE) submitted a work plan to expand removal action #1, which currently involves the pumping of contaminated groundwater from under Plant 6. The proposed work plan addendum provides for expansion of the removal action to plants 2/3 and 9.

U.S. EPA comments regarding the proposal were due to U.S. DOE by Monday, June 11, 1990, but this removal action was to have been discussed at the Technical Information Exchange (TIE) meeting that was scheduled for June 12, 1990. On June 5, 1990, U.S. DOE requested to postpone the TIE meeting until June 28, 1990. In light of U.S. DOE's request and the timing of our next scheduled meeting, U.S. EPA is presenting written comments on the work plan.

The following deficiencies have been identified in the work plans.

GENERAL COMMENTS

1. The work plans should reference removal #1 and the Consent Agreement.
2. The work plan needs to include procedures for how the work will proceed if additional contaminants are found under plants 2/3 and 9, as with plant 6.
3. Since the interconnection of perched water is not understood, the contaminants from surrounding buildings should be included in the contaminant list.
4. Information collected under this removal action must be made a part of the administrative record.

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- 5. As specified in U.S. EPA's May 8, 1990, letter, the removal work plans need to include a strategy for coordination with the remedial action for the production area (operable unit #3). This strategy needs demonstrate compatibility with the remedial action, data transfer, and validation procedures. U.S. DOE needs to assure that persons responsible for operable unit #3 are involved with the removal action and the data being generated. The operable unit manager and remedial response quality assurance personnel need to review removal activities and data collection for consistency of the removal action with the final remedial action, technical adequacy, and quality of the work performed.
- 6. All work performed under this removal action needs to be in accordance with the National Contingency Plan (NCP) and current Superfund guidance.
- 7. Many issues raised by the health and safety plans were not addressed as work to be performed under the work plans.

PLANT 2/3

WORK PLAN COMMENTS

- 8. Section I: What is the depth of the low permeability layer that the perched water is lying on? Sample results from this layer should be presented. Has this layer adsorbed contaminants and contaminating interstitial water? Is this water migrating to underlying groundwater systems?
- 9. Section I: A cross-sectional view of the hydrogeologic units should be included.
- 10. Section I: The results of the soil sampling should be included.
- 11. Section II.1.0, page 1, paragraph 1: It is not clear what is meant by the statement "so that penetration through the cover soil does not occur." This statement should be further explained.
- 12. Section II.4.0, page 2, paragraph 6: The proposal for pumping groundwater and transferring it to existing wastewater treatment units fails to include estimates of volume, pumping rates, and contaminants that are to be removed during treatment. Details of the monitoring/metering systems, start/stop controls, provisions for manual override, and treatment techniques should be provided. Since volatile organic compounds (VOCs) were detected in the Plant 6 pumped water, which necessitated the stoppage of pumping on April 23, 1990, the possibility of encountering VOCs and what action will be taken should also be presented.

13. Section II.4.0, page 4, paragraph 1: The types of contaminants that would be removed by the "processing" in Plant 8, specific details regarding the treatment, and treatment efficiency should be outlined.
14. Section II.4.0, page 4, paragraph 1: Inspection and testing of the adjacent existing sumps for leaks and general condition should occur prior to transferring the contaminated groundwater into them. Procedures for testing of the sumps should be presented. Additionally, alternatives to use of the sumps should be proposed in the work plan in event that testing indicates that their integrity is questionable.
15. Section II: The options of what to do is highly contaminated soils are found should be discussed in the work plan.
16. Section II: The criteria for stoppage of pumping should be presented.
17. Section III: If pumping is ever terminated, what sampling will be performed to monitor water quality from that point on. Provision for notification of work stoppage to U.S. EPA must be in accordance with notification requirements of the 1990 Consent Agreement.
18. Section V, page 4: Water samples should be analyzed for Technetium-99, since recycled uranium has been extensively refined at plant 2/3.
19. Section V, page 4: Sampling frequency must be specified. References to facility Standard Operating Procedures (SOPs) is not adequate. Procedures must be outlined in work plan.
20. Sections V and VII, pages 4 and 5: All samples should be collected and analyzed in accordance with the site's approved Quality Assurance Project Plan (QAPP). Modifications to the approved QAPP should be proposed in detail.
21. Attachment 1 (Schedule): Note 1 should define what is meant by "concentration... becomes insignificant as compared to background."

#### HEALTH AND SAFETY PLAN COMMENTS:

22. Section 3.2: The section on radiation hazards does not address the possibility that Technetium-99 may be present in the contaminated water as a result of past refinery operations of uranium.
23. Section 3.3, page 3: The list of potential contaminants should include the VOCs, if they could be present under this plant as with plant 6.

24. Section 3.3, page 3: Local background levels for suspected contaminants should be specified along with the regulatory exposure limits. If contaminants are expected to be concentrated in water, soils, or both, this should be annotated in the list of suspected contaminants.
25. Section 4.2.1 - 4.2.4, page 4: The specific type of atmospheric monitoring instrumentation for volatile inorganic and organic detection with the projected probe assemblies should be specified. The sensitivities of the selected probes and/or detection assemblies should be specified, with relative response restrictions or non-detect limitations of each assemblies.
26. Section 4.2.2, page 4: Due to the possibility of releasing radionuclides (and other hazardous substances) during the high pressure testing of the process lines, the utilization of real time monitoring for radionuclides should be used in addition to the proposed monthly wipe tests.
27. Section 4.3, page 5: The regulated exposure limits for uranium should also be presented in detector scale equivalents (either counts per minute or mRem per hour).
28. Section 4.3: The proposal for use of air concentrations in excess of 10 percent derived air concentrations (DAC) as action levels for donning respirators needs to be evaluated in accordance with the As Low As Reasonably Achievable philosophy (ALARA).
29. Sections 5.1-5.4, pages 6-9: Process coveralls are not chemical or liquid resistant. Saranex, or equivalent, is the minimum acceptable protective clothing. If concentrated process material could be encountered, a butyl rubber or heavy PVC splash suit would be an appropriate outer garment.
30. Sections 5.1-5.4, page 6-9: Inner gloves should always be used unless their usage creates an additional risk greater than the potential for contact with skin irritants. Due to the potential presence for corrosive or caustic hazardous substances, this additional layer of protection is appropriate.
31. Sections 5.1-5.4, page 6-9: Escape packs should be included on the list of the equipment list. Additionally, self-contained breathing apparatus (SCBAs) should be used during the initial phases of the investigation for better protection against radionuclides, asbestos, and chemical hazards until the working environment is fully characterized and is deemed to be stable.
32. Section 6.1.1: The posting requirements for external radiation levels are not cited.

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33. Section 6.2: The methods for estimating internal dose if bioassay action levels are exceeded needs to be presented. Internal dose due to technetium-99 needs to be addressed, if it is found to be a contaminant.
34. Sections 6.1-6.2, page 10; 8.0, page 12; 9.0, page 13: A site map delineating specific zones of proposed activity, exclusion zones, radiological control zones, and decontamination corridors should be shown. The scale and clutter of information on the site overview map does not permit effective representation of the work area.
35. Section 9.0, page 13: Decontamination procedures and stations should be specified, as well as decontamination line monitoring procedures. This information should also be represented in a diagram. The use of chemical decontamination solutions, other than soap and water, is appropriate.
36. Section 11.0, page 13: A map delineating the route to the nearest medical facility or medical assistance station should be shown in the section regarding emergency procedures. Emergency communication locations should be specified. All emergency equipment locations should also be specified on a site work map.
37. Section 12, page 15: The section regarding confined spaces should address the additional considerations for ambient monitoring and more protective respiratory safety requirements. The specific tasks to be performed in confined spaces should be outlined. Since the tasks involve disruption of process lines and containerized materials, there is a chance for greater potential hazards.
38. Attachment: A summarization of the health risks, potential exposure pathways, and practical first aid for each potential hazardous substance is more effective than full reproduction of the Material Safety Data Sheets (MSDS).

## PLANT 9

### **WORK PLAN**

39. Section I: The vertical and lateral extent of the perched water needs to be identified. Figure 1 indicates that the perched water may be localized in the vicinity of well 1324. Is this correct?
40. Section I: Is the water at 1324 perched water or does it represent a groundwater mound?
41. Section I: What is the depth of the low permeability layer that the perched water is lying on? Sample results from this layer

should be presented. Has this layer adsorbed contaminants and contaminating interstitial water? Is this water leaching to underlying groundwater?

42. Section I: A cross-sectional view of the hydrogeologic units should be included.
43. Section I: the results of the soil sampling should be included.
44. Section II.4.0, page 3, paragraph 6: A discussion regarding the expected volume of water to be pumped, type of contaminants in the water, proposed treatment techniques, and treatment efficiency, should be included. Details of the monitoring/metering systems, start/stop controls, and manual override should be provided.
45. Section II: The activities described in this section are vague. Transmissivity and hydraulic conductivity should be quantified in order to determine how effective pumping will be in relieving the hydraulic head in the perched zone and reduction of flow into the unsaturated zone.
46. Section II: Depending upon the extent of the perched zone, the amount of hydraulic head built up in the perched zone, and the hydraulic properties of the perched aquifer, more than one extraction well may be required.
47. Section II: The installation of trenches and/or drains should be evaluated.
48. Section II: Options if highly contaminated soils are found should be discussed.
49. Section II: The criteria for stoppage of pumping should be outlined. Work stoppage notification requirements should be outlined in the work plan.
50. Section III: If pumping is ever terminated, what sampling will be performed to monitor water quality from that point on?
51. Section IV.2.0, page 3, paragraph 5: Additional support should be provided for the assumption that only one collection well is required.
52. Section IV.4.0, page 3, paragraph 7: The expected rate of pumping and volume capacity of the sumps should be given. An estimate or anticipated range should be given before implementing the removal action.
53. Section IV.4.0, page 3, paragraph 7: The work plan should address where contaminated groundwater will be pumped in the event that the integrity of the adjacent sump is found to be deficient after

it is tested. Procedures for testing of the sumps should also be included in the removal work plan.

54. Section V, page 4: Sampling frequency must be specified. References to facility Standard Operating Procedures (SOPs) is not adequate.
55. Sections V and VII, page 4: All samples should be collected and analyzed in accordance with the site's approved QAPP. Modifications to the approved QAPP should be proposed in detail.
56. Attachment 1 (Schedule): Note 1 should define what is meant by "concentration...becomes insignificant as compared to background."

#### HEALTH AND SAFETY PLAN

57. Section 3.2: The statement that the thorium content in affected areas is expected to be low relative to uranium needs to be substantiated with data. Historically, thorium work did occur in plant 9 and the health impacts per unit of activity of thorium is much greater than uranium. DACs are up to 20 times lower, surface contamination limits are 5 times lower, and external radiation exposure rates are considerably higher.
58. Section 3.3, page 3: The list of potential contaminants should include the VOCs, if they could also be under this plant. This comment is also relevant to the work plan.
59. Section 3.3, page 3: Local background levels for suspected contaminants should be specified along with the regulatory exposure limits. If contaminants are expected to be concentrated in water, soils, or both, this should be annotated in the list of suspected contaminants.
60. Section 4.2, pages 3-4: The specific type of atmospheric monitoring instrumentation for volatile inorganic and organic detection with the projected probe assemblies should be specified. The sensitivities of the selected probes and/or detection assemblies should be specified, with relative response restrictions or non-detect limitations of each assemblies.
61. Section 4.2, pages 3-4: Due to the possibility of releasing radionuclides (and other hazardous substances) during the high pressure testing of the process lines, the utilization of real time monitoring for radionuclides should be used in addition to the proposed monthly wipe tests.
62. Section 4.2, pages 3-4: Surface tests and area surveys should be performed following those activities that will generate radionuclide dusts, in addition to the recommended weekly and monthly surveys.

63. Section 4.3, page 4: The regulated exposure limits for uranium should also be presented in detector scale equivalents (either counts per minute or mRem per hour).
64. Section 4.3: The selection of action levels for unspecified contaminants needs to be justified in light of possible thorium contamination. The surface limit that would require the donning of respirators is 100 times the permissible limit for thorium and the air concentration (25% DAC for uranium) is 5 DAC for thorium-232. The use of air concentration limits in excess of 10% DAC (the posting requirement) for action levels for respiratory protection needs to be evaluated in accordance with the ALARA principle.
65. Sections 5.1-5.3, pages 5-7: Process coveralls are not chemical or liquid resistant. Saranex, or equivalent, is the minimum acceptable protective clothing. If concentrated process material could be encountered, a butyl rubber or heavy PVC splash suit would be an appropriate outer garment.
66. Sections 5.1-5.3, page 5-7: Inner gloves should always be used unless their usage creates an additional risk that is greater than the potential for contact with skin irritants. Due to the potential presence for corrosive or caustic hazardous substances, this additional layer of protection is appropriate.
67. Sections 5.1-5.3, page 5-7: Escape packs should be included on the equipment list. Additionally, SCBA's should be used during the initial phases of the investigation for better protection against radionuclides, asbestos, and chemical hazards until the working environment is fully characterized and is deemed to be stable.
68. Sections 6.1, page 8; 8.0, page 10: A site map delineating specific zones of proposed activity, exclusion zones, site and radiological control zones, and decontamination corridors should be included. The scale and clutter of information on the site overview map does not permit effective representation of the work area.
69. Section 6.1.1: Posting requirements for external radiation levels are not cited.
70. Section 6.2: Bioassay work is not effective for detection/dose quantification of thorium compounds. In vivo counting is more appropriate.
71. Section 6.2: Methods that will be used for internal dose estimation if bioassay action levels are exceeded should be specified.

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72. Section 9.0, page 11: Decontamination procedures and stations should be specified, as well as decontamination line monitoring procedures. This information should also be represented in a diagram. The use of chemical decontamination solutions, other than soap and water, is appropriate.
73. Section 11.0, page 11-13: A map delineating the route to the nearest medical facility or medical assistance station should be shown in the section regarding emergency procedures. Emergency communications locations should be specified. All emergency equipment locations should also be specified on a site work map.
74. Section 12.0, page 13: The section regarding confined spaces should address the additional considerations for ambient monitoring and more protective respiratory safety requirements. The specific tasks to be performed in the confined spaces should be outlined. Since the tasks involve disruption of process lines and containerized materials, there are higher levels of potential hazard.
75. Attachments: A summarization of the health risks, potential exposure pathways, and practical first aid for each potential hazardous substances is more effective than full reproduction of the Material Safety Data Sheets (MSDS).
76. Attachments: Because of the health risks posed by the potential presence of HF in the soils, groundwater, and plant process and building structures, the chemical specific hazards should be included in Section 7. A references to standard operating procedures (SOPs) for radiation and HF exposures were referenced in Section II, but should also be included with the plan for this removal action.

The comments presented in this letter are required to be addressed prior to approval of the work plan for the expansion of removal action #1. It is U.S. EPA's desire that this removal action be expanded to plants 2/3 and 9 as soon as possible and suggests that a revised work plan be submitted before the thirty days period required by the 1990 Consent Agreement. U.S. EPA and OEPA are willing to meet with U.S. DOE and your representatives in Chicago upon your request for a meeting in order to facilitate the production of a revised work plan.

Please contact me at (312/FTS) 886-4436 if you have any questions.

Sincerely yours,



Catherine A. McCord  
On-Scene Coordinator

cc: Bruce Boswell, Westinghouse  
Maury Walsh, OEPA  
Graham Mitchell, OEPA-SWDO