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RESPONSE TO OHIO ENVIRONMENTAL PROTECTION AGENCY AND THE U. S. ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON REMOVAL ACTION NUMBER 19 - PLANT 7 DISMANTLING FINAL REPORT

07/26/95

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DOE-FN EPAS
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RESPONSES

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JUL 28 1995

DOE-1275-95

Mr. James A. Saric, Remedial Project Director
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Dear Mr. Saric and Mr. Schneider:

RESPONSE TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON REMOVAL ACTION NUMBER 19 - PLANT 7 DISMANTLING FINAL REPORT

Reference:
1. Letter, J. E. King to Johnny Reising, "Plant 7 Dismantling Removal Action 19 Design Modification," June 12, 1994
2. Letter, Thomas A. Schneider to Jack Craig, "RA 19 Proposed Enhancements - Approval," July 27, 1994
3. Letter, Thomas A. Schneider, Ohio EPA, to Jack Craig, DOE-FN, "Comments - Plant 7 Removal Action Final Report," June 16, 1995
4. Letter, James. A Saric, OEPA, to Jack. R. Craig, DOE-FN, "Removal Action 19 Final Report," June 21, 1995

In response to the Ohio Environmental Protection Agency (OEPA) and the U.S. Environmental Protection Agency (U.S. EPA) comments on the Plant 7 Dismantling Final Report, the Department of Energy, Fernald Area Office (DOE-FN) provides the following comment disposition:

Ohio EPA Comment 1:

Table 2-5 lists waste management and disposition of Plant 7 material only in terms of pounds of steel, concrete, etc. The OEPA would like to see data on the Plant 7 waste material in terms of volume (i.e., cubic yards of steel, concrete, etc.). This information is valuable since the proposed on-site disposal cell capacity will be designed in terms of cubic yards of waste.

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Also, this information will aid in determining, and verifying the volume of Operable Unit 3 (OU3) material to be disposed of in the on-site disposal cell. All future OU3 Decontamination and Decommission (D&D) projects should also list waste material in this manner.

Disposition:

Enclosed is Table 2-6 "Material Volumes Generated During Removal Action Number 19," which shows material volumes (in cubic yards) generated during Plant 7 Dismantling (Pages 2-37). To determine and verify the volume of OU3 material to be disposed of in the on-site disposal cell, future OU3 D&D project waste material volumes will be reported in cubic feet or cubic yards.

Ohio EPA Comment 2:

Section 2.6.2, Verification Soil Surveys, states that verification soil samples were to be taken during the removal action of Plant 7; however, these samples were not collected due to a change in demolition techniques. While modifications from a work plan do occur during field activities, both regulatory agencies need to be informed prior to any deviation from the approved work plan. Also, a reference should be made within the text which states the modifications to the approved work plan were condoned by the regulatory agencies.

Disposition:

After Plant 7 had been demolished and the debris had been removed from the area, low spots were resurfaced and fixative coatings were applied in areas with potentially removable contamination. A walk-over radiological survey was then conducted to verify the levels of removable contamination were below the 10 CFR 835, Appendix D, Surface Radioactivity Values of 1,000 disintegrations per minute (dpm) beta, gamma/100cm^2. As a result of the survey, approximately 90,000 ft^2 of the area surrounding the former Plant 7 structure was downgraded from Contamination Area to Controlled Area status.

In reference Letter Number 1, modifications to the Plant 7 Dismantling technique were described. The DOE agrees that more detailed information should have been added to clarify the modified sampling process. In the future, all deviations from the approved work plan will be provided to both regulatory agencies.

Text has been added to Section 2.4.4.3, Enhancements of the Plant 7 Dismantling Final Report (Pages 2-25), stating that the Fernald Environmental Management Project (FEMP) received approval from the OEPA for the approved work plan modification on July 27, 1994, (reference Letter Number 2) and from the U.S. EPA on August 4, 1994, concerning the modified demolition technique.

U.S. EPA Comment 1:

The executive summary and conclusion sections should describe the efficient and cost-effective D&D procedures used, and should highlight lessons learned for future D&D projects.

Disposition:

A table has been prepared to show the lessons learned by using the more efficient and cost effective D&D procedure during the Plant 7 Removal Action. The table is included in the Final Report Executive Summary and referenced again in Section 3.0, Conclusions. These lessons learned are being applied to other Fernald D&D activities, including Plant 1 and Plant 4.

U.S. EPA Comment 2:

The report does not describe control, collection, and sampling of wastewater generated from decontamination of Plant 7 materials. The report should contain information regarding the quantity of wastewater generated, treated, and discharged, as well as provide analytical results for wastewater samples collected.

Disposition:

The control and collection of Plant 7 wastewater was conducted by constructing a temporary dike several feet from the outside of the building wall. In addition, a strippable coating was applied to the ground floor slab, elevator pit, and sump, causing it to act as a catch basin to contain and collect the wastewater. Water collected was pumped to one of four holding tanks. Approximately 3,300 gallons of wastewater were generated (Tank 1 contained 1,100 gallons, Tank 2 contained 400 gallons, Tank 3 contained 700 gallons, and Tank 4 contained 1,100 gallons).

In October 1993, water from Tanks 1 and 2 was sampled and analyzed for pH, isotopic uranium and total metals. Results indicated metals and uranium content, and the water was sent to the FEMP Wastewater Treatment System (WWTS). In December 1993, samples were collected from Tanks 3 and 4 and analyzed for pH and total uranium prior to being sent to the WWTS for treatment. Full metal analyses were not run on the samples before the water was sent to the WWTS because it was anticipated that the water from Tanks 3 and 4, from the same source as Tanks 1 and 2, would require treatment. In summary, all 3,300 gallons of wastewater generated during the gross decontamination of Plant 7 was sent to the WWTS to be treated (see Section 2.3.2 Gross Decontamination). Analytical results from the October and December sampling events are summarized in the Enclosure as Attachment A.

Enclosed are revised copies of the Plant 7 Final Report with the OEPA and the U.S. EPA comments incorporated. If you have any questions, please contact Art Murphy at (513) 648-3132.

Sincerely,

Randy Allen

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Murphy

Enclosure: As Stated

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FIGURES

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ATTACHMENT

A Summary: Plant 7 Wastewater Analytical Results

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- Removal Action No. 17, "Improved Storage of Soil and Debris." Provides specific criteria for the improved management of contaminated soil and debris and identifies options for its disposition.

- Removal Action No. 26, "Asbestos Abatement." Includes procedures used at the FEMP for identifying, isolating, removing/packaging, shipping and disposing of wastes containing asbestos.

ES.3 CONCLUSIONS

The objective of Removal Action No. 19 was to eliminate the potential for release of radiologic contaminants from Plant 7 and to dismantle it to grade level. As detailed in this final report, this objective was accomplished in a safe, efficient, and cost-effective manner. Removal Action No. 19, the first major D&D at the FEMP, was completed ahead of schedule and set a precedent for the efficient and timely removal of other structures at the FEMP site.

Consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Removal Action No. 19 contributed to the efficient performance of projected final remedial actions at the FEMP. The goals of the FEMP in conducting Removal Action No. 19 were to minimize the potential for releases of contaminants, and to conduct the action in a cost efficient and safe manner consistent with site Standard Operating Procedures (SOPs) and worker health and safety requirements. These goals were achieved.

The more efficient and cost effective Decontamination and Dismantlement (D & D) procedures used as part of the modified Plant 7 Removal Action are described in Table ES-1, Plant 7: Lessons Learned. These lessons learned are being applied to other FEMP D & D activities, including Plant 1 and Plant 4.

Table ES-1
Plant 7: Lessons Learned

Improvement	Comparative Descriptions
Implosion of Buildings	New Method - Attach shaped charges and implode steel structure, cut steel structure to specific lengths using mechanical shears. Benefit: reduction of time (overall schedule is accelerated, less man-hours (high altitude work minimized). Old Method - Modular removal methods require more time and rigging costs.
Cutting Key Structural Members and "Pull Over" (Smaller Structures)	New Method - Best method for single level building with structural steel frame. Benefit: reduction in time to dismantle structure. Old Method - Modular removal methods require more time and rigging costs.
Improved Techniques for the Removal of Friable Asbestos (applicable to all structures)	New Method - Construction of a large local containment structure within a building to remove piping asbestos. Benefit: saves material, and reduces labor and cost. Old Method - Build many small containments around groups of pipe to perform asbestos abatement in piecemeal fashion.
Improved Techniques for the Removal of Elevated Concrete	New Method - Removal of suspended slabs in upper floors of a structure by wrapping slabs with dust control material and dropping the concrete with the steel structure using implosion methods. Benefit: less material handling and potential for exposure to physical, and potential chemical and radiological hazards. Old Method - Remove floors of structure using saw cutting methods and rigging the slabs out of the building in small sections.
Load Structural Steel in Roll-Off Boxes	New Method - Cut material into small enough pieces to allow loading into containers, tarp and move to temporary storage area to await disposition determination. Benefit: many container handling steps and rigging are eliminated. Old Method - Remove lid, prepare shipping container, load material in large pieces, replace lid, weigh container.
Use of a Motorized Work Platform (applicable to all structures)	New Method - A motorized platform used to transport people and materials at the same time. Benefit: less equipment costs. Old Method - Use a man-lift and crane to remove each transite panel.
Improved Material Handling	New Method - Bundle cut materials on pallets and move bundles with cranes or pallet carts. Benefit: reduced material handling costs for demolition debris. Old Method - Remove cut materials and move each component piece-by-piece to waste container.
Siting of Waste Container Queuing Area Closer to Project	New Method - Place waste containers as close to work area as possible. Benefit: reduces time and equipment required for hauling material. Old Method - Locating an area outside of immediate project area.

The subcontractor personnel entered the structure and conducted a column-by-column inspection of the transfer of loads through the framework of the building and documented the inspection on videotape. The subcontractor used this information to develop the approved placement plan for a second round of charges. The second round of charges were placed on the fourth, fifth, and sixth floors to further break apart the weakened structure. On the evening of September 17, 1994, one week after the first attempt, the second and final controlled detonation occurred (Figure 2-7). This second controlled detonation quickly and successfully brought the remaining Plant 7 structure to the ground in the predicted location and on the Nicolon 1000™-covered area. A photo of Plant 7 following the second controlled detonation is shown in Figure 2-8.

Once on the ground, the remaining Plant 7 structure was sheared, size-reduced, packaged and dispositioned. Size-reduction and packaging activities continued through November 18, 1994. All waste materials were dispositioned as described in Section 2.5. Figure 2-9 shows the site where Plant 7 had been located, following completion of the D&D.

2.4.4.3 Enhancements

The FEMP received approval from Ohio EPA for the work plan modification on July 27, 1994, and from the U.S. EPA on August 4, 1994. The selection of controlled detonation for the dismantlement of Plant 7 resulted in increased safety, improved cost-effectiveness, and completion of Removal Action No. 19 ahead of the projected schedule. Numerous safety, environmental, and schedule enhancements were obtained. Safety enhancements included:

- reduced exposure of site workers to additional torch cuts;
- reduced time that workers were exposed to possible lead-based paint fumes;
- reduced time workers spent at high altitudes;
- decreased number of heavy lifts workers had to make; and,
- decreased number of workers in the area because the controlled detonation was performed on a weekend, rather than over several work weeks.

Environmental enhancements resulting from the use of controlled detonation rather than modular lifting, included:

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Table 2-6 Material Volumes Generated During Removal Action No. 19

Unbulked Volume (in cubic yards)

Material Type	FY-94	FY-95	Total
Construction Debris	107.9	395.6	503.5
Transite	28.4	64.2	92.6
Residues, Hold-up Material, and Sludges	6.1	0.3	6.4
Masonry, Concrete, Asphalt	23.7	20.7	44.4
Specialty Metals	0	1	1
Restricted Use Metals	0	217.6	217.6
Unrestricted Use Metals	0	104.3	104.3
Friable Asbestos	28.5	3.8	32.3
Total Material Generated	194.6	807.5	1002.1

2.5.1 Size-Reduction and Decontamination

To minimize handling, the building structure, equipment, and piping were removed in large pieces. However, because of container size limitations, material handling equipment capacity, and floor loading restrictions, some items had to be size-reduced in place or at grade level. Size-reduced materials were packaged into appropriate containers for interim storage on the gravel storage pad north of the boiler plant. Structural steel removed during Removal Action No. 19 was staged for recycling. Size-reduction and decontamination methods were consistent with those described in the RAWP. A small portion of scrap metal (light gauge metal), concrete, and transite waste from Removal Action No. 19 was segregated for use in the evaluation of decontamination methods as part of the OU3 Engineering Studies, as described in Section 2.5.5.

2.5.2 Decontamination and Recycling of Structural Steel

ALARON Corporation is performing a decontamination and recycling study on the low-level radiologically-contaminated structural steel from the Plant 7 demolition. The scope of the project includes decontamination of the steel using a combination of mechanical and chemical processes, unrestricted release of the decontaminated steel components, resale of the released components for reuse in commercial markets, and return of the generated secondary and tertiary wastes to the FEMP. Shipments of Plant 7 steel to ALARON began the week of March 27, 1995, and were completed the week of May 1, 1995, five weeks ahead of schedule.

2.5.3 Decontamination and Recycling of Lead

Scientific Ecology Group (SEG), Inc., is performing a decontamination and recycling study on approximately 7 tons of low-level radiologically contaminated lead from the Plant 7 demolition. The scope of the project includes decontamination of the lead using chemical processes, unrestricted release of the decontaminated steel components, and resale of the released components for reuse in commercial markets. Since the generated wastes will be co-mingled with other customer wastes, all wastes generated during this study will be disposed of as SEG wastes. All of the Plant 7 lead is scheduled to be shipped to SEG on July 19, 1995.

2.5.4 Disposal

The materials designated for off-site disposal were packaged and shipped in accordance with Removal Action No. 9. Approximately 613 tons of process area scrap (concrete, construction debris, and light gauge metal) were packaged and shipped to the Nevada Test Site (NTS). The nonfriable transite (140 tons) was also packaged and shipped to the NTS. All dry compactable waste produced during Removal Action No. 19 was sent to the site's waste bailer and mixed with other compactable wastes produced throughout the site. The friable asbestos (21 tons) is currently being stored on the gravel pad north of Plant 8 and on the northwest pad of the Main Tank Farm, and will remain in on-site storage until a permitted disposal facility can be identified. Two white metal boxes (WMBs) containing pigeon droppings (not subject to requirements of RCRA, but presenting a health hazard) are stored on the Plant 1 Pad. During the Plant 7 utilities

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capping activities (Phase I), 5 cubic yards of radiologically-contaminated soil were excavated and dispositioned in accordance with Removal Action No. 17 guidelines.

2.5.5 OU3 Engineering Studies

2.5.5.1 Transite Characterization

The FEMP is responsible for the decontamination of various buildings as part of the environmental remediation activities. The majority of these buildings were built using transite, an asbestos-cement material, that was used for wall and roof panels. Lead was used for door and window facings, and lead washers were used to hold the transite panels together. During the production activities, large quantities of the transite were radioactively-contaminated with uranium and uranium daughter products.

The University of Cincinnati Accelerated Life Testing and Environmental Research (ALTER) Facility is developing a methodology to determine the depth of radioactive contamination and lead in the transite. The purpose of this study is to determine if transite panels are surface or volumetrically contaminated with radioactive material and/or lead.

The distribution of contamination in the transite panels is being determined through a variety of techniques. The most definitive method is the actual delamination of the samples. As each layer of the transite is physically removed, the remaining thickness of and contamination on the transite is measured. The transite samples are being analyzed using Ultraviolet (UV) phosphorescence of uranyl oxides, radiography, and direct survey with a beta-gamma survey meter. Lead contamination is being determined using Modified Toxicity Characteristic Leaching Procedure (MTCLP).

Initial results indicate the radioactive contamination in the Plant 7 transite samples was contained in the top quarter of the samples. However, additional samples must be analyzed to further quantify the depth of contamination and to provide a statistical basis for saying the transite is surface contaminated. Plant 7 results are not expected to be indicative of results obtained from other, more highly contaminated transite, or from "wet process areas" (areas where liquids were used during uranium processing).

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Initial transite MTCLP results indicate the presence of lead. Lead levels are below RCRA regulatory limits. Based on results of this study, further testing may be performed to determine if a correlation exists between the type of process which occurred in a plant and the type of transite contamination expected (wet process/volumetric contamination, dry process/surface contamination).

2.5.5.2 Evaluation of Plant 7 Decontamination Methods

The purpose of this study was to evaluate the effectiveness of the decontamination methods performed on Plant 7 prior to demolition. The decontamination methods used included:

- HEPA filter vacuuming;
- High pressure/low volume washing; and,
- Application of a lockdown material.

Radiological surveys of removable contamination levels were conducted throughout Plant 7 prior to and throughout the decontamination process. These surveys were compiled into a baseline database and databases following each of the three decontamination methods. Data was then statistically analyzed to evaluate the effectiveness of the decontamination methods. Comparison of the baseline to post-lockdown results indicates a statistically significant reduction in removable contamination was achieved at the 99 percent confidence level. Gaps in data collection prevented evaluation of the effectiveness of individual decontamination methods.

2.5.5.3 Application of Test Coatings

During the Plant 7 demolition, four products were tested as dust suppressants. The coatings selected were chosen based on their adhesive and strength characteristics. Three of the products tested were liquid coatings that can be applied using a brush, rollers, or sprayer equipment. These coating included: Primer Sealer Neutralizer/Encasement Material™, Stripcoat™, and Polymeric Barrier System™ (PBS). The first two coatings were each applied to 10' x 20' areas of concrete flooring. The PBS™ was applied to a 20' x 40' area of concrete flooring. While all products performed well at minimizing dust generation during concrete cutting operations, they were not as effective at dust suppression when the concrete was broken up. Of these

three products, the PBS™ was the most effective dust suppressant based on visual observation.

The fourth product tested was Nicolon 1000™ material. This product comes in rolls and is wrapped around the dust generating material. This material was superior to the other three products tested in preventing dust when concrete was broken up. The Nicolon™ was also used as a ground cover surrounding the area where the Plant 7 structure was felled. Based on visual observation, the material prevented the generation of dust clouds when Plant 7 was felled.

2.6 ENVIRONMENTAL MEDIA SAMPLING

Environmental media sampling was conducted during Removal Action No. 19 to ensure protection of human health and the environment. The RAWP stated that environmental monitoring during Removal Action No. 19 would consist of air monitoring and soil surveys. Air monitoring is discussed in Section 2.6.1, and soil surveys are discussed in Section 2.6.2.

2.6.1 Air Monitoring

Air monitoring activities performed during Removal Action No. 19 consisted of monitoring for asbestos, lead, uranium, and nuisance dust.

It was not anticipated that building detonation would result in elevated airborne concentrations of asbestos, lead, or uranium, because removable contamination had been removed during Phases I and II. However, six air monitors were set up and operated around the perimeter of the work site, with samples collected for asbestos, lead, and uranium analyses, in addition to nuisance dust.

Analysis of samples collected during and following the detonation showed asbestos concentrations that averaged 20-30 percent of OEPA limits. The peak measured lead concentration was 0.12 mg/m^3 (0.5 percent of the permissible exposure limit (PEL)), while uranium concentrations at all stations were 0.03 pCi/m^3, which were well below the 0.1 pCi/m^3 DOE standard. Nuisance dust results showed dust concentrations considerably lower than the 15 mg/m^3 OSHA PEL limit. The results of air monitoring conducted for Removal Action No. 19 are located in the CRU3 project files.

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2.6.2 Verification Soil Surveys

Although the RAWP stated that the environmental monitoring to be conducted during Removal Action No. 19 would include radiological soil surveys, the change to controlled detonation for demolition of Plant 7, the use of lockdown encapsulant, and the Nicolon 1000™ ground covering obviated the need for soil surveys, which were therefore not conducted. After Plant 7 had been demolished and the debris had been removed from the concrete and gravel Plant 7 lay down area, low spots were resurfaced and fixative coatings were applied in areas with potentially removable contamination. A walk-over radiological survey was then conducted to verify the levels of removable contamination were below the 10 CFR 835, Appendix D, Surface Radioactivity Values of 1,000 disintegrations per minute (dpm) beta/gamma/100cm^2. As a result of the survey, approximately 90,000 ft^2 of the area surrounding the former Plant 7 structure was downgraded from Contamination Area to Controlled Area status.

The soil beneath Plant 7 is scheduled for removal between a minimum depth of 6 inches and a maximum depth of 2.5 feet, as described in the CRU5 Feasibility Study (FS). The soil beneath Plant 7 will therefore be remediated during the course of CRU5 Record of Decision (ROD) activities.

3.0 CONCLUSIONS

The objective of Removal Action No. 19 was to eliminate the potential for release of contaminants from Plant 7 and to dismantle it to grade level. As detailed in this final report, this objective was accomplished through the removal of pigeon debris, followed by the removal of inventory and loose material from within Plant 7 (Phase I); removal of friable asbestos, gross decontamination of Plant 7 using a high-pressure/low-volume water wash, and application of a lockdown encapsulant (latex paint) in areas of potential loose contamination (Phase II); and the removal of interior ductwork, piping, conduit, equipment, interior transite (ACM), and batting insulation, and the dismantlement of the exterior transite and structural steel down to grade level (Phase III).

Consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Removal Action No. 19 contributed to the efficient performance of projected final remedial actions at the FEMP. The goals of the FEMP in conducting Removal Action No. 19 were to minimize the potential for releases of contaminants, and to conduct the action in a cost efficient and safe manner consistent with site Standard Operating Procedures (SOPs) and worker health and safety requirements. These goals were achieved during this first major structure dismantlement at the FEMP.

Lessons learned from the Plant 7 D & D were discussed throughout the text and are summarized in the Executive Summary (ES-6). These lessons learned are being applied to the other FEMP D & D activities, including Plant 1 and Plant 4.

ATTACHMENT A
SUMMARY OF PLANT 7 WASTEWATER ANALYTICAL RESULTS

During gross decontamination of Plant 7, 3,300 gallons of wastewater were accumulated. In accordance with the Removal Action Work Plan, the wastewater was sampled and analyzed for heavy metals and total uranium. The table below provides a summary of the highest concentrations found in the wastewater. The wastewater was then treated at the Plant 8 Wastewater Treatment System (WWTS) to remove the metals listed below in accordance with 40 CFR 265.1(c)(10). All 3,300 gallons of wastewater were then discharged in accordance with the FEMP NPDES permit. The wastewater sample results are maintained in the FEMP project files.

Summary: Plant 7 Wastewater Analytical Results

Total Uranium	937 mg/L
Cadmium	1.7 mg/L
Chromium	0.59 mg/L
Copper	4.39 mg/L
Nickel	6.90 mg/L
Lead	10.2 mg/L
Zinc	62.6 mg/L
Mercury	1.6 ug/L
Sampled For But Not Detected	
Selenium	
Silver	
Antimony	
Arsenic	