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COMMENT RESPONSES ON THE ENGINEERING EVALUATION/COST ANALYSIS FOR REMOVAL ACTION NO. 27

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LETTER

Department of Energy
Fernald Environmental Management Project
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6357

MAR 2 2 1993

DOE-1323-93

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Graham E. Mitchell, Project Manager
Ohio Environmental Protection Agency
40 South Main Street
Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Mitchell:

COMMENT RESPONSES ON THE ENGINEERING EVALUATION/COST ANALYSIS FOR REMOVAL ACTION NO. 27

Enclosed, for your review and approval, are our responses to your comments on the Engineering Evaluation/Cost Analysis (EE/CA) for Removal Action Number 27, Management of Contaminated Structures at the Fernald Environmental Management Project. The EE/CA is currently being revised and will be submitted to the United States Environmental Protection Agency and Ohio Environmental Protection Agency upon your approval of these comment responses.

Also, responses to the public comments on the EE/CA have been addressed and are enclosed. Additionally, the transcript of the EE/CA Workshop that was held in January has been reviewed and all concerns or issues raised during that meeting have been included with the responses to the public comments.

If you or your staff have any questions, please contact Art Murphy at 513-738-9498.

Sincerely,

Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Murphy

Enclosure: As Stated

Recycled and Recyclable

cc w/ enc.:

J. J. Fiore, EM-42, TREV
K. A. Hayes, EM-424, TREV
B. Barwick, USEPA-V, 5CS-TUB-3
G. Jablonowski, USEPA-V, AT-18J
J. Kwasniewski, OEPA-Columbus
P. Harris, OEPA-Dayton
M. Proffitt, OEPA-Dayton
T. Schneider, OEPA-Dayton
J. Michaels, PRC
L. August, GeoTrans
AR Coordinator, FERMCO

cc w/o enc.:

R. L. Glenn, Parsons
P. Clay, FERMCO/19
D. Dubois, FERMCO/65-2
J. W. Thiesing, FERMCO

RESPONSIVENESS SUMMARY

FOR REMOVAL ACTION NO. 27

MANAGEMENT OF CONTAMINATED STRUCTURES

U.S. Department of Energy
Fernald Field Office

March 1993

EE/CA Removal Action No. 27, Management of Contaminated Structures

Responsiveness Summary

1.0 Overview

On December 16, 1992, the U.S. Department of Energy (DOE) issued a draft report outlining its near-term plans for determining the best alternative for managing contaminated structures. These structures, which are predominantly within the former production area of the Fernald Environmental Management Project, are sources of emissions of radioactive material. This and other environmental issues were identified during DOE's major environmental study, known as the Remedial Investigation and Feasibility Study (RI/FS).

This draft decision-making document is the *Engineering Evaluation and Cost Analysis (EE/CA), Removal Action No. 27, Management of Contaminated Structures.* It identifies DOE's near-term approach for controlling airborne emissions from the former production area and includes DOE's rationale for selecting this approach.

This responsiveness summary is prepared pursuant to the terms of the 1991 Amended Consent Agreement between DOE and the U.S. Environmental Protection Agency, as well as relevant federal laws, regulations and guidelines including:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 United States Code, Section 9601, *et. seq.*, as amended
- National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations, Sections 300.67 and 300.415
- Community Relations in Superfund: A Handbook, January 1992, EPA/540/R-92/009

The EE/CA documents DOE's analysis of seven alternative approaches to managing the contaminated structures within the former production area. They are:

- No Action
- Drain Systems
- Enhance Containment
- Decontaminate Surfaces
- Remove Equipment and Materials
- Remove Equipment and Materials and Clean Surfaces
- Decontaminate and Decommission

DOE's recommended alternative is Alternative 7, which calls for decontaminating and decommissioning (D&D) 25 contaminated components located in Operable Unit 3 and most are within the former production area. In Section 3.0, summary of comments and responses, the 25 components are also referred to as buildings, structures, or facilities.

This alternative was discussed in detail during the EE/CA workshop on January 12, 1993. The workshop included an opportunity for participants to make formal verbal comments. The public comment period began December 23, 1992 and concluded February 8, 1993. In addition to comments made at the workshop, DOE received comments from EPA and the Ohio Environmental Protection Agency.

Judging from the comments made during a workshop on this removal action, residents cautiously support the preferred alternative. However, some residents expressed concerns about real-time monitoring of airborne emissions, funding, final disposition of waste and the estimates for radiation exposure to workers and nearby residents.

This document summarizes, by topic, all significant comments received during the public comment period and documents DOE's response. The responsiveness summary consists of these sections:

1.0 Overview

2.0 Background on Community Involvement

3.0 Summary of Comments Received During the Public Comment Period and Agency Responses

- Part I: Summary and Response to Local Community Concerns
- Part II: Comprehensive Response to Specific Legal and Technical Questions

4.0 Remaining Concerns

Attachment A: Community Relations Activities at the Fernald Site

Attachment B: Numerical Listing of All Comments from the Public Comment Period

Attachment C: Tracking List

2.0 Background on Community Involvement

Environmental issues at Fernald first became public in 1984 when it was reported that nearly 300 pounds of slightly enriched uranium oxide had been released to the atmosphere from the

Plant 9 dust-collector system. It was also disclosed during this time that three off-property wells south of Fernald had been found to be contaminated with uranium in 1981. In 1984, a group of citizens formed a watchdog group called FRESH, Fernald Residents for Environment, Safety and Health.

In 1990, DOE authorized opening an information repository called the Public Environmental Information Center in the JAMTEK Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio 45030. The Administrative Record, on which cleanup decisions are based, also is located at the JAMTEK Building; another administrative record is at U.S. EPA Region 5 Headquarters in Chicago.

In 1986, a remedial investigation and feasibility study was started to assess the nature and extent of contamination at the site and to recommend cleanup strategies. In 1989, as public scrutiny continued, Fernald was designated a Superfund site and placed on the National Priorities List.

When additional monitoring wells showed elevated levels of uranium in 1989 and 1990, DOE agreed to provide bottled water to homes with uranium levels above 2.7 parts per billion (ppb). As work on the RI/FS continued, DOE completed several near-term activities aimed at reducing the potential for a release of contamination that would endanger public health and the environment. In 1991, DOE and EPA also negotiated an Amended Consent Agreement that established a schedule for cleanup activities. Fernald also was closed as a production facility and its operations were transferred to DOE's environmental management and restoration division. In keeping with its cleanup mission, DOE sought an Environmental Restoration Management Contractor (ERMC) that would oversee, direct and manage the cleanup program. The contractor, FERMCO, assumed responsibility December 1, 1992.

3.0 Summary of Comments Received During the Public Comment Period and Agency Responses

A public workshop on the EE/CA was held on January 12, 1993. A court reporter attended this workshop to record public comments, which are incorporated in this responsiveness summary. No other comments were received during the public comment period.

Part I of this section addresses those community concerns and comments that are non-technical in nature. Responses to specific legal and technical questions are provided in Part II. Comments in each part are categorized by topic. The comments have been divided into 13 categories:

1. Scheduling Issues
2. Cost/Funding Issues
3. Environmental Monitoring Issues
4. Notifications
5. Risk Assessment and Exposure Estimates

6. Public Participation
7. Cleanup Standards
8. Subcontracting Issues
9. Terminology
10. Storage/Transportation Issues
11. Data Issues
12. Regulatory Issues
13. Removal Action Issues

3.1 Summary and Response to Local Community Concerns

3.1.1 Scheduling Issues

1. Are you envisioning this being one of the 25 at a time and progressing through, or several at a time, or working a little bit on all of them at one time?

Response: The EE/CA document looks at 25 buildings. What we're doing is basically setting up a framework that is going to allow us to go building by building. We have already committed to Plant No. 7, and there is an individual work plan which is going to be submitted on April 20. What we would like to do annually is identify new buildings. Under the terms of the Amended Consent Agreement, every January 15 we have a submittal which identifies new removal actions. As more funding becomes available, we will have the opportunity to add more removal actions. The EE/CA will identify the preferred alternative and the building. Some of the 25 buildings were picked from a geographic perspective, and some from a risk perspective.

2. Going back to those 25, what would be the criteria, which ones would you pick first out of that?

Response: The first ones we're going to propose are the fire training area on the north area of the site. The second one is the sewage treatment plant incinerator, northeast of the site, near the property line. And the third one is the high and low nitrate tanks right outside the production area.

The reasons we chose those facilities are because they're outside the production area and basically, except for the nitrate tanks, in a controlled area. We can get in and address these structures very quickly, and we thought we could fit them into the funding we have right now.

3.1.2 Cost/Funding Issues

1. I have not read all this stuff but I can't find a total figure for the cost in this document.

   Response: Volume 2, Appendix C breaks the costs down.

2. What's the percent of inflation figure?

   Response: To the midpoint, it was about 12 and a half percent total.

3. Some of this money has been budgeted for this already, correct?

   Response: Yes, that's correct.

4. There are big requests for money for DOE sites across the country and we are not likely to get all the money we're going to need.

   Response: That is a significant concern for DOE.

5. The concern is that DOE starts this program and then runs out of money in the future.

   Response: That's a valid concern.

6. But we're going to be really battling for cleanup dollars.

   Response: It's a national problem.

7. The dismantlement part of DOE's plans is going to be the biggest chunk of money

   Response: That's correct.

3.1.3 Environmental Monitoring Issues

1. What kind of monitoring will you be doing as you do the work; will you have your real-time monitors out there downwind so that you will pick up something you weren't expecting?

Response: The situation will be analogous to what DOE is planning to do on the Plant 1 Ore Silos. Controlled zones will be set up around the ore silos so contamination doesn't leave it. People will wear protective clothing and they will be monitored in and out of the access points. There will also be air monitoring stations set up outside the control areas. If those air monitoring stations show anything significant, operations will be stopped and corrective measures will be established.

2. Would that be real-time monitoring or would it be after the fact type monitors?

Response: It probably will be a collective filter paper analysis, so it's not real-time. We're looking at a lot of methods that are under development for real-time monitoring because, quite frankly, to do the massive D&D program such as we are planning, you're going to have to have some real-time monitoring. You can't take down one beam, take a swipe, send it off to the lab, wait for the results to come back, and then say, "Now we can go to the next one."

3. But for health and safety purpose, what about inhalation?

Response: The stacks will have both the filter paper and the real-time monitors. In addition to that we'll have the continuous air monitors around the removal action site, which will be evaluated on a periodic basis -- either daily or every couple of days.

3.1.4 Notifications

1. Is it written in this document anywhere that as you begin to dismantle these buildings, residents will be notified? Will there be any notification?

Response: DOE's plan is to let residents know what is going on through the usual public affairs channels of meetings and publications. There's a long lead time on each of these in terms of developing the plan. None of these structures are so simple that tomorrow there will be people out in the field ripping these things down.

2. I just want it on the record the fact that people that live in the community do have the right to know what's happening and that people should be notified.

Response: DOE wants to involve the community and keep residents informed.

3.1.5 Risk Assessment and Exposure Estimates

1. In Section 6 of the EE/CA, you're evaluating air quality impact and you're making an air quality impact assessment. You're using the industrial source complex model, which presumes that you have well-developed plumes. Can you expect that during D&D you're going to have well-developed plumes? And there's this double hump in each of the concentrations.

   Response: These are model doses using that model.

2. The industrial source complex model presumes that you have well-developed plumes. This document says that you have two isolated sources. And I don't understand how you tried to estimate conservatively when there wasn't any airborne data. If you look on Table 6-6, you have to make adjustments where you didn't have airborne data based on average alpha contamination level. You multiplied that number by 10, and then you used the model with the two meter plume evaluation.

   Response: Two meters were used to simulate height of a man.

3. But you don't have a plume when you're doing D&D.

   Response: That estimate was for the accident scenario and for the maximum exposure. The accident scenario assumes exposure before the filtration system units were on the building and what the release would be from the resulting plume.

4. But it doesn't sound like this is an accident scenario.

   Response: That's an accident scenario. The section that we're looking at right now is for the chronic low level.

5. It looks like there are two discrete sources.

   Response: There is a discrete source for each facility, and they were assumed to occur concurrently, as if we did all of these actions all at the same time.

6. How do you get that hump on Figure 6-2?

Response: If you go to page 121, the next to the last paragraph, it states that additional conservatism was incorporated into the assessment by assuming that all buildings would undergo D&D simultaneously.

7. You took the removal contamination numbers from each of the facilities that you had, then you modeled those. Then you summed them all up.

Response: Right. So these are all concurrent -- simultaneous, if you will -- releases, and these are the aggregate of the sum of the results.

8. Where was your receptor at?

Response: These results drove the locating of the receptor. These are spatial distributions of the dose, and by looking at that, we can select the overall worst case receptor location. There also is discussion about our worker dose and members of the public.

9. I still don't understand the humps.

Response: In this map there are actually 25 release points, and this is the resulting dose from all 25 release points, and the only ones that really contribute to the dose are two or three in the middle of the area.

10. But 6.3 comes out as 6.2 because 6.3 is just a dose and 6.2 is concentration.

Response: That's right, and you see they overlay, they correlate with each other.

11. When you had each source term for each of the 25, do you run those through the model separately?

Response: The dose is where the concentration is. If we were to take these figures and lay them over a map, you'd see that the main contributor is the two main facilities in the middle of the former production area.

12. Well, if you have old buildings and you've got a massive amount of dust collection on all the beams and everything, are they to be vacuumed first?

Response: Yes. Before we take down any facilities, we will clean as much as possible the residual contamination. So when they actually take down the

facility, this all won't be released. Actually on the Plant 1 Ore Silos (being addressed under separate removal action), because they are outside structures, containment will be established with negative air pressure all around each silo as it's taken down. A similar approach will be used in Plant 7, depending on the building and the level of contamination.

If we take a look at Table 6-6, it's on page 120, it shows the emission rate input to the calculations, and if you go all the way to the right-hand side, the third line down, there's a 6 E to the minus 3. The fifth line down there's a one and a half, 1.45 E to the minus 3. Then all the way down toward the bottom, third line up, there's a 4 times E to the minus 3. Those are the main emission rates and the main contributors; those are the three humps that you see on the chart. So it's telling us that the other sources just don't count; they just don't contribute.

13. They don't contribute at all?

Response: You can calculate a number, but they don't contribute relative to these three that we specifically identified. These three are extremely low.

14. Looking at that same table, you're talking about Plant 7, the main building, the alpha contamination level is a factor of 6 lower than that of Plant 4-A. The thing that makes the difference apparently is the number high efficiency particulate air filters.

Response: That's right.

15. You've also switched units because you've gone from microcuries per second to picocuries per second.

Response: We've got a very large flow rate out of those two facilities as well.

16. It makes it hard to make a comparison when you switch from microcuries to picocuries. So the comparison to those numbers that are 10 to the minus 3 is not that straightforward because you don't have any average alpha contamination levels for the old D&D building.

Response: Yes. The document explains how those gaps were accounted for.

17. I understand it's a question of conservatism because you're trying to point out that neither workers nor residents are going to be impacted.

Response: That is what the document does.

18. If you believe that this is a conservative estimate, I don't have a lot of confidence in the industrial source complex.

Response: In an even simpler calculation, we could look at the existing concentrate from the RAD surveys and we could assume the worst isotope from an external dose conversion factor. Then we could calculate a dose if somebody were to walk over it or if that material was simply going to be picked up in the air.

19. As a fugitive emission? Inhaled?

Response: As a fugitive emission, with no modeling at all. Even then those doses would be fairly small, maybe even smaller than these. Because the calculations done for the environmental assessment for safe shutdown also were very small. We're dealing with radionuclides that have, generally speaking, low concentrations. The radionuclides themselves only deliver a relatively high dose if they are ingested or inhaled. But these radionuclides don't really have an ingestion pathway unless somebody goes into the former production area and eats. Otherwise, it just doesn't amount to a lot.

20. What I don't understand here, you have cubic feet per minute volume and you have a terrible variable in your cubic feet per minute volume to get your rate. How can you vary your rate so much and you don't see a lot of variation over here in this other table? What's the idea of cubic feet per minute volume?

Response: It's driven by the flow rate necessary to keep a negative pressure on that building to keep an inflow. The bigger the building, the more air you have to be pulling through.

21. The thing that is controlling the uncontrolled emission rate is the alpha contamination, and if you don't have the data, then you don't know what the uncontrolled emission rate is.

Response: We were constrained by data we already had. The data we had was not developed, and was not taken and developed in the EE/CA. It was taken to monitor for health and safety reasons.

There are a number of facilities that do not have radiological data. Although we don't have radiological data on all these components, as we

develop the removal actions, if we get funding or something shows up on the building or we find something we didn't expect and we want to go after it as a removal action, at that point we start to develop the removal action work plan. We will call out extra characterization data in the process of performing a D&D action. None of these buildings, in other words, will be decontaminated and dismantled without taking additional data, both radiological surveys as well as various other types of samples to characterize both the occupational conditions for the workers that will be in the facilities as well as data to characterize the waste for disposition.

3.1.6 Public Participation

1. You said that the public has the comment period until February 14 or whatever. And this plan was submitted to U.S. and Ohio EPA. When do you expect to hear back from them?

   Response: We expect to hear back from EPA and Ohio EPA within 30 days of sending it in, which would be January 19.

3.1.7 Cleanup Standards

1. For the pilot plant thorium tank farm, is there another action that has to be taken to get rid of the thorium nitrate solution?

   Response: Yes, there is. That's a separate removal action, and it's going to be done under the safe shutdown removal action development and procedures to process the thorium nitrate.

2. In your magnesium storage building, is that essentially magnesium fluoride or is that new material?

   Response: Magnesium metal. We used this in the reduction process.

3. So it was new material?

   Response: Right, bags of new material coming right in off the treatment.

4. Was it a clean area?

Response: No, it's in the controlled area. It was only used for the storage of magnesium metal. There is minimal suspicion that there would be significant concentrations of surface contamination present. We can't say there's none, but certainly not the levels that we would suspect in the process building or one of the actual plants that was doing the production process. It was a support building.

5. When you talk about taking a building down, are you talking about the total building or just the ground level?

Response: During removal actions, we normally take everything down to the surface level so we don't disturb the soils until we have determined what the possible requirement is for remedial actions.

It's going to depend on the individual building and circumstance. We are going to look at the data and see what makes sense. If it makes sense to go down below grade level, we may do that. I think the way the work plan is worded right now, we're really considering just bringing it down to grade and sealing it off and trying to mitigate any water migration that force contaminants readily down to the aquifer until we have a final cleanup level for soils, which we don't have yet.

6. You have to consider asbestos siding. You have an extreme problem there.

Response: Yes.

7. But all waste will be protected?

Response: Right. There is a removal action that basically establishes the minimum requirements for storage of the different types of wastes at Fernald. So if we go out and we generate soil as a result of a project, if we generate asbestos-containing material, a mixed waste, a hazardous waste, rubble or concrete, that removal action plan -- which has been approved by EPA -- establishes the minimum requirements that we must meet to be able to store that on our site. The days of piles of things sitting around are pretty much over.

8. What criteria will you use to decide which structures to do first?

Response: There were a lot of factors used to select the initial 25 structures. We had a number of criteria to work within. We had the regulatory constraint of

the EE/CA itself and the channels that we had to go through in order to get CERCLA and National Environmental Policy Act (NEPA) approval. Another factor is the facilities' contents and current use. Another factor is time.

The current timetable for Operable Unit 3, which looks at all the contaminants, facilities, buildings, and structures in the former production area, is a draft Record of Decision (ROD) by May 2, 1997. We wanted to go after as many of the facilities as possible prior to that ROD date. Once there is a Record of Decision for Operable Unit 3, we'll develop a full scale remedial action work plan.

What we want to do is cut into those as quickly as we can because EPA and the public recognize that the facilities have to come down. They're beyond their design life; they're contaminated and they serve no useful purpose.

9. What concerns me is, when you say clean, what do you mean by that term? Is that identified or are you still up in the air about what you mean?

Response: Currently what we're using -- for the purposes of this EE/CA -- the Nuclear Regulatory Commission guideline for release limits. This guidance specifies so many disintegrations per minute based on the type of radiation.

However, this guideline usually is applied to nonporous surfaces. For soil and concrete, cleanup standards will have to come out of the CERCLA process. Where no standards or regulatory guidance exist, there must be some consensus on the cleanup standards to be used.

10. In other words, if they set a clean standard lower than what you considered when you were cleaning up, you would be all tripped up?

Response: That's right.

11. So then you have to go lower than what you think they're going to set it at, and how are you going to do that?

Response: If we had a clean standard -- for instance, the Nuclear Regulatory Commission's guideline for nonporous materials -- if that's currently all we have to work with, then that's what we used in this EE/CA.

Everything considered radioactive goes to a low-level waste landfill. So we're erring on the conservative side in these removal actions to answer that question or alleviate that problem with respect to the porous materials.

12. In soil, how many disintegrations per minute are you separating in the process stream? Was there a base limit there, like 25,000 disintegrations per minute?

Response: Yes. Highly contaminated soils are packed in boxes and stored until they can be treated and/or disposed. If the soil contaminant levels are above so many picocuries per gram, we would put it in a controlled stockpile.

What we're trying to minimize, except for those areas that are more highly contaminated, we try to minimize soil excavation until we get to a cleanup number. We only try and go after the hot spots to minimize migration. We are trying to develop a soil treatment system so that we don't have to be shipping all this soil off.

13. In your incinerator area, are you primarily talking about high levels of soil contamination there or are you talking about high levels of contamination on equipment?

Response: It's primarily soil contamination. The facility itself is very small. It's contaminated, but it's a sheet metal structure. The facility that is addressed in the EE/CA is the incinerator.

14. The soil washing technique is not here yet?

Response: We're developing some technologies and integrated demonstrations to perform soil washing. We need something that is efficient in removing uranium but can process a lot of soil. We have a lot of soil on-site that we would like to process. From the incinerator alone, we've generated about 200 three-cubic-yard boxes.

3.1.8 Subcontracting Issues

1. Do you foresee using workers already on site or will this work be contracted out?

Response: It will be a combination of both. What we envision doing is contracting out a lot of the specialty work.

2. Why is EBASCO's name on all this cost analysis stuff? Are they a subcontractor?

Response: EBASCO is a subcontractor.

3. Are they still a subcontractor?

Response: Yes. They were the technical support contractor that developed the EE/CA for us.

3.1.9 Terminology

1. You referred to these as buildings, but in fact a couple of them are tanks.

Response: That's correct. That's a misnomer. The actual title is structures.

2. I have a real problem with this recycling stuff, I have a real major problem with this. I want it on the record that I have a problem with it because too many times over the last eight years that we've been doing this work we've seen things leave this site that were decontaminated, and yet two or three years later they're brought back to this site because they're still contaminated, and DOE is paying a tremendous amount of money to have to get them back here. And I have a problem with copper or other materials being pulled out of these structures, being decontaminated and being sold to somebody. Then ten years later we find out that these materials was not decontaminated.

Response: That is a big concern. There's a lot of discussion going on nationwide about that because while recycling is good, you have to be careful when you recycle material. A lot of the recycling we're looking at, for example, would involve taking some of the contaminated concrete and grinding it up and using it in aggregate to make more concrete for a structure that we're going to build on-site. That counts as recycling.

Another very good example is the scrap metal from the very large scrap metal pile. We recently got approval to process this scrap metal to make metal boxes that can later be used to transport wastes to the Nevada Test Site for disposal.

3. I'm a little confused because I've heard there are 25 buildings in this EE/CA document, correct?

Response: Twenty-five structures.

4. I heard you say 110 structures and 240 components, and I'm really confused now because I've heard 25 buildings, 110 structures, 240 components, and I don't know what you're talking about. I think it's important that you pick a word -- building, component or structure. There needs to be a little finer definition.

   Response: Components include all the buildings, all the drum waste, all the below- and above-ground utilities, all the below- and above-ground tanks, all the railroad, the parking lot and all the ponds and basins that are characterized. We don't count each drum individually, that would be a component. If you count all those up, that would be 240. We are dealing with a subset of that total.

3.1.10 Storage/Transportation Issues

1. Is the waste to be shipped to the Nevada Test Site? Would that be considered hazardous material or low-level material?

   Response: It depends; it could be both. When we do our characterization, we'll determine whether the hazardous waste has been radioactively contaminated. If it has not been contaminated, then we can ship it to a number of places.

2. Would you already know if the waste is to be shipped off right away or will it remain stored in the plant until you have been able to classify it?

   Response: It depends on the particular waste stream and removal action.

3. That's what I mean. Will all that be considered before the building is destroyed or taken down?

   Response: Yes. For example, for the Plant 1 Ore Silos Removal Action, we're going to recycle to the maximum extent. For that particular removal action, we will be shipping the waste right away.

4. It will not remain on site?

   Response: We will try to maximize shipping materials right away for most of these projects. If we start decontaminating and decommissioning a lot of these

facilities, we will have to store some of the material for a temporary period of time until we can get rid of it.

5. What is considered temporary time?

Response: Clearly we don't want to store it on-site very long because we have drum waste we want to get rid of and construction waste from other ongoing projects that we want to get rid of. It will be a prioritization of that waste, and the stuff that's got the highest level of radioactivity when it's characterized will be sent off.

6. Will you complete a building and then have everything stored in a controlled manner and then start on another building, or are you going to do two or three buildings at a time?

Response: We anticipate starting multiple jobs at once. The reason we developed this EE/CA was to facilitate that process. The decision on the site is that all the buildings are going to come down. This EE/CA is just addressing 25. We're going to go after those buildings in the most expeditious fashion we can.

7. Is there any waste being stored in any of the 25 structures? What are you going to do with that waste?

Response: There is some waste stored in the structures. We're going to either have to process it, if it's drums of residue, or we're going to have to dry it and process it before we ship it to the Nevada Test Site. Or we're going to have to move it to another structure.

8. Let me play devil's advocate with you just a minute. What are you going to when Nevada Test Site no longer will accept Fernald waste? What are you going to do then?

Response: That's a tough decision. But DOE is looking at other options.

9. What other sites is DOE looking at for disposing of wastes? Is Envirocare open? It's in Utah, right?

Response: Envirocare is one. It's open. It's open and operational.

10. There's big talk in Ohio about the low-level radioactive waste site for the compact site. Is DOE looking at or thinking about the possibility of using the low-level radioactive waste site in Ohio when it's built? Right now it can't be done, but I think the concern of the community is that several years down the road it possibly could be done.

Response: According to Ohio EPA, Fernald low-level radioactive waste can't be taken to the compact site. Fernald has too much waste for the proposed size of the compact site. There could be a possibility that it could be a co-location site.

11. Once you complete decontaminating and dismantling the first three structures, are those targeted areas for waste storage?

Response: No, those areas are not. A future waste storage area could be potentially east of the fire training area.

12. Once you have it in a box, is it shipped? Or would you, if you had a technology, wash the soil?

Response: We'd like to clean the soil. The boxes currently being filled are not being shipped to the Nevada Test Site yet. We're waiting on soil characterization data on the boxes to make sure there are no chemical contaminants. Also, to maximize space, we filled the boxes full, which apparently doesn't meet Nevada Test Site criteria for accepting waste.

So what we would have to do is either empty those boxes and treat the soil or empty the soil into approved storage containers.

3.1.11 Data Issues

1. When I look at the radiological data, many of these facilities don't have any data. Is that because it doesn't exist? For example, is the magnesium storage building likely to be contaminated?

Response: Probably not, not from inside. Possibly outside. But there isn't data on all the buildings. We don't have radiological data on all the buildings.

2. Some of them have data on them.

Response: The data that was compiled in this EE/CA was taken from existing radiological surveys at the site. Those surveys have centered around areas where there are workers or where we feel there may be high levels of contamination. A lot of buildings that show no data are ones that either didn't need to be analyzed for worker exposure or are not suspected of being contaminated. But there was process knowledge data that was used to pick these buildings. The radiological data was not the only source.

3.1.12 Regulatory Issues

1. Does the Amended Consent Agreement penalty take into consideration the money needed to complete a project? Is it important or is it not very important?

Response: It is of the utmost importance.

2. So once you get an Amended Consent Agreement, you have more or less a guarantee that you're going to come through with the project?

Response: The Consent Agreement does not guarantee funding, but it is an important consideration in the budget process. Up to this point we've been very successful in our budgets because we can tie the projects and milestones back to the Amended Consent Agreement or Consent Decree.

3.1.13 Removal Action Issues

1. When you start to do this work, you're going to have to really coordinate with all the other operable unit people and make sure it all kind of falls and flows in together here.

Response: Yes, there will be coordination between waste management and safe shutdown.

2. So are you kind of looking at the attitude of we'll do the easiest ones first and see how it goes?

Response: Yes, except we have tackled some bigger ones, especially if the structure is deemed to be a potential hazard because of contamination, such as the Plant 1 Ore Silos where the material contained thorium.

Part II Comprehensive Response to Specific Legal and Technical Questions

3.2.1 U.S. Environmental Protection Agency Comments

GENERAL COMMENTS

1. The relationship between Removal Action No. 27 and other key removal actions, including No. 9 (Removal of Waste Inventories), No. 12 (Safe Shutdown), No. 17 (Improved Storage of Soil and Debris), and No. 26 (Asbestos Abatement Program) should be explained in work plans submitted for Removal Action No. 27.

   Response: It is the intention of DOE to include in the work plans developed under Removal Action No. 27, a description of the relationships between Removal Action No. 27 and other key removal actions, including No. 9 (Removal of Waste Inventories), No. 12 (Safe Shutdown), No. 17 (Improved Storage of Soil and Debris) and No. 26 (Asbestos Abatement Program).

2. The action-specific applicable or relevant and appropriate requirements (ARARs) should include the Occupational Safety and Health Administration (OSHA) standards for construction (29 CFR Part 1926).

   Response: The action-specific applicable or relevant and appropriate requirements (ARARs) described in Appendix B, Table B-3, will be revised to include the Occupational Safety and Health Administration (OSHA) standards for construction (29 CFR Part 1926).

3. The work plan for Plant No. 7 and the fire training facilities (73A through E) might not contain the analytical results from the OU3 RI; DOE should assure that field sampling and analysis plans are sufficient to support the D&D effort.

   Response: DOE will ensure that the field sampling and analysis plans for Plant No. 7 and the fire training facilities (73A through E) are structured to support the D&D objectives for CRU3 and to be consistent with the final remedy.

SPECIFIC COMMENTS

1. Section 2.4, Page 37, Paragraph 2: The work plan for each group of structures scheduled for D&D should indicate whether contamination levels have been reduced by the ongoing Removal Action No. 12, safe shutdown.

Response: The work plan for each individual or group of structures scheduled for D&D will consider the extent to which the tasks intended for completion under Removal Action No. 12 have been accomplished and their associated reduction of contamination levels. These include:

- modify the facility, as required, to include the construction of temporary containment structures, step off pads, ventilation systems, etc.
- seal all drains, vents, and other openings from the building as necessary to prevent the release of radioactive material during shutdown activities
- isolate utilities (natural gas supply, electrical, stream, water, air, etc. from process equipment)
- remove excess material to approved storage location
- transfer hold-up material and residues to storage containers
- transfer drummed material to approved storage location
- decontaminate area (gross contamination)
- transfer materials and equipment either to proper interim storage facilities on-site, or to appropriate disposition off-site, according to vendor selection and DOE approval.

2. Section 2.5.2, Page 60, Paragraph 1: The work plans for Removal Action No. 27 should identify structures of questionable structural integrity and the safety measures that will be taken to avoid potential risks to workers.

Response: The work plans for Removal Action No. 27 will, as appropriate, identify structures of questionable structural integrity as well as the safety measures that will be taken to avoid potential risks to workers.

3. Section 3.6.1, Page 67, Paragraph 4: Six (6) RCRA hazardous waste management units will be closed under Removal Action No. 27. DOE should indicate that the RCRA actions will be consistent with the final remedy for OU3.

Response: In the individual work plans for structures containing RCRA hazardous waste management units, DOE will insure that the plan is consistent with the RCRA closure objectives as required, and that these are consistent with the final remedy for CRU3.

4. Appendix B, Table B-3: The potential action-specific requirements should include the OSHA standards for D&D (20CFR Parts 1910 and 1926).

Response: Appendix B, Table B-3 will be revised to include the OSHA standards for D&D (20 CFR Parts 1910 and 1926) as explained in the response to general question No. 2 above.

3.2.2 Ohio Environmental Protection Agency Comments

GENERAL COMMENT

1. The EE/CA contains no schedule commitment on the part of DOE. The document should at a minimum include a proposed schedule and a commitment for the date of submittal of the first D&D work plan.

   Response: A schedule for implementation of Removal Action No. 27 has not yet been developed but it is DOE's intention to provide with the D&D work plans for each structure, a detailed schedule. DOE intends to prepare the work plans and schedules as part of the annual removal action procedure outlined in Section IX F.3 of the Amended Consent Agreement. Although a tentative planning schedule has been outlined to implement this removal action, it is currently on hold due to the development of the Proposed Plan/Interim ROD.

SPECIFIC COMMENTS

1. Executive Summary: Because integration between this EE/CA and other removal actions is critical for success, the four removal actions (9, 12, 17,26) should be mentioned in a brief paragraph in the Executive Summary.

   Response: DOE concurs that the Executive Summary should contain a paragraph explaining the relationship between Removal Action No. 27 and the other key removal actions (9,12,17,26) and will ensure that one is added during the revision of the document.

2. Section 1.3, page 6, first line: A reference for this document should be provided in Section 7.0.

   Response: This reference will be added to Section 7.0 of the document: U.S. EPA, 1987. Office of Solid Waste and Emergency Response, *Draft Engineering Evaluation/Cost Analysis Guidance for Non-Time Critical Removal Actions*, Draft, June 1987.

3. Section 2.3, page 43, last paragraph: The significance of the "*" within this paragraph is unclear. If it's a typo, please correct. If not, please clarify.

Response: The "*" appearing in Section 2.3, page 43, last paragraph, is a typographical error and will be removed.

4. Table 2-7, page 53: The table should include both DOE and Nuclear Regulatory Commission (NRC) criteria if they differ.

Response: The criteria from DOE 5400.5 and NRC1.86 are virtually identical with the exception noted in footnote g in Table 2-7, where the criteria quoted for Transuranics and the other radionuclides in that category, are drawn only from NRC since DOE provides no guidance for them. Footnote g will be adjusted to read "Guidelines for these radionuclides are not given in DOE Order 5400.5; however, these guidelines, drawn from NRC1.86, are considered appropriate until further DOE guidance is provided.

5. Section 4.1.5, page 73, 4th paragraph: The paragraph suggests oil and gas will be incinerated and the residue shipped off-site for disposal as low-level waste (LLW). The document fails to discuss this incineration in any more depth. On-site incineration will require complying with applicable or relevant and appropriate requirements (ARARs) and permits in accordance with the Ohio/DOE Consent Order. If DOE is considering on-site incineration, additional detail must be provided within the EE/CA.

Response: It is not DOE's intention at this time to undertake on-site incineration and the last sentence in the paragraph in question on page 73 will be altered to read "Any oil or gasoline in the equipment is drained and shipped off-site for incineration. The LLW residue will be dispose at an approved off-site LLW facility."

6. Section 4.1.7, page 75, 3rd paragraph: Since DOE is unable to dispose of mixed waste at this time, every effort must be made to minimize the generation of such wastes. The use of rags and/or cleaning agents which result in additional mixed waste generation must be a last choice option only.

Response: DOE concurs that the minimization of mixed waste is a priority. The third paragraph on page 75 will be modified to read "Remove equipment from structures, as outlined in Alternative 5, then clean surfaces by first washing/wiping the surfaces with steam or soap and water, and vacuuming to remove any remaining loose contamination. Used rags would be packaged and disposed as LLW. Hazardous materials, if encountered,

would be disposed or cleaned in such a way as to minimize the volume of mixed waste."

7. Section 4.1.7, page 76, 3rd paragraph: It is unclear the justification for the assumption that most transite sheets and insulation can be disposed of at an off-site landfill. It would seem the level of contamination within the production area and the airborne deposition of uranium contamination onto structures would assure most transite is contaminated. Additionally, if it is assumed most of the transite is not contaminated, then why is it assumed all lead bolts are mixed wastes.

Response: The assumptions regarding the disposition of transite and other waste materials as described in Section 4 of the EE/CA, were developed to support the cost analysis portion of the report consistent with approaches to waste disposition contained in other CRU 3 documents. DOE intends the actual disposition of materials from any given structure during D&D, to be determined in accordance with site specific sampling and analysis procedures developing in the forthcoming individual D&D work plans. It will, however, be a continuing objective of DOE to maximize free release when possible without jeopardy to human health or the environment. At this time only non-porous materials can be released without radiological restriction. There is currently no procedure or techniques for certifying the release status of porous materials, based on NRC free release criteria.

8. Table 4-1, page 79, Thermal Treatment: The off-site designation in this table doesn't appear to agree with the text in section 4.1.5 (see comment 5 above). Please clarify the off-site versus the on-site incineration issue.

Response: As mentioned in the response to question 5, it is not the intention of DOE to conduct on-site incineration. The designation in Table 4-1 is correct and the text in section 4.1.5 will be modified to make more clear the intention for off-site incineration.

9. Section 5.4, page 94: This section should include a more in-depth discussion of ARARs and to be considered (TBC) associated with disposition of wastes (e.g. free-release criteria, criteria for disposal of transite at an off-site landfill, etc.)

Response: The general discussion of ARARs and TBCs associated with waste disposition provided in the EE/CA document on pages 102 and 103 will be supplemented with a table listing the ARARs and TBCs most likely to be applicable to Removal Action No. 27, based on experience in other removal actions.

4.0 Remaining Concerns

The public specifically asked to be notified when work starts on the actual structures. In response, DOE noted that residents would have ample notification through the normal Public Affairs program.

ATTACHMENT A

Community Relations Activities at Fernald

Community Relations activities conducted at Fernald have included:

- A community assessment (June - July 1989)
- A Community Relations Plan (most recent version - August 1992; approved October 15, 1992)
- Public reading rooms and administrative record
- Regular briefings at local township trustee meetings
- Presentations to the local activist group, FRESH
- Regular, approximately quarterly, community meetings
- Workshops and roundtables for interested parties
- Press releases as necessary, as well as fact sheets and a newsletter
- Public comment periods for decision documents and responsiveness summaries
- Tours, as requested
- Annual environmental monitoring reports
- A citizens advisory committee

Attachment B

Numerical List of All Comments

Part I

1. Are you envisioning this being one of the 25 at a time and progressing through, or several at a time, or working a little bit on all of them at one time?

2. Do you foresee using workers already on site or will this be contracted out?

3. You referred to these as buildings, but in fact a couple of them are tanks.

4. When I look at the radiological data, many of these facilities don't have any data. Is that because it doesn't exist? For example, is the magnesium storage building likely to be contaminated?

5. Some of them have data on them.

6. For the pilot plant thorium tank farm, is there another action that has to be taken to get rid of the thorium nitrate solution?

7. In your magnesium storage building, is that essentially magnesium fluoride or is that new material?

8. So it was new material?

9. Was it a clean area?

10. When you talk about taking a building down, are you talking about the total building or just the ground level?

11. You have to consider asbestos siding. You have an extreme problem there.

12. Is the waste to be shipped to the Nevada Test Site? Would that be considered hazardous material or low level material?

14. Would know if the waste is to be shipped off right away or will it remain stored in the plant until you have been able to classify it?

15. That's what I mean. Will all that be considered before the building is destroyed or taken down?

16. It will not remain on site?

17. What is considered temporary time?

18. But all waste will be protected?

19. Will you complete a building and then have everything stored in a controlled manner and then start on another building, or are you going to do two or three buildings at a time?

20. What criteria will you use to decide which structures to do first?

21. You said that the public has the comment period until February 14 or whatever. And this plan was submitted to U.S. and Ohio EPA. When do you expect to hear back from them?

22. I have not read all this stuff but I can't find a total figure for the cost in this document.

23. What's the percent of inflation figure?

24. Some of this money has been budgeted for this already, correct?

25. There are big requests for money for DOE sites across the country and we are not likely to get all the money we need.

26. The concern is that DOE starts this program and then runs out of money in the future.

27. I have a real problem with this recycling stuff, I have a real major problem with this. I want it on the record that I have a problem with it because too many times over the last eight years that we've been doing this work we've seen things leave this site that were decontaminated, and yet two or three years later they're brought back to this site because they're still contaminated, and DOE is paying a tremendous amount of money to have to get them back here. And I have a problem with copper or other materials being pulled out of these structures, being decontaminated and being sold to somebody. Then ten years later we find out that this material was not decontaminated.

28. I'm a little confused because I've heard there are 25 buildings in this EE/CA document, correct?

29. Is there any waste being stored in any of the 25 structures? What are you going to do with that waste?

30. Let me play devil's advocate with you for just a minute. What are you going to do when Nevada Test Site shuts Nevada's border? What are you going to do then?

31. What other sites is DOE looking at for disposing of wastes? Is Envirocare open? It's in Utah, right?

32. There's big talk in Ohio about the low-level radioactive waste site for the compact site. Is DOE looking or thinking about the possibility of using the low-level radioactive waste site in Ohio when it's built? Right now it can't be done, but I think the concern of the community is that several years down the road it possibly could be done.

33. I heard you say 110 structures and 240 components, and I'm really confused now because I've heard 25 buildings, 110 structures, 240 components, and I don't know what your talking about. I think it's important that you pick a word -- building, component, structure. There needs to be a little finer definition.

34. Why is EBASCO's name on all this cost analysis stuff? Are they a subcontractor?

35. Are they still a subcontractor?

36. What concerns me is, when you say clean, what do you mean by that term? Is that identified or are you still up in the air about what you mean?

37. In other words, if they set a clean standard lower than what you considered when you were cleaning up, you would be all tripped up?

38. So then you have to go lower than what you think they're going to set it at, and how are you going to do that?

39. In soil, how many disintegrations per minute are you separating in the process stream? Was there a base limit there, like 25,000 disintegrations per minute?

40. Does the Amended Consent Agreement penalty take into consideration the money needed to complete a project? Is it important or is it not very important?

41. So once you get an Amended Consent Agreement, you have more or less a guarantee that you're going to come through with the project?

42. But we're going to be really battling for cleanup dollars.

43. The dismantlement part of it is going to be the biggest chunk of money.

44. Going back to those 25, what would be the criteria, which ones would you pick first out of that?

45. Once you complete decontaminating and dismantling the first three structures, are those targeted areas for waste storage?

46. When you start to do this work, you're going to have to really coordinate with all the other operable unit people and make sure it all kind of falls and flows in together here.

47. So are you kind of looking at the attitude of we'll do the easiest ones first and see how it goes?

48. In your incinerator area there, are you primarily talking about high levels of soil contamination there or are you talking about high levels of equipment?

49. The soil washing technique is not here yet?

50. Once you have it in a box, is it shipped? Or would you, if you had a technology, wash the soil?

51. In section 6 of the EE/CA, you're evaluating air quality impact and you're making an air quality impact assessment. You're using the industrial source complex model, which presumes that you have well-developed plumes. Can you expect that during D&D you're going to have well-developed plumes? And there's this double hump in each of the concentrations.

52. The industrial source complex model presumes that you have well-developed plumes. This document says that you have two isolated sources. And I don't understand how you tried to estimate conservatively when there wasn't any airborne data. If you look on table 6-6, you have to make adjustments where you didn't have airborne data based on the average alpha contamination level. You multiplied that by 10, and then you used the model with the two meter plume evaluation.

53. But you don't have a plume when you're doing D&D.

54. But it doesn't sound like this is an accident scenario.

55. It looks like there are two discrete sources.

56. How do you get that hump (on figure 6-2?)

57. You took the removal contamination numbers from each of the facilities that you had, then you modeled those. Then you summed them all up.

58. Where was your receptor at?

59. I still don't understand the humps.

60. But 6.3 comes out as 6.2 because 6.3 is just a dose and 6.2 is concentration.

61. When you had each source term for each of the 25, do you run those through the model separately?

62. Well, if you have old buildings and you've got a massive amount of dust collection on all the beams and everything, are they to be vacuumed first?

63. They don't contribute at all?

64. Looking at that same table, you're talking about Plant 7, the main building, the alpha contamination level is a factor of 6 lower than Plant 4-A. The thing that makes the difference apparently is the number of high efficiency particulate air filters.

65. You've also switched units because you've gone from microcuries per second to picocuries per second.

66. It makes it hard to make a comparison when you switch from microcuries to picocuries. So the comparison of those numbers that are 10 to the minus 3 is not that straightforward because you don't have any average alpha contamination levels for the old D&D building.

67. I understand it's a question of conservatism because you're trying to point out that neither workers nor residents are going to be impacted.

68. If you believe that this is a conservative estimate, I don't have a lot of confidence in the industrial source complex.

69. As a fugitive emission? Inhaled?

70. What I don't understand here, you have cubic feet per minute volume and you have a terrible variable in your cubic feet per minute volume to get your rate. How can you vary your rate so much and you don't see a lot of variation over here in this other table? What's the idea of cubic feet per minute volume?

71. The thing that is controlling the uncontrolled emission rate is the alpha contamination, and if you don't have the data, then you don't know what the uncontrolled emission rate is.

72. What kind of monitoring will you be doing as you do the work; will you have your real time monitors out there downwind so that you will pick up something you weren't expecting?

73. Would that be real time monitoring or would it be after the fact type monitors?

74. But for health and safety purpose, what about inhalation?

75. Is it written in this document anywhere that as you begin to dismantle these buildings, residents will be notified? Will there be any notification?

76. I just want it on the record the fact that people that live in the community do have the right to know what's happening, and that people should be notified.

Part II

U.S. Environmental Protection Agency

GENERAL COMMENTS

1. The relationship between Removal Action No. 27 and other key removal actions, including No. 9 (Removal of Waste Inventories), No. 12 (Safe Shutdown), No. 17 (Improved Storage of Soil and Debris), and No. 26 (Asbestos Abatement Program) should be explained in work plans submitted for Removal Action No. 27.

2. The action-specific applicable or relevant and appropriate requirements (ARARs) should include the Occupational Safety and Health Administration (OSHA) standards for construction (29 CFR Part 1926).

3. The work plan for Plant No. 7 and the fire training facilities (73A through E) might not contain the analytical results from the OU3 RI; DOE should assure that field sampling and analysis plans are sufficient to support the D&D effort.

SPECIFIC COMMENTS

1. Section 2.4, Page 37, Paragraph 2: The work plan for each group of structures scheduled for D&D should indicate whether contamination levels have been reduced by the ongoing Removal Action No. 12, safe shutdown.

2. Section 2.5.2, Page 60, Paragraph 1: The work plans for Removal Action No. 27 should identify structures of questionable structural integrity and the safety measures that will be taken to avoid potential risks to workers.

3. Section 3.6.1, Page 67, Paragraph 4: Six (6) RCRA hazardous waste management units will be closed under Removal Action No. 27. DOE should indicate that the RCRA actions will be consistent with the final remedy for OU3.

4. Appendix B, Table B-3: The potential action-specific requirements should include the OSHA standards for D&D (20CFR Parts 1910 and 1926).

Ohio Environmental Protection Agency

GENERAL COMMENT

1. The EE/CA contains no schedule commitment on the part of DOE. The document should at a minimum include a proposed schedule and a commitment for the date of submittal of the first D&D work plan.

SPECIFIC COMMENTS

1. Executive Summary: Because integration between this EE/CA and other removal actions is critical for success, the four removal actions (9, 12, 17,26) should be mentioned in a brief paragraph in the Executive Summary.

2. Section 1.3, page 6, first line: A reference for this document should be provided in Section 7.0.

3. Section 2.3, page 43, last paragraph: The significance of the "*" within this paragraph is unclear. If it's a typo, please correct. If not, please clarify.

4. Table 2-7, page 53: The table should include both DOE and Nuclear Regulatory Commission (NRC) criteria if they differ.

5. Section 4.1.5, page 73, 4th paragraph: The paragraph suggests oil and gas will be incinerated and the residue shipped off-site for disposal as low-level waste (LLW). The document fails to discuss this incineration in any more depth. On-site incineration will require complying with applicable or relevant and appropriate requirements (ARARs) and permits in accordance with the Ohio/DOE Consent Order. If DOE is considering on-site incineration, additional detail must be provided within the EE/CA.

6. Section 4.1.7, page 75, 3rd paragraph: Since DOE is unable to dispose of mixed waste at this time, every effort must be made to minimize the generation of such wastes. The use of rags and/or cleaning agents which result in additional mixed waste generation must be a last choice option only.

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8. Table 4-1, page 79, Thermal Treatment: The off-site designation in this table doesn't appear to agree with the text in section 4.1.5 (see comment 5 above). Please clarify the off-site versus the on-site incineration issue.

9. Section 5.4, page 94: This section should include a more in-depth discussion of ARARs and to be considered (TBC) associated with disposition of wastes (e.g. free-release criteria, criteria for disposal of transite at an off-site landfill, etc.)

ATTACHMENT C

Tracking List for Public Comments

1. Are you envisioning this being one of the 25 at a time and progressing through, or several at a time, or working a little bit on all of them at one time?

   Addressed Under: Scheduling Issues

2. Do you foresee using workers already on site or will this be contracted out?

   Addressed Under: Subcontracting Issues

3. You referred to these as buildings, but in fact a couple of them are tanks.

   Addressed Under: Terminology

4. When I look at the radiological data, many of these facilities don't have any data. Is that because it doesn't exist? For example, is the magnesium storage building likely to be contaminated?

   Addressed Under: Data Issues

5. Some of them have data on them.

   Addressed Under: Data Issues

6. For the pilot plant thorium tank farm, is there another action that has to be taken to get rid of the thorium nitrate solution?

   Addressed Under: Cleanup Standards

7. In your magnesium storage building, is that essentially magnesium fluoride or is that new material?

   Addressed Under: Cleanup Standards

8. So it was new material?

Addressed Under: Cleanup Standards

9. Was it a clean area?

Addressed Under: Cleanup Standards

10. When you talk about taking a building down, are you talking about the total building or just the ground level?

Addressed Under: Cleanup Standards

11. You have to consider asbestos siding. You have an extreme problem there.

Addressed Under: Cleanup Standards

12. Is the waste to be shipped to the Nevada Test Site? Would that be considered hazardous material or low level material?

Addressed Under: Storage/Transportation Issues

14. Would know if the waste is to be shipped off right away or will it remain stored in the plant until you have been able to classify it?

Addressed Under: Storage/Transportation Issues

15. That's what I mean. Will all that be considered before the building is destroyed or taken down?

Addressed Under: Storage/Transportation Issues

16. It will not remain on site?

Addressed Under: Storage/Transportation Issues

17. What is considered temporary time?

Addressed Under: Storage/Transportation Issues

18. But all waste will be protected?

Addressed Under: Cleanup Standards

19. Will you complete a building and then have everything stored in a controlled manner and then start on another building, or are you going to do two or three buildings at a time?

Addressed Under: Storage/Transportation Issues

20. What criteria will you use to decide which structures to do first?

Addressed Under: Cleanup Standards

21. You said that the public has the comment period until February 14 or whatever. And this plan was submitted to U.S. and Ohio EPA. When do you expect to hear back from them?

Addressed Under: Public Participation

22. I have not read all this stuff but I can't find a total figure for the cost in this document.

Addressed Under: Cost/Funding Issues

23. What's the percent of inflation figure?

Addressed Under: Cost/Funding Issues

24. Some of this money has been budgeted for this already, correct?

Addressed Under: Cost/Funding Issues

25. There are big requests for money for DOE sites across the country and we are not likely to get all the money we need.

Addressed Under: Cost/Funding Issues

26. The concern is that DOE starts this program and then runs out of money in the future.

Addressed Under: Cost/ Funding Issues

27. I have a real problem with this recycling stuff, I have a real major problem with this. I want it on the record that I have a problem with it because too many times over the last eight years that we've been doing this work we've seen things leave this site that were decontaminated, and yet two or three years later they're brought back to this site because they're still contaminated, and DOE is paying a tremendous amount of money to have to get them back here. And I have a problem with copper or other materials being pulled out of these structures, being decontaminated and being sold to somebody. Then ten years later we find out that this material was not decontaminated.

Addressed Under: Terminology

28. I'm a little confused because I've heard there are 25 buildings in this EE/CA document, correct?

Addressed Under: Terminology

29. Is there any waste being stored in any of the 25 structures? What are you going to do with that waste?

Addressed Under: Storage/Transportation Issues

30. Let me play devil's advocate with you for just a minute. What are you going to do when Nevada Test Site shuts Nevada's border? What are you going to do then?

Addressed Under: Storage/Transportation Issues

31. What other sites is DOE looking at for disposing of wastes? Is Envirocare open? It's in Utah, right?

Addressed Under: Storage/Transportation Issues

32. There's big talk in Ohio about the low-level radioactive waste site for the compact site. Is DOE looking or thinking about the possibility of using the low-level radioactive waste site in Ohio when it's built? Right now it can't be done, but I think the concern of the community is that several years down the road it possibly could be done.

Addressed Under: Storage/Transportation Issues

33. I heard you say 110 structures and 240 components, and I'm really confused now because I've heard 25 buildings, 110 structures, 240 components, and I don't know what your talking about. I think it's important that you pick a word -- building, component, structure. There needs to be a little finer definition.

Addressed Under: Terminology

34. Why is EBASCO's name on all this cost analysis stuff? Are they a subcontractor?

Addressed Under: Subcontracting Issues

35. Are they still a subcontractor?

Addressed Under: Subcontracting Issues

36. What concerns me is, when you say clean, what do you mean by that term? Is that identified or are you still up in the air about what you mean?

Addressed Under: Cleanup Issues

37. In other words, if they set a clean standard lower than what you considered when you were cleaning up, you would be all tripped up?

Addressed Under: Cleanup Standards

38. So then you have to go lower than what you think they're going to set it at, and how are you going to do that?

Addressed Under: Cleanup Standards

39. In soil, how many disintegrations per minute are you separating in the process stream? Was there a base limit there, like 25,000 disintegrations per minute?

Addressed Under: Cleanup Standards

40. Does the Amended Consent Agreement penalty take into consideration the money needed to complete a project? Is it important or is it not very important?

Addressed Under: Regulatory Issues

41. So once you get an Amended Consent Agreement, you have more or less a guarantee that you're going to come through with the project?

Addressed Under: Regulatory Issues

42. But we're going to be really battling for cleanup dollars.

Addressed Under: Cost/Funding Issues

43. The dismantlement part of it is going to be the biggest chunk of money.

Addressed Under: Cost/Funding Issues

44. Going back to those 25, what would be the criteria, which ones would you pick first out of that?

Addressed Under: Scheduling Issues

45. Once you complete decontaminating and dismantling the first three structures, are those targeted areas for waste storage?

Addressed Under: Storage/Transportation Issues

46. When you start to do this work, you're going to have to really coordinate with all the other operable unit people and make sure it all kind of falls and flows in together here.

Addressed Under: Removal Action Issues

47. So are you kind of looking at the attitude of we'll do the easiest ones first and see how it goes?

Addressed Under: Removal Action Issues

48. In your incinerator area there, are you primarily talking about high levels of soil contamination there or are you talking about high levels of equipment?

Addressed Under: Cleanup Standards

49. The soil washing technique is not here yet?

Addressed Under: Cleanup Standards

50. Once you have it in a box, is it shipped? Or would you, if you had a technology, wash the soil?

Addressed Under: Storage/Transportation Issues

51. In section 6 of the EE/CA, you're evaluating air quality impact and you're making an air quality impact assessment. You're using the industrial source complex model, which presumes that you have well-developed plumes. Can you expect that during D&D you're going to have well-developed plumes? And there's this double hump in each of the concentrations.

Addressed Under: Risk Assessment and Exposure Estimates

52. The industrial source complex model presumes that you have well-developed plumes. This document says that you have two isolated sources. And I don't understand how you tried to estimate conservatively when there wasn't any airborne data. If you look on table 6-6, you have to make adjustments where you didn't have airborne data based on the average alpha contamination level. You multiplied that by 10, and then you used the model with the two meter plume evaluation.

Addressed Under: Risk Assessment and Exposure Estimates

53. But you don't have a plume when you're doing D&D.

Addressed Under: Risk Assessment and Exposure Estimates

54. But it doesn't sound like this is an accident scenario.

Addressed Under: Risk Assessment and Exposure Estimates

55. It looks like there are two discrete sources.

Addressed Under: Risk Assessment and Exposure Estimates

56. How do you get that hump (on figure 6-2?)

Addressed Under: Risk Assessment and Exposure Estimates

57. You took the removal contamination numbers from each of the facilities that you had, then you modeled those. Then you summed them all up.

Addressed Under: Risk Assessment and Exposure Estimates

58. Where was your receptor at?

Addressed Under: Risk Assessment and Exposure Estimates

59. I still don't understand the humps.

Addressed Under: Risk Assessment and Exposure Estimates

60. But 6.3 comes out as 6.2 because 6.3 is just a dose and 6.2 is concentration.

Addressed Under: Risk Assessment and Exposure Estimates

61. When you had each source term for each of the 25, do you run those through the model separately?

Addressed Under: Risk Assessment and Exposure Estimates

62. Well, if you have old buildings and you've got a massive amount of dust collection on all the beams and everything, are they to be vacuumed first?

Addressed Under: Risk Assessment and Exposure Estimates

63. They don't contribute at all?

Addressed Under: Risk Assessment and Exposure Estimates

64. Looking at that same table, you're talking about Plant 7, the main building, the alpha contamination level is a factor of 6 lower than Plant 4-A. The thing that makes the difference apparently is the number of high efficiency particulate air filters.

Addressed Under: Risk Assessment and Exposure Estimates

65. You've also switched units because you've gone from microcuries per second to picocuries per second.

Addressed Under: Risk Assessment and Exposure Estimates

66. It makes it hard to make a comparison when you switch from microcuries to picocuries. So the comparison of those numbers that are 10 to the minus 3 is not that straightforward because you don't have any average alpha contamination levels for the old D&D building.

Addressed Under: Risk Assessment and Exposure Estimates

67. I understand it's a question of conservatism because you're trying to point out that neither workers nor residents are going to be impacted.

Addressed Under: Risk Assessment and Exposure Estimates

68. If you believe that this is a conservative estimate, I don't have a lot of confidence in the industrial source complex.

Addressed Under: Risk Assessment and Exposure Estimates

69. As a fugitive emission? Inhaled?

Addressed Under: Risk Assessment and Exposure Estimates

70. What I don't understand here, you have cubic feet per minute volume and you have a terrible variable in your cubic feet per minute volume to get your rate. How can you vary your rate so much and you don't see a lot of variation over here in this other table? What's the idea of cubic feet per minute volume?

Addressed Under: Risk Assessment and Exposure Estimates

71. The thing that is controlling the uncontrolled emission rate is the alpha contamination, and if you don't have the data, then you don't know what the uncontrolled emission rate is.

Addressed Under: Risk Assessment and Exposure Estimates

72. What kind of monitoring will you be doing as you do the work; will you have your real time monitors out there downwind so that you will pick up something you weren't expecting?

Addressed Under: Environmental Monitoring Issues

73. Would that be real time monitoring or would it be after the fact type monitors?

Addressed Under: Environmental Monitoring Issues

74. But for health and safety purpose, what about inhalation?

Addressed Under: Environmental Monitoring Issues

75. Is it written in this document anywhere that as you begin to dismantle these buildings, residents will be notified? Will there be any notification?

Addressed Under: Notifications

76. I just want it on the record the fact that people that live in the community do have the right to know what's happening, and that people should be notified.

Addressed Under: Notifications

Appendix 1

This appendix contains a more detailed explanation of the Industrial Source Complex model, which is addressed in question 52.

Response to Issues

ISSUE A: Is the use of the Industrial Source Complex model, appropriate?

The use of the Industrial Source Complex Long Term Model ISCLT2 model to assess the impact of the D&D activities proposed in the EE/CA, is considered to be appropriate since it is recommended by the EPA in the Guideline on Air Quality Models as the model of choice, for assessing long term average impacts of fine particulate matter such as that expected to result from the D&D activities and has been applied previously at the FEMP during the preparation of the Sitewide Characterization Report. EPA has conducted extensive validation studies which clearly document the conservatism of modeling studies conducted using ISCLT2.

The way in which the model was applied in the EE/CA is also very conservative. Starting assumptions are that the building will be kept under negative pressure during D&D operations using fans to draw air from the building. All exhaust will pass through HEPA filters before being vented to the atmosphere.

An air pathway analysis was conducted to quantify radiation exposure using the ISCLT2 model which allows input of multiple release points, each at a unique location. When using the ISCLT2 model the proper treatment of the vent releases is to treat them as point

sources, defined by the following input parameters:

- release height
- exhaust temperature
- exhaust velocity
- stackvent inside diameter
- location (x and y coordinates)

The building exhaust vents were conservatively assumed to have a release height of only 2 meters (the height of a man). The exhaust temperature was assumed to be equal to ambient conditions, thereby limiting the effect of thermal buoyancy. The exhaust velocity and vent diameter were set to values which eliminated momentum plume rise which would normally be expected to improve dispersion and therefore limit near-ground concentration of contaminants. The remaining model inputs for the FEMP are documented in the ISCLT2 output contained in Appendix G of the EE/CA.

The approach described above to model long term radiation levels is very conservative and will tend to overestimate actual impact for the following reasons:

1. The modeling was conducted using the EPA recommended model, ISCLT2 which has been proven to be conservative when applied in accordance with EPA protocol.

2. The source parameters were deliberately selected to produce the maximum impact.

ISSUE B: How were sources / release rates derived?

Predicting the concentration of contaminants in the air rising from the resuspension of contamination on floors and surfaces is difficult. The concentration depends on the type of

contaminant, the type of surface, and the activity taking place. Direct experience with radiation protection has demonstrated however, that air samples taken in radiologically contaminated areas are higher when work is going on (no matter what kind of work) than if the area is unoccupied.

Empirical factors (based on experience rather than theory) have been developed to estimate the concentration in the air if the amount of contamination on the surface is given. The use of these factors is based on the assumption that the amount of resuspension is proportional to the amount of surface contamination. A typical formula for computing the predicted air concentration follows:

Concentration in air (μCi/ml) = 4.5 E-7 x concentration on the surface (dpm/cm^2) x F

Here "F" is the resuspension factor (in units of cm-1), and 4.5 E-7 is a factor which converts dpm to microcuries. According to Cember[1] resuspension factors vary form 1 E-8 to 1 E-4. A value of 1 E-8 works well for Building 4A, i.e., 4.5 E-7 x 23.82 x 1 E-8 = 1.07 E-13. This compares to a measured average of 1.12 E-13. The lower value (i.e., 1 E-8) is probably due to the fact that the contamination is largely, uranium, which has a low specific activity, i.e., it takes a lot of uranium to make up a microcurie. (Note that 2382 dpm/100 cm^2 equals 23.82 dpm/cm^2).

The increase due to work activities must be compared to the work activity that was going on when the air samples were taken. The work which was taking place during sampling is estimated to be limited to light activities such as walking. During the process of D&D more vigorous activities would be expected. However, this increase would be offset somewhat because of local controls, and because areas would be cleaned up early in the D&D process. Fish[2] gives values for the resupension factor of 1 E-7 for light work such as sample collection, 4 E-7 for moderate work such as vigorous walking and 2 E-6 for work that disturbs the contamination itself, such as sweeping. On the basis of this documentation, a factor of between 4 and 20 is appropriate for the current application.

There are several common practices used to prevent generation of airborne contamination during D&D. These include the use of HEPA filtered vacuum cleaners, and the use of scabblers equipped with HEPA filtered exhaust. In addition, areas are often painted, or covered with plastic. In addition, work is sometimes done inside of a containment (plastic tent) with its own HEPA filtered ventilation system, all within the building being cleaned up.

In the EE/CA, a factor of 10 was assigned in estimating release rates. This is an assumed value that balances increased work activity against (1) local contamination controls, and (2), the knowledge that the average surface contamination now present will be systematically reduced during D&D, the emission rate being highest early in the D&D process, reducing to almost zero toward the end.

ISSUE C: How were the sources modelled? What are the relative contributions of the various sources.

The long term average spatial distribution of airborne radiation levels and dose were computed using the Industrial Source Complex Long Term (ISCLF2) model which allows input of multiple release points, each at a unique location as shown in figures 6-2 and 6-3 of the EE/CA. The contribution of each of the 25 structures addressed by the EE/CA, to the radiation levels at the points of maximum impact, are shown in Table 1 (for the southernmost "hump") and Table 2 (for the more northern "hump"). The major contributors at these locations (greater than 0.1 attocuries/m^3) are:

1. Plant 4, Miscellaneous Tanks
2. Old D&D Building - Building 69
3. Plant 7, Main Building
4. Plant 5, Warehouse (Thorium) - Building 65

As expected, these structures are also those having the highest release rates as shown in Table 6-6 in the EE/CA. They are also major contributors to the maximum predicted off-site concentration (Inhalation Dose) shown in Table 3.

TABLE 1
Location of Highest On-Site Impact
Receptor (699500,4352300)

Source	Predicted Radiation Level (attocuries/m3)	Predicted Dose (rems)
Plant 4, Miscellaneous Tanks	5.966073	1.36E-06
Plant 7 Main Building	0.257873	5.88E-08
Old D&D Building	0.051614	1.18E-08
Plant 5 Warehouse (Thorium)	0.009568	2.00E-08
PP Sump House	0.004798	1.09E-09
Plant 4 Maintenance	0.004572	1.04E-09
Harshaw Tower	0.004565	1.04E-09
Warehouse for Integrated Demolition	0.003762	8.58E-10
Thorium Warehouse	0.003036	6.35E-09
Incinerator Building	0.002730	6.22E-10
Thorium Warehouse	0.002426	5.07E-09
West Tank Farm	0.001390	3.17E-10
Magnesium Warehouse	0.001085	2.47E-10
PP Maintenance	0.000643	1.47E-10
Refrigeration Building	0.000527	1.20E-10
Incinerator at STP	0.000127	2.90E-11
Fire Training Area	0.000085	1.94E-11

TABLE 2
Location of Second-Highest On-Site Impact
Receptor (699700,4352600)

Source	Predicted Radiation Level (attocuries/m3)	Predicted Dose (rems)
Old D&D Building	3.562840	8.12E-07
Plant 4, Miscellaneous Tanks	0.201369	4.59E-08
Plant 5 Warehouse (Thorium)	0.176305	3.68E-07
Magnesium Warehouse	0.051982	1.19E-08
Plant 7 Main Building	0.029813	6.80E-09
PP Sump House	0.001650	3.76E-10
Warehouse for Integrated Demolition	0.001406	3.21E-10
Thorium Warehouse	0.001188	2.48E-09
Harshaw Tower	0.001090	2.49E-10
Thorium Warehouse	0.001054	2.20E-09
Incinerator Building	0.000691	1.58E-10
West Tank Farm	0.000471	1.07E-10
Fire Training Area	0.000437	9.96E-11
Plant 4 Maintenance	0.000345	7.87E-11
PP Maintenance	0.000210	4.79E-11
Refrigeration Building	0.000131	2.99E-11
Incinerator at STP	0.000081	1.85E-11

TABLE 3
Location of Highest Off-Site Impact
Receptor (699500,4352300)

Source	Predicted Radiation Level (attocuries/m3)	Predicted Dose (rems)
Old D&D Building	0.098442	9.83E-08
Plant 4, Miscellaneous Tanks	0.075819	7.57E-08
Plant 7 Main Building	0.015414	1.54E-08
Plant 5 Warehouse (Thorium)	0.009145	8.37E-08
Magnesium Warehouse	0.002686	2.68E-09
PP Sump House	0.000908	9.07E-10
Thorium Warehouse	0.000667	6.11E-09
Warehouse for Integrated Demolition	0.000464	4.63E-10
Harshaw Tower	0.000461	4.60E-10
Thorium Warehouse	0.000416	3.81E-09
Incinerator at STP	0.000307	3.07E-10
Incinerator Building	0.000282	2.82E-10
West Tank Farm	0.000255	2.55E-10
Fire Training Area	0.000188	1.88E-10
Plant 4 Maintenance	0.000163	1.63E-10
PP Maintenance	0.000109	1.09E-10
Refrigeration Building	0.000056	5.59E-11

ISSUE D: Why does the model show two distinct areas of relatively high concentration / dose (two "humps)?

As described in addressing Issue C, the plots in figures 6-2 and 6-3 of the EE/CA showing two "humps", superimpose the outputs for all of the 25 modelled sources. The "humps" correspond with the combined influence of the four largest sources. Their physical occurrence on the site is the result of a) the locations and magnitudes of the sources b) the dispersion assumptions - the orientation of the buildings, their height, proximity to each other etc. and c) the meteorological conditions (the prevailing wind direction is from the southwest and the centers of concentration appear downwind from the major sources). The southern focus reflects the contributions made by building 4a and 7, the more northerly, those of building 65 and 69.

ISSUE E: Demonstration of conservatism in the approach and confirmation of the insignificance of the problem.

The calculated exposure to radiological and other contaminants, of both onsite and offsite individuals during the D&D operations is extremely small. This is attributable to the many protective measures that will be taken to ensure that this is the case.

The greatest hazard from dust-like (fine particulate matter) contamination distributed on building and equipment surfaces at the FEMP arises if it becomes airborne and is inhaled. Since most of this material is in the buildings it is essential to prevent its release during D&D and several methods and engineering controls were described in the EE/CA to prevent the release of the contaminants from any given structure. The first, was the reduction of atmospheric pressure within the structure through the use of ventilation fans. Each fan is exhausted through a high efficiency particulate filter (HEPA filter), designed to remove 99.97 percent of the particles of the size which is most likely to be retained in the lung if inhaled. DOE requires that each HEPA be tested in place prior to first use to demonstrate that it meets or exceeds the percent removal requirement. There is also a requirement to monitor the performance of a HEPA filter during operation.

Secondly, with the building maintained under negative pressure, workers remove the loose contamination on accessible surfaces using cleanup equipment each equipped with its own HEPA filter, or by working inside a plastic tent with its own filtered exhaust. Then the process equipment is taken down, again with the air removed from the process equipment, passing through a HEPA filter before even being exhausted to the inside of the building. This pre-filtered air is again HEPA filtered before exhausting to the exterior. As a result of this rigorous filtered ventilation, the air leaving a building is 99.97 percent cleaner than the air inside. At a distance, following mixing with the ambient air, the concentration of radioactive contaminants is decreased even further.

All emissions simultaneously

To further exercise conservatism in assessing the impact of such exhausts, the modelling analysis described in Issues B and C was undertaken, in which it was assumed that all 25 structures would undergo simultaneous D&D. This established the worst case concentrations that could be seen at the various locations within the FEMP. To establish the significance of these concentrations, the dose from breathing them (Inhalation dose)was calculated by assuming that a person stood at the point of highest concentration for 2000 hours per year directly inhaling. His dose (total effective dose equivalent) is 0.011 mrem per year. In perspective, this dose is very small since the NCRP (National Council on Radiation Protection) reports that the average person in the United States receives an annual dose from all natural sources, of 300 mrem just from living on the earth.[3] The worst-case annual dose to a Fernald worker is some 27,000 times lower than this, and that to the most heavily exposed person offsite, several orders of magnitude lower yet.

good explanation

REFERENCES

1) Comber, Herman, Introduction to Health Physics, Pergamon Press, New York, NY, 1969, p321

2) Fish, B.R., et al, "Redispersion of "Settled Particulates", in Surface Contamination, Pergamon Press, New York, NY, 1964

3) NCRP 93, Ionizing Radiation Exposure of the Population of the United States, National Council on Radiation Protection Measurement, September 1, 1987, Bathesda, Maryland.