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Oregon Department of Energy
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Mr. Richard I. Smith, P.E.
1520 W. 9th Avenue
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Addressees:

ENGINEERING EVALUATION/COST ANALYSIS FOR THE 105-KE AND 105-KW REACTOR FACILITIES AND ANCILLARY FACILITIES

The U.S. Department of Energy, Richland Operations Office (RL) would like to thank you for your comments concerning the removal of buildings in the 100-K Area as described in the Engineering Evaluation/Cost Analysis for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities. RL has prepared a responsiveness summary (enclosed) which addresses the comments received. 0069831

In consideration of the engineering evaluation and comments received, and in conjunction with the U.S. Environmental Protection Agency, an Action Memorandum has been prepared to direct deactivation, decontamination, decommissioning, and demolition of the ancillary facilities and the Interim Safe Storage and long-term surveillance and maintenance of the reactor facilities located in the 100-K Area of the Hanford Site.

If you have any questions, you may contact me or your staff may contact Chris Smith, of my staff, on (509) 372-1544.

Sincerely,

Joe R. Franco

Joe R. Franco, Assistant Manager
for the River Corridor

AMRC:DCS

Enclosure

cc w/encl:
Administrative Record, H6-08
G. Bohnee, Nez Perce

Comments on DOE/RL-2005-86, Engineering Evaluation/Cost Analysis for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities
RESPONSIVENESS SUMMARY

Introduction

This responsiveness summary was prepared in accordance with the requirements of 40 CFR 300.820. The purpose of this responsiveness summary is to summarize and respond to public comments on the *Engineering Evaluation/Cost Analysis for the 105-KE and 105-KW Reactor Facilities and Ancillary Facilities*, DOE/RL-2005-86 (EE/CA), that was prepared by the U.S. Department of Energy (DOE).

The EE/CA, issued on June 14, 2006, evaluated alternatives for the non-time-critical removal action for the remaining buildings and structures, including the 105-K East (KE) and 105-K West (KW) Reactor Buildings, located in the 100-K Area of the Hanford Site. The preferred alternative identified in the EE/CA for the 105-KE and 105-KW Reactors and Ancillary Facilities was Interim Safe Storage (ISS) of the reactors followed by long-term surveillance and maintenance (S&M) and deactivation, decontamination, decommissioning, and demolition (D4) of the ancillary facilities and portions of the 105-KE and 105-KW Reactor Facilities.

Community Involvement

A public notice was placed in the *Tri-City Herald* on June 18, 2006, announcing the availability of the EE/CA and Administrative Record, and the start of the public comment period. A public comment period was held from June 19 through July 18, 2006. The fact sheet stated that a public meeting would be conducted if requested. No requests were received for a public meeting, therefore, no public meeting was held.

Comments and Responses

Three sets of comments were received from the public. The comments, along with responses from DOE and the U. S. Environmental Protection Agency (EPA), are presented below.

Commenter 1 -- Oregon

1. **Comment:** We support the proposed action to demolish and remove the facilities and cocoon the reactors, with the following important changes.

   Response:

   The agencies appreciate the time you have taken to review this document and provide your comments.

2. **Comment:** We have previously cautioned DOE about grouting the pick-up chutes - and particularly at K East - and that the dominant release of the fission products, uranium and plutonium from the site had occurred through the seam at the bottom of this chute. Prior to cocooning the reactor it is essential that this plug be removed, that the seam be excavated, and the leaked waste retrieved. We have further cautioned DOE that none of the costs of the removal of this monolith should weigh in the decisions associated with cleanup of these leaked wastes.

   Response:

   There are multiple programs and decision documents involved in the full clean-up of some of these facilities. In addition to this EE/CA for the Reactor and Ancillary Facilities, the K Basins Interim Action ROD addresses removal of the contents of the K Basins and the disposition of the K Basins themselves will be completed in accordance with the Remaining Sites Record of Decision (ROD). Thus, clean-up of the leaked wastes is not within the scope of this EE/CA. In accord with the Remaining Sites ROD, the soil beneath the basins including beneath the seam in the pick-up chute would be considered in the deep zone (greater than 15 feet depth below ground surface) and would be cleaned up to standards that are protective of groundwater and the Columbia River. This removal action won't interfere with the ROD work.

3. **Comment:** The EE/CA needs to be revised to make it clear to the contractor that the concrete installed in the pickup chute, the basin structure, and the leaked waste are all to be removed and/or exhumed prior to cocooning of the reactor structures.

   Response:

   It should be noted that the discharge chute was cleaned prior to adding the clean concrete "plug" and may not require removal to clean-up the leaked wastes. The basin structure will be removed in accordance with the Remaining Sites ROD. Also see the response to comment #2.

4. **Comment:** This will require extensive coordination with other program elements to ensure that the investigation of the fate of these and similar adjacent wastes are fully characterized and remediated prior to back-filling these areas and cocooning the reactor structures. The need for these actions is stated in Section 4.2.3. The discussion needs to be expanded and made explicit in this regard.

Response:

The agencies agree that close integration among the multiple programs and activities will be necessary to ensure that the ISS effort will contribute to the efficient performance of any remedial action. Also see the response to comment #2.

5. **Comment:** The contaminants of concern (COC) list in section 2.2.1 needs to be expanded to include the full suite of COC's for the 100-K Area, including but not limited to uranium isotopes, thorium, and carbon-14 as radioactive COC's; and uranium and thorium as toxic heavy metals. Uranium is the dominant COC for the 100-K Area. Both basins exhibit elevated levels of other mobile or volatile fission products that create surface contamination control problems. These need to be included as well.

   Response:

   As stated in Section 2.2.1 of the EE/CA, "the activities of individual isotopes are not currently known but will be determined, as needed, through data quality objective directed sampling and analysis tasks before disposal." It was also noted that the list was not intended to be all-inclusive ("In general, the primary contaminants of concern include the following radionuclides:"). The latest list of radioactive COCs does include those suggested.

6. **Comment:** During reactor operations, a variety of gases were blended and used to cool and protect the graphite core blocks. These gases became contaminated with carbon-14. The cover gases were scrubbed and disposed of by injection in wells immediately adjacent to the basins. Because carbon is a critical component of all living things, is highly mobile in the environment, and has a long half-life, it is essential that these sites be fully characterized and the carbon-14 be removed and remediated prior to completion of the EE/CA.

   Response:

   The commenter is correct that carbon-14 is a contaminant of concern that needs to be addressed in sampling and analysis plans and the appropriate removal or remedial action. Clean-up of the wells adjacent to the basins and the K Basins themselves will be in accordance with the Remaining Sites Record of Decision. Thus, clean-up of the wells is not within the scope of this EE/CA. Also, please see the responses to comments #2 and #5.

7. **Comment:** Section 3.0 remedial action objectives should be expanded to include protection of other potentially impacted biological resources, including bats and other creatures that may attempt to use the facilities during the course of these actions.

   Response:

   The need to protect biological resources (such as maternity bat roosts) was addressed in the action memo in section 5.3.3.4, Endangered Species and Migratory Birds.

8. **Comment:** Figure 4-4 is helpful, but does not clearly indicate whether the basins themselves are to be removed. The shading of the basin structure is different from other areas with no clear indication of what that means. This should be clarified to state that the basins will be removed.

   Response:

   Please see the response to comment number 2.

9. **Comment:** In Section 5.4.3.1 on Natural Resources details a list of "mitigating" actions. These are not mitigating actions. The word "mitigate" should be changed to "minimize" in this instance.

   Response:

   Under the Council of Environmental Quality regulations (40 CFR 1508.20), the term "mitigation" is a broad term that includes a variety of actions: (a) Avoiding the impact altogether by not taking a certain action or parts of an action; (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) Compensating for the impact by replacing or providing substitute resources or environments. The "mitigation" measures cited in section 5.4.3.1 of the EE/CA included some of these elements. However, the term "minimize" has been used, where appropriate, within this Action Memorandum to distinguish minimization actions from other types of mitigation efforts.

   The comment is correct and the term "minimize" has been used in this action memo.

10. **Comment:** Section 5.4.7 on Irreversible and Irretrievable (I and I) commitment of resources is inappropriately over broad and needs to be reduced to the commitments of fuel and materials needed to accomplish the actions, and the borrow materials used to back fill the site. An EE/CA is an inappropriate place to make claims or decisions on I and I beyond simple consumables. Further, the impacts and mitigations for ERDF are already fully covered in the decision documents for that facility and should not be restated here, other than referring the reader to those decisions. Decisions on residual contamination that may remain in the soil and groundwater are beyond the scope of the EE/CA and need to be removed. To accomplish these changes, we recommend deleting the first two paragraphs of this section, striking the word "also" in the first sentence of the third paragraph, and removing the entire last sentence in the third paragraph.

    Response:

    The commenter is correct in noting that decisions on residual contamination in soil and groundwater is beyond the scope of the EE/CA. It was not the intent of the EE/CA to identify the presence of this contamination as a commitment of resources. The commenter is also correct in noting that ERDF impacts are covered in other decision documents; however, the impacts were included in the EE/CA for completeness sake and for members of the public who may not be

aware of the previous determinations relating to commitment of resources at ERDF. This alternative also results in the use of geological materials from existing borrow sites/pits as required to backfill and recontour areas where contaminated soils or structures have been removed.

Commenter 2 -- Idaho

1. **Comment**: ERWM agrees that the selected alternative, Alternative II, is most appropriate of the three alternatives presented. This includes Interim Safe Storage (ISS) of KE and KW reactor blocks, followed by long-term surveillance and maintenance in conjunction with institutional controls for the duration of the ISS period until the reactor blocks are prepared and transported to the 200 Area for disposal. Alternative II, as we understand it, also includes deactivation, decontamination, decommissioning, and demolition of portions of the reactors plus the ancillary facilities.

   Response:

   The agencies appreciate the time you have taken to review this document and provide your comments. Please also note that removal of the reactor blocks is not included in this action memorandum. It is an expected future action as determined in a previous NEPA ROD. This action memorandum contributes to the efficient performance of that future action.

2. **Comment**: We are concerned, however, that the K-basins, which are part of the reactor building structures, are covered by the Remaining Sites ROD and thus are not part of this EE/CA. This concern centers around integration of efforts conducted on behalf of both the Remaining Sites ROD and the EE/CA for 105-KE and 105-KW Reactors.

   Response:

   By referencing the K Basins Interim Action Record of Decision (ROD) and the Remaining Sites ROD in the EE/CA, the intent was to identify the need for the integration that would be required between these actions. Tri-Party Agreement milestone M-016-57 requires DOE to initiate soil remediation at the K East Basin within one month after completing removal of the K East Basin structure.

3. **Comment**: ERWM is aware of the history of leaks from K-East basin to the underlying soil. When the floor of the basin was leaking, it was covered with sludge, known to be highly radioactive and to contain great quantities of transuranic isotopes. It is imperative that the contaminants which have leaked from the basins and the associated discharge chute are located and retrieved in conjunction with the ISS of the reactor.

   Response:

   The disposition of the K Basins will be completed in accordance with the Remaining Sites ROD and, thus, are not within the scope of this EE/CA. The remaining sites ROD requires that the soil beneath the basins be remediated to protect future use of the site as well as protect groundwater from contaminants that could leach from the vadose zone. Soil from beneath the construction joint in

the fuel discharge chute is believed to be contaminated and is subject to the remove-treat-dispose remedy specified in the remaining sites ROD.

4. **Comment**: The EE/CA contains the following troubling clause in the final paragraph of Section 1.1, Purpose and Scope: "In the event that large volumes of contaminated soil are encountered, other soil contamination sites are adversely affected by D4 activities, utilities of active facilities are impacted, or removal of contaminated soil inhibits D4 activities, the action memorandum may provide that removal of contaminated soils or structure (i.e., slab, below-grade structure) may be deferred to future remedial action with approval of the EPA." ERWM maintains that the K-East basin contaminant issue has been adequately identified by DOE and EPA. It is clearly a threat to the groundwater and the river. Soil remediation should be coordinated with the ISS of 105-KE Reactor, and as such this soil contamination should not be "deferred to future remedial action with the approval of the EPA".

   Response:

   The intent of this clause in the EE/CA was to provide a mechanism for dealing with newly discovered contaminated soil that would be beyond the scope of the building deactivation, decontamination, decommissioning, and demolition (D4) efforts envisioned by this EE/CA and to allow deferral to a more appropriate remedial action document. As noted in the response to comment #3, the contaminated soil under and around the K Basins will be removed in accordance with the Remaining Sites ROD.

5. **Comment**: Sections 2.1.4 and 5.4.3.2 – Cultural Resources: The EE/CA indicates a cultural resources review will be performed in compliance with the requirements of NHPA and DOE/RL 1996 (programmatic agreement). Our ERWM Hanford cultural resource personnel anticipate reviewing this report when it is completed. If cultural resources are encountered, the NPT-ERWM expects to be consulted to determine appropriate actions for mitigation, resource documentation, or recovery.

   Response:

   You will be consulted by DOE to determine appropriate actions for mitigation, resource documentation, or recovery if cultural resources are encountered during the cultural resources review. The ERWM Hanford cultural resource personnel will be provided with the review when it is completed by DOE. It should be noted that the proposed removal action would occur in previously disturbed areas; therefore, the likelihood of encountering cultural resources during the removal action would be low. However, as noted in 5.4.3.2, "if cultural resources are encountered, the State Historic Preservation Office and Native American tribes would be consulted to determine appropriate actions for mitigation, resource documentation, or recovery."

6. **Comment**: Section 3.0 – Removal Action Objectives: Bullet 2 – In order to encompass the value to protect the environment and do no further harm, this

bullet should read "Prevent the migration of contaminants...", rather than "Control the migration of contaminants…"

Response:

The commenter is correct that the regulatory language from CERCLA states an objective is to "mitigate or prevent the substantial threat of a release," rather than "control." The intent of the phrase in the EE/CA was to indicate the special precautions that would be taken during the removal action to ensure contaminants are controlled. At the end of the removal action, soils are either certified as meeting the cleanup requirements contained in the remaining sites ROD or stabilized and addressed as a remedial activity.

Commenter 3 -- Richland, WA

1. **Comment**: The one major cost element not considered in this and in the previous Interim Records of Decision for the other old reactors is the cost of final removal and disposal for the stored blocks in the somewhat distant future. While these final costs are essentially the same for any of the alternatives considered for near-term action, the magnitude of those future costs may be the elephant in the living room when considering the total cost for removal and disposal of the reactor blocks. DOE will have to come up with the funding for those deferred costs when the time comes, and those costs will not be trivial. It might be well to revisit the analyses presented in the EIS for the Surplus Production Reactors, to see whether the selected disposal alternative is still the better choice.

   Response:

   The agencies appreciate the time you have taken to review this document and provide your comments. It is true that the costs to perform the final action on the reactors, after ISS and long-term S&M, are not included in this EE/CA, and costs could be very large. The regulatory paths for making final disposition decisions for the reactors are still being evaluated.

2. **Comment**: While the cost analysis results were presented in great detail, there are no bases presented to show how those costs were derived. I would have thought that there would be a lot of data available from those reactors already put into interim safe storage to illustrate what those actual costs were and how these costs for the K-Reactors were actually estimated. Furthermore, there are no references to documentation of the costs for placing the older reactor blocks into interim safe storage. There are no detailed discussions or references to such detailed analyses of the work required. As a result, the numbers are interesting but there is no basis for confidence in the cost numbers presented.

   Response:

   The estimated costs are based on the actual costs for performing interim safe storage at five of Hanford's surplus reactors over the past 7 years and information obtained during facility walk downs and review of drawings. The requested information is provided in the Surplus Reactor Final Disposition Engineering Evaluation (DOE/RL-2005-45) which was placed in the Hanford site administrative record in September 2005 (available at

www2.hanford.gov/arpir/common/findpage.cfm?AKey=DA00913933 and made available for public review along with the EE/CA. The engineering evaluation reviews the original assumptions and information contained in the Surplus Production Reactors Final Environmental Impact Statement (EIS) and ROD, including cost estimates and radiological inventories. A status of the DOE's progress to date implementing ISS for the surplus reactors and cost estimates for completion of ISS for all nine surplus reactors (including N Reactor) is presented. The applicable cost estimates and dose estimates presented in the Final EIS are updated to reflect current values and estimates.

3. **Comment**: In addition to the lack of any detailed descriptions of the physical actions required to complete placement of the reactor blocks into safe storage, there is no description or discussion of the radiation doses associated with the remedial actions postulated in this EE/CA. Again, I would have thought that there would be ample data from the previous cleanup/safe storage operations at the older reactors to provide bases for reasonable estimates for the K-Reactors. The data from those earlier actions should be documented somewhere, and those documents should be referenced in this report.

   Response:

   As noted in the response to comment #2, the requested information is provided in the Surplus Reactor Final Disposition Engineering Evaluation (DOE/RL-2005-45) which was made available for public review with the EE/CA as part of the administrative record.

4. **Comment**: In general, the evaluations of the CERCLA criteria presented in Chapter 5 are not evaluations at all. Instead, they are generalized arguments unsupported by any evidence. If actual evidence were presented for comparison, the conclusions drawn might very well be different. For example, what are the expected cumulative radiation doses to workers from now until start of the final removal and disposal of the reactor blocks for both alternatives?

   Response:

   The evidence requested is provided in the Surplus Reactor Final Disposition Engineering Evaluation (DOE/RL-2005-45). Please also note the response to comment number 2. The EE/CA contained summaries of this information.

5. **Comment**: I found references to the Interim Action Record of Decision for the older production reactors, but did not see any references to any analyses supporting those decisions. If they exist, they should also be referenced in this document.

   Response:

   The supporting analysis for the Interim Action Record of Decision for the older production reactors is provided in DOE/EIS-0119F, Final Environmental Impact Statement, Decommissioning of Eight Surplus Production Reactors at the Hanford Site, December 1992, which can be found in the administrative record (see http://www2.hanford.gov/arpir/common/findpage.cfm?AKey=D196136488).

6. **Comment**: Table ES-1, footnote D4, last term should be demolition, not decommissioning.

   Response:

   Comment noted.

7. **Comment**: Table 4-4: the capitalization of the terms in the footnotes D4 and S&S is inconsistent with all of the other similar footnotes on similar tables.

   Response:

   Comment noted.