Hanford Waste Management Area C WIR Evaluation
8-30-18 DOE-NRC Teleconference Summary

Department of Energy (DOE) Attendees: Sherri Ross (DOE-HQ), Jan Bovier (DOE-ORP)

Nuclear Regulatory Commission (NRC) Attendees: David Esh, Hans Arlt, Lloyd Desotell, Richard Chang, Maurice Heath

DOE Contractor Attendees: Marcel Bergeron (WRPS), Doug DeFord (WRPS), William McMahon (CH-PRC), Sunil Mehta (INTERA), Matt Kozak (INTERA), David Watson (PNNL), Paul Rutland (WRPS), Keith Quigley (Veolia)

Member of the Public Attendees: None

The following topics regarding NRC's review of the Draft Waste Incidental to Reprocessing (WIR) Evaluation for Closure of Waste Management Area C at the Hanford Site were discussed during an August 30, 2018 teleconference. This teleconference was open to the public. The call-in information for this teleconference was posted on the following DOE Hanford webpage: https://www.hanford.gov/page.cfm/WasteManagementAreaC

1. DOE stated that the "white space" on pages 4-78 and 4-80 of the draft WIR evaluation (DOE/ORP-2018-01, Draft D) is the result of a format issue, there is no text that is missing from these pages. The end of each sentence in question should be "…Table 4-10."

2. NRC noted that the inventory provided in Table 2-5 of the draft WIR evaluation (page 2-67) and in the Performance Assessment (PA) document (RPP-ENV-58782, Rev 0), for Tank C-301, 244-CR Vault, and the pipelines does not match the values in the GoldSim system model. DOE stated that the inventory included in the GoldSim system model is correct and consistent with information presented in Table 3-15a of the PA document. [The pipeline inventory in the system model is a combination of residual inventory of the pits, diversion boxes, and waste transfer pipelines.] It was noted by DOE that the entries for C-301, the CR-Vault, and pipelines in Table 4-3 of the PA document, which is used as a basis for Table 2-5 in the WIR, are not consistent with Table 3-15a and will need to be updated.

3. The geometry of the residual waste in the pits and diversion boxes was discussed. DOE stated that they believe the assumption for the geometry of the residual waste in the pits and diversion boxes is bounding. DOE noted that access to the pits is good, and as such, the assumption was reasonable. DOE stated that page 3-121 of the PA document provides additional discussion of the pits and diversion boxes.

4. NRC noted that the GoldSim model contains the isotope Pb-210 but no inventory is assigned to it. DOE stated that the Pb-210 initial inventory has not been estimated as mentioned in Section 4.1 of the PA document but will in-grow in the system model over time from decay of U-238 and U-234. DOE stated that Pb-210 is relatively immobile and does not believe it to be a risk significant radionuclide. DOE indicated that, if requested, an initial inventory of Pb-210 could be estimated. NRC indicated that a revision was not needed at this time but future revisions of the model should include Pb-210 for completeness.

5. NRC noted that while not risk significant, the value for the minimum Pu Kd provided in Table 6-5 of the PA document does not agree with the value in the GoldSim model. DOE noted that this value did not get rounded (a technical editing oversight) and they will change the PA Table 6-5 to match the value in the model.

6. NRC noted that on page 6-71 of the PA document the table indicates the saturation of the residual waste layer is 1 but the model includes air in the residual waste layer. The porosity of the in-fill grout is given as 0.269 but in the model it is assigned a value of 1. The porosity of a number of other materials are given in the document but assigned a value of 1 in the model. NRC indicated that DOE should review the model to ensure this approach is consistent with the model's calculation of the tortuosity term. DOE indicated that saturation could vary over time but complete saturation of the residual waste layer was assumed to maximize the diffusive flux across the base of the tank along the tortuous aqueous phase pathway. However, in order to also diffuse the volatiles along the air pathway minor air phase was added in the residual waste layer. The porosity is being set to 1 because the porosity term is included as part of the tortuosity parameter (to calculate effective diffusion coefficient using the model of Millington and Quirk (1961)) and therefore the value is set to 1 to avoid double multiplication.

7. NRC noted that the value for longitudinal dispersivity provided in Table 6-10 of the PA document (page 6-95) does not match the value used in the GoldSim system model. DOE indicated that some of the GoldSim model terms have been adjusted so that its output matches the output of the 3-D STOMP model, which is the primary modeling tool for compliance calculation for the groundwater pathway. NRC indicated that this approach should be reflected in the PA document. DOE indicated that first paragraph on p. 8-33 of PA document provides this information.

8. NRC noted that the text on page 6-95 of the PA document indicates that only the upper 5 m of the aquifer was considered as a mixing zone, but the GoldSim model appears to use the full saturated thickness of 12 m. DOE stated that the 3-D STOMP model calculates concentration over the full saturated thickness of the unconfined aquifer and concentrations from upper 5 m were chosen for compliance calculations. The STOMP model results indicate that the concentration of radionuclides at 100-m boundary do not vary significantly throughout the aquifer. For the GoldSim based system model, average

saturated thickness of 12 m (representative for 100-series tanks) is applied to be consistent with the results of 3-D STOMP model.

9. NRC noted Table 6-16 on page 6-111 of the PA document indicates that the H2 sand layers had a middle portion consisting of 20 GoldSim cells but the GoldSim model has 80 cells. DOE indicated that the text on p. 6-107 (line 22) of the PA document correctly describes the implemented grid discretization but Table 6-16 is incorrect and should be updated.

10. NRC noted that the Henry's Law Constant for tritium on page 6-123 of the PA document may be too high. NRC indicated that this value should be reviewed and possibly revised. DOE indicated that they can do some sensitivity cases with different values but the choice was made to maximize the diffusive flux along the air-pathway.

11. NRC noted that in Table 6-22 on page 6-137 of the PA document the reference for soil ingestion that is different from the reference provided in Table 6-28 on page 6-149. DOE indicated that they will update the document to be consistent.

12. NRC noted that the version history on page 9 of the PA document lists the date of Rev. 0 as occurring before Draft B. DOE indicated that this was a typo and the document will be updated.

13. NRC noted that they would like to discuss, in addition to the climatic information presented in DOE's documents, plausible future scenarios based on the uncertainty of future hydrogeologic and climatic conditions, and the ability and flexibility of DOE's performance assessment to incorporate such scenarios on future teleconferences. DOE indicated that there is some discussion of climate change on page 3-21 of the PA document. The information is then used in developing uncertainty in recharge rates (Table 8-3).