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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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August 30, 2010

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EDMC

Mr. Jose Franco, Assistant Manager
Richland Operations Office
United States Department of Energy
P.O. Box 550, MSIN: A7-50
Richland, Washington 99352

Re: 1607-D2:2, Replacement Drain Field, Waste Site Reclassification Form

Dear Mr. Franco:

The Department of Ecology (Ecology) approves the Waste Site Reclassification Form 2009-036 and Attachment for the 1607-D2:2. We request the United States Department of Energy's (USDOE) response to our proposal to modify work (submitted in accordance with Hanford Federal Facility Agreement and Consent Order [HFFACO] Article XXX) listed on page 2. Ecology also requests that USDOE revise the Remaining Sites Verification Package according to our comments (enclosure), with the exception of the comments regarding additional remediation at the site.

Ecology agrees that interim standards for remediation have been met per the requirements of *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, DOE/RL-96-17, Revision 6 (Work Plan). Based on our review of the sampling data, we believe that additional cleanup could be required at this site under the final Record of Decision (ROD) for the 100-D Area. Therefore, we request that this site not be backfilled. Ecology submits this request in accordance with HFFACO Article XXX, *Additional Work or Modification of Work.* Article XXX requires Ecology to describe its proposed modification to work, and requires USDOE to respond within 30 days.

Lead regulatory agency concurrence is required to authorize site backfill (Work Plan, Section 3.1.2) and backfill is required to meet HFFACO interim milestone M-016-47. Ecology is strongly recommending against backfill at this time. We are prepared to provide relief from the portion of M-016-47 interim milestone requiring backfill and revegetation in order for the sites to remain open.

M-016-47 Ref# 00833806

003006E3

To address current work plan requirements, Ecology proposes the following specific modifications for the 1607-D2:2 waste site.

Existing requirement:

"Excavations are backfilled so that sites conform to local topography" (Work Plan, Section 3.12., last sentence).

Proposed Modification:

The 1607-D2:2 waste site will not be backfilled as part of the interim remedial action, and backfill requirements will be deferred to the final ROD. The Waste Information Data System (WIDS) will document this agreement.

Existing Requirement:

"After a site has been demonstrated to have achieved cleanup levels and RAOs, the site will be backfilled with clean materials and revegetated in accordance with approved plans," (Interim Action ROD 100 Area Remaining Sites, page 36).

Proposed Modification:

The 1607-D2:2 waste site will not be backfilled as part of the interim remedial action, and backfill and revegetation requirements will be deferred to the final ROD. WIDS will document this agreement.

Existing Requirement:

"The completion of the 100 Area Interim response actions includes:

- Remediation of all waste sites and EPA/Ecology approval of associated closeout verification packages.
- Backfill and re-vegetation of the waste sites.
- Decontamination and decommissioning of all ancillary facilities," (HFFACO Change Request M-16-01-05, April 24, 2002).

Proposed Modification:

The 1607-D2:2 waste site will not be backfilled as part of the interim remedial action, and backfill and revegetation requirements will be deferred to the final ROD. WIDS will document this agreement.

Our assessment that remediation at this site is incomplete is based on the relative frequency at which 1607-D2:2 sample results exceed WAC 173-340 (2007) remedial action goals for human health and ecological risk. In addition, WAC 173-340 (1996) remedial action goals (as shown in Work Plan tables B-2 and/or-3) were exceeded, for which USDOE substituted modeling. This is allowed under the Work Plan; however, the modeling approach currently used will not be accepted by Ecology for final decisions. Therefore, Ecology believes that if the 1607-D2:2 waste site is backfilled and revegetated now, USDOE risks having to re-excavate the site in the future.

As required by HFFACO Article XXX, USDOE will submit a written evaluation of the impact (cost and schedule for re-excavating this site) to Ecology, in the event that USDOE does backfill the site.

If there are any questions, contact Nina Menard at 509-372-7941.

Sincerely,

Jane A. Hedges
Program Manager
Nuclear Waste Program

nm/lkd
Enclosure

cc w/enc: Stuart Harris, CTUIR
Gabriel Bohnee, NPT
Russell Jim, YN
Susan Leckband, HAB
Ken Niles, ODOE
Administrative Record: 100-D RDR/RAWP
Hanford Operating Record General File
Environmental Portal
USDOE-RL Correspondence Control

Document Review of
Cleanup Verification Package for the 1607-D2:2 Replacement Drain Field
(CVP for 1607-D2:2)

Reviewers: Jacqueline Seiple, Beth Rochette, Noe'l Smith-Jackson – Washington State Department of Ecology
Scott Van Verst – Washington State Department of Health

Date: December 17, 2009

General Comment:

1. The following issues are noted for 1607-D2:2 and provide the basis for the recommendation that additional remediation is required at this site. Washington Administrative Code (WAC) 173-340 1996 and 2007 cleanup levels are exceeded for a number of contaminants primarily at sample location 8, but also at several other sample locations. Contaminants include nitrate, which cannot be addressed via RESidual RADioactivity (RESRAD) modeling. Contaminants that exceed WAC 173-340 (1996) cleanup levels include barium, chromium, copper, mercury, silver, zinc, Aroclor-1254, and Aroclor-1260. Contaminants that exceed WAC 173-340 (2007) cleanup levels include hexavalent chromium, mercury, silver, zinc, nitrate, aroclor-1254, and aroclor-1260. The recommendation for further remediation supersedes our specific comments.

   - **Pg. 13, Table 1 and pg. A-21:** Mercury exceeds the soil concentration protective of the river (which defaults to background for both the 1996 and 2007 WAC 173-340 calculations). The WAC 173-340 3-Part Test is failed for all parts of the 3-Part Test, due to exceedances at sample locations 2 and 8.

   - **Pg. C-10, Table C-6:** The in-process data show that mercury exceeds the soil concentration for protection of groundwater as well as the values for protection of plants and soil biota.

   - **Pg. A-20, Attachment 1:** Aroclor-1254 and 1260 exceed cleanup levels (1996 and 2007) at sample location 8. Sample 8 exceeds a hazard index of 1 for contaminants that are toxic to the gastrointestinal (GI) system for the soil to groundwater pathway. This sample also exceeds a hazard quotient of one for Aroclor-1254, which causes the hazard index to exceed 1 for ocular toxins. This is 10% of the samples locations.

   - **Pg. A-22, Attachment 1:** The nitrate values from the first sampling, though analyzed past the holding time, were used for Evology's calculations because it is unlikely that the values would increase (rather than decrease) over time. Nitrate is a nutrient that could be consumed or reduced as the sample ages. The values were converted from nitrate values to N values. Based on these data, the site fails the 3-part test for nitrate using the values for soil for protection of groundwater from WAC 173-340 (2007). The cleanup level is exceeded at a number of locations, and greater than 10% exceed the cleanup level and one sample exceeds 2X the cleanup level (location 7). Even using the nitrate data from Method 353.2, the cleanup level is exceeded at several locations.

   - **Pg. A-21, Attachment 1:** Silver exceeds the cleanup level (1996 and 2007) for river protection at sample location 8. In addition, the concentration at sample location 8 is greater than two times the cleanup level.

- **Pg. A-21, Attachment 1:** Zinc exceeds the cleanup level (1996 and 2007) for river protection at sample locations 4 and 8. The 3-Part Test is failed for 10% of dataset above the cleanup level (locations 4 and 8) and for a sample concentration greater than two times the cleanup level (sample location 8).
- **Pg. A-20, Attachment 1:** The duplicate sample for J18057 (location 2), Sample 5 and Sample 10 exceed the soil cleanup value for protection of groundwater (0.2 mg/kg using a Kd of 0 mL/g with WAC 173-340 Equation 747-1 (2007)) for hexavalent chromium. Consequently, these results cause exceedence of a hazard index of one for contaminants that are toxic to the kidney. These three samples account for greater than 10% of the locations sampled, so the data set does not pass the WAC 173-340-740 3-part rule for hexavalent chromium. It is recognized that two of these were at the detection limit, so for these two the values were divided by two for calculating the hazard index for the kidney.
- **Pg. A-20 to A-29, Attachment 1:** The following are exceeded for ecological protection (WAC 173-340 Table 749-3):
  - Barium for the protection of wildlife (as acknowledged in the text).
  - Boron for protection of plants in all samples (this has been acknowledged in the text).
  - Mercury for protection of plants and soil biota at 20% of sample locations; the two locations also exceed 2X the value for protection of soil biota; the statistical result also exceeds the values for plants and soil biota (Table 1, p. 13).
  - Silver for protection of plants at 10% of the locations.
  - Zinc for protection of plants at 10% of the locations and the statistical result (Table 1, p. 13).

Specific Comments:

1. **Table ES-1, pg. ES-2, Groundwater/River Protection – Radionuclides:** The text states that RESRAD modeling predicts that Cs-137 will not migrate to groundwater or the river within 1,000 years, with a reference to footnote "c." Footnote "c" indicates that the generic RESRAD modeling was performed. This is inconsistent with the Unit Managers Meeting (UMM) agreement (100/300 Area UMM, November 8, 2007) to perform waste site specific RESRAD modeling for radionuclides per the 100 Area Remedial Design Report/Remedial Action Work Plan (RDR/RAWP). Please perform this modeling and attach the calculation brief (without attachments) or use the cleanup level for Cs-137 shown in RDR/RAWP (DOE/RL-96-17, Rev 6).

2. **Table ES-1, pg. ES-3, Groundwater/River Protection – Nonradionuclides:** The text states that three nonradionuclide constituents of potential concern COPCs were above RAGs, including chromium, copper, and zinc. This is inconsistent with Table 1, which shows eight nonradionuclides above cleanup levels, including barium, chromium, copper, mercury, silver, zinc, Aroclor-1254, and Aroclor-1260. Please correct the statement and ensure that the document is consistent.

3. **Executive Summary, pg. ES-3:** The text states, that ecological risk screening levels were exceeded for barium, boron, cadmium, manganese, silver, vanadium, and zinc. Screening levels were also exceeded for antimony (<background) and mercury. Add this to the text.

4. **Executive Summary, pg. ES-3:** The text states that selenium concentrations exceeded background and will be evaluated further. This is not consistent with the information in Table 1 or Appendix B. Please delete selenium from the text.

5. **Executive Summary, pg. ES-3:** Change text to recognize that there is no "site" background for some contaminants, including cadmium and antimony, and add a reference to the Ecology Publication #94-115, "Concentrations of antimony, cadmium, manganese, and vanadium are below Hanford site or Washington State background levels" (DOE-RL 2001, Ecology 1994).

6. **Section 1.0 Statement of Protectiveness, pg. 1, para 2:** See comments #3, 4, and 5 on ecological risk and adjust text accordingly.

7. **Section 3.1 Excavation and Disposal, pg. 5:** The text states that the excavation is approximately 7 ft deep. The waste site reclassification form (WSRF) states the excavation is a maximum depth of 10 ft. Please include a range for the depth of remediation in the text.

8. **Section 5.0 Sampling Results, and Table 1, pg. 12-13:** The text and table indicate comparison of cleanup levels to a statistical result. However, Appendix A, pg. A-5 and A-6, indicates that the maximum result was used for some contaminants. Please add text to explain this and change the column heading in Table 1.

9. **Section 5.0 Sampling Results, pg. 12, 2nd para:** In addition to the 95% upper confidence level (UCL), the components of the 3-part test in WAC 173-340-740 (Compliance monitoring) need to be satisfied. Appendix A indicates that the other two parts of the 3-Part Test is failed for some contaminants. Add discussion here regarding whether or not there were any samples exceeding 2X the cleanup level, and whether or not less than 10% of the sample concentrations exceed the cleanup level.

10. **Table 1, footnote "b":** The footnote states that the generic RESRAD model was used to predict that the contaminant would not reach groundwater. This is inconsistent with the UMM agreement (100/300 Area UMM, November 8, 2007) to perform waste site specific RESRAD modeling for radionuclides per the 100 Area RDR. Please perform this modeling and attach the calculation brief (without attachments) or use the cleanup level for cs-137 shown in DOE/RL-96-17, Rev 6.

11. **Section 6.1, pg. 14:** Edit the sentence as shown:

    "Evaluation of the results listed in Table 1…that all COC/COPCs were undetected or quantified below RAGs an lookup values or shown to meet the RAOs for the site as a result of RESRAD modeling."

12. **Section 6.3.1 Groundwater and Columbia River Remedial Action Goals Attained, pg. 15, and Appendix A, pg. A-37, Methodology:** In Section 6.2, the text addresses the risk calculations shown in Appendix A for direct contact; however, no text is included to discuss the risk calculations for protection of groundwater, as including in Appendix A, pg. A-35. Please add the following as 4) in the calc brief Methodology section (Appendix A, pg. A-37): WAC 173-340-740(3)(a)(ii)(A) (1996) provides the "100 times rule" but also states "unless it can be demonstrated that a higher soil concentration is protective of ground water at the site." When the "100 times rule" values were exceeded, RESRAD was used to demonstrate that higher soil concentrations may be protective of groundwater. Please add this statement or a similar one to Section 6.3.1 on p. 15.

13. **Appendix A, pg. A-6, Uranium-233/234 and Uranium 238:** It is not clear why the "95% UCL Result" in the "Results Summary Excavation" table are listed as zero, when Table 1 and pg. A-7 indicate the 95% UCL to be 0.823 and 0.907 pCi/g for U-233/234 and U-238, respectively. Please clarify.

14. **Appendix A, pg. A-7, Barium:** The table shows that barium fails the WAC 173-340 3-Part Test for: Any Sample >2X Cleanup Limit. This is not addressed in the text discussion on sampling results or data evaluation in Sections 5.0 or 6.0. Discuss this in the text.

15. **Appendix A, pg. A-8, Copper:** The table shows that copper fails the WAC 173-340 3-Part Test for: Any Sample >2X Cleanup Limit. This is not addressed in the text discussion on sampling results or data evaluation in Sections 5.0 or 6.0. Discuss this in the text.

16. **Appendix A, pg. A-10, Mercury:** The table shows that mercury fails all three parts of the WAC 173-340 3-Part Test. This is not addressed in the text discussion on sampling results or data evaluation in Sections 5.0 or 6.0. Discuss this in the text.

17. **Appendix A, pg. A-9, Zinc:** The table shows that zinc fails all three parts of the WAC 173-340 3-Part Test. This is not addressed in the text discussion on sampling results of data evaluation in Sections 5.0 or 6.0. Discuss this in the text.

18. **Appendix A, pg. A-22, 1607-D2:2 Verification Sampling Results – Anions**: Footnote c and the data quality assessment (DQA) state that due to an excessive sample holding time exceedance prior to analysis, all samples for anions (EPA method 300.0) were recollected, and that the data sets (included on Page A-22) are not used for closeout and are presented for information only. If the holding time was exceeded for all anions (bromide, chloride, fluoride, nitrate, nitrite, phosphate, and sulfate) per method 300.0, why haven't all results been qualified as rejected? Only bromide, fluoride, and nitrite have been unanimously rejected for all Sample Areas. Please clarify and add text to the DQA.

19. **Appendix A, pg. A-23, 1607-D2:2 Verification Sampling Results – Anions:** The recollected data for all analytes in method 300.0 are located on page A-23. The applicable footnote e states that this set of samples (collected on 5/4/2009) is used to evaluate the subsite for closeout. However, the 95% UCL calculation (shown on page A-9) for nitrate are for the samples collected on 12/16/2008, analyzed per method 353.2, not the nitrate results of method 300.0 collected on 5/4/2009. If the recollected nitrate data from method 300.0 was not intended to be used for closeout, this should be clearly stated with the basis. Furthermore, the 300.0 data for bromide, fluoride, nitrite, and phosphate have not been evaluated in the 95% UCL calculation or listed in the Results Summary Excavation on Page A-6. Explain why the data for these four anions have not been statistically evaluated. Please clarify and add text to the DQA.

20. **Appendix A, pg. A-5, A-7, A-18, A-19, for radionuclides:** The document states that for radionuclide data, calculation of the statistics is done using the reported data. However, the results presented are confusing. On pages A-18 and A-19, in many cases where the data are flagged as U (undetected), the analyte concentration and the minimal detectable activity (MDA) are the same number, so it appears that the MDA was simply substituted for the value reported. It is therefore not clear if there is a value reported for these cases. For radionuclides, the laboratory reported value should be given in all cases. In addition, on page A-7, the statistical computation input data for Cs-137 is set to one-half the MDA value, in contrast to the statement that the reported value is used. Please correct this issue.

21. **Appendix A, pg. A-21, mercury**: Footnote b states that a second set of samples for mercury was collected on 4/15/09 and 4/16/09. And that the second mercury sample set is used for site closeout. However, the data that has been provided in the statistical evaluation for mercury is what was shown on page A-21 from 5/4/2009; not the second set of mercury samples that was referenced in the footnote. See the summarization table below.

Sample Location	HEIS Number	Sample Date	Result Listed on Page A-21 (Attachment 1)	Result Listed on Page A-10 (Statistical Calculation)
2	J18PT7	5/4/2009	0.383	0.383
Duplicate of J18PT7	J18PV6	5/4/2009	0.332	0.332
1	J18PT6	5/4/2009	0.0285	0.0285
3	J18PT8	5/4/2009	0.0284	0.0284
4	J18PT9	5/4/2009	0.0585	0.0585
5	J18PV0	5/4/2009	0.0271	0.0271
6	J18PV1	5/4/2009	0.0259	0.0259
7	J18PV2	5/4/2009	0.0500	0.0500
8	J18PV3	5/4/2009	1.24	1.24
9	J18PV4	5/4/2009	0.0471	0.0471
10	J18PV5	5/4/2009	0.0234	0.0234

Furthermore, it does not make sense that a second set of samples (i.e.; a resampling) would be done prior to the initial set of samples. The 4/15/09 and 4/16/09 resample dates are prior to 5/4/09. That timeline does not make sense, as resampling occurs after the initial sampling date. Also, a basis for the resampling should be included in the footnote. Please clarify and correct as necessary.

22. **Table B-1, pg. B-2:** It does not appear that footnotes "d", "e", or "f" were used. Therefore, please remove these footnotes.

23. **Table B-1, pg. B-2:** There are ecological risk screening levels for polychlorinated biphenyls (PCBs). Therefore, please include these in the table.

24. **Appendix E, pg. E-1, section E1.1, first paragraph, second sentence**: The text states that the hold time exceedance for anions resulted in a rejection of most of those data by third-party validation. Why were only "most" of the data rejected instead of "all" of it? Please either correct the statement, or provide the technical justification. See comment #18 and 19.

25. **Page E-1, section E1.1, first paragraph, last sentence**: The text states that the project opted to abandon the mercury data along with the rejected nitrite, chloride, and phosphate data. The statement does not appear to be accurate because the 5/4/09 mercury data, which evidently exceeded the hold time, is what appears in the 95% UCL calculation brief. Furthermore, no qualifiers have been applied to that mercury data to show that they have been rejected due to a hold time issue. The footnote documents that a second set of samples for mercury was collected on 4/15/09 and 4/16/09 (with no basis provided). And as stated previously, the 4/15/09 and 4/16/09 mercury data have not been provided in the WSRF. See also comment #21.