SGW-59926
Revision 0

Briefing to Ecology on LLWMA-1, NRDWL, and 183-H Updated RCRA Groundwater Monitoring Plans, January 19, 2016

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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APPROVED
By Julia Raymer at 11:08 am, Jun 22, 2016

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MEETING NOTES

Briefing to Ecology on LLWMA-1, NRDWL, and 183-H Updated RCRA Groundwater Monitoring Plans, January 19, 2016

Attendees:

Doug Hildebrand (DOE-RL)

Zelma Jackson (Ecology)

John Temple (Ecology)

Stuart Lutrell (Ecology)

Tim Mullin (Ecology)

Elis Eberlein (Ecology)

Dwayne Crumpler (Ecology)

Dib Goswami (Ecology)

Craig Arola (CHPRC)

Greg Thomas (CHPRC)

Bill Faught (CHPRC)

Jessica Ni (CHPRC)

Prepared by: Bill Faught

Where: Ecology Office, Conference Room 31, 3100 Port of Benton Blvd, Richland

Date: January 19, 2016

Objective: Discuss Ecology comments on the following three (3)-draft groundwater monitoring plans:

- Low-Level Waste Management Area 1 (LLWMA-1),
- Nonradioactive Dangerous Waste Landfill (NRDWL), and
- 183-H Solar Evaporation Basins.

Materials Distributed:

The following materials were provided to Ecology and EPA prior to the meeting:

Introduction

Bill Faught (CHPRC) began the meeting by stating the purpose of the meeting was to provide draft responses to Ecology comments on the LLWMA-1, NRDWL, and 183-H groundwater monitoring plans, and to discuss the responses. The goal is to focus on Ecology comments that were either not accepted or partially accepted.

Low-Level Waste Management Area 1 (LLWMA-1) (DOE/RL-2009-75 Draft Rev. 1)

1. Comments #6, #7 and #8:

    a. Greg Thomas (CHPRC) stated that the rate of migration through the vadose zone is very dependent on the effective porosity for response to Comments #7 and 8.

        i. Stuart Lutrell (Ecology) asked if Greg Thomas could show him where the effective porosity fits into the equation used to calculate travel time through the vadose zone.

        ii. Greg Thomas stated that the equations used are presented in an appendix in the reference cited in the comment response (WHC-SD-WM-TI-730)

        iii. Stuart Lutrell responded that he would review the information in the reference.

        iv. No change needed to Comment #7 and 8 response (pending review of reference information by Stuart Lutrell.

    b. Elis Eberlein (Ecology) questioned why dioctyl-phthalate is listed in the comment response to Comment #6, since it is not a dangerous waste.

        i. Doug Hildebrand (DOE) responded that if it is not a dangerous waste then it should not be included in the text. It was agreed that dioctyl phthalate will be removed from the text. (Note: upon further review it was discovered that there had been a typographical error. The chemical that was disposed at LLWMA-1 is di-octyl phthalate (CAS# 117-84-0) and should be identified as a dangerous waste. Therefore, the only change to the document and RCR is to change “dioctyl phthalate” to “di-octyl phthalate”.)

        ii. Doug Hildebrand also clarified the inclusion of lead. 3 “packages” of lead were included in the site, 2 of which will still be designated as dangerous waste, and 1 of which will not continue to be designated as dangerous waste. A letter

summarizing the lead issue is expected to be forthcoming related to the “Green Islands” portion of LLWMA-1.

iii. Heather Sulloway (CHPRC) asked whether reference to the letter should be included in the plan.

iv. Bill Faught suggested that a footnote with reference to the letter be included in the section related to Comment #6 since the letter will go into the Administrative Record.

2. Stuart Lutrell relayed a question related to the same section of the plan as Comment #9. Stuart questioned whether this site is going to be closed under interim status requirements.

   a. Elis Eberlein stated that the plan should reference WAC regulations (173-303-645) and not Federal regulations (40 CFR 265) since the site is under an overall Final Status RCRA permit. This comment would apply to other interim status sites such as NRDWL.

   b. Doug Hildebrand stated that the site will ultimately be dispositioned as part of the SW-2 OU.

   c. Dwayne Crumpler (Ecology) stated that there is currently no CERCLA OU decision documentation for the 200 East vadose or groundwater OUs (BP-5, EA-1, or SW-2), and that LLWMA-1 cannot be dispositioned under RCRA alternative requirements until the CERCLA decision documents are available.

   d. Doug Hildebrand stated the current plan is to monitor under RCRA

   e. The response to Comment #9, which removed discussion of the Permit schedule, was accepted.

3. Comment #10

   a. Stuart Lutrell questioned the value of the proposed new well location particularly the ability of the downgradient well to monitor Trench 9. Also based on ongoing discussions, boundary of unit may change in the future.

   b. Doug Hildebrand recommended deferring discussion of WMA boundary for today’s discussion, and removing the well from the well from the plan based on the uncertainty of the future boundary.

   c. Stuart Lutrell stated that the well could have value at least for measuring the water table in this area.

d. Greg Thomas (CHPRC) stated that the well would also provide needed geologic information.

e. Jeff Ayres (Ecology) and Stuart Lutrell agreed to that Ecology would discuss whether to include the well in the plan and provide an answer to DOE in about a week.

4. Comment #12

a. Elis Eberlein stated that Hanford has a final status permit and that all RCRA regulated units at the Hanford Site are under this permit

b. Doug Hildebrand disagreed since his understanding is some of the sites are intended to go from interim status to closure and not go into final status.

c. Bill Faught asked for clarification from Elis Eberlein.

d. Elis Eberlein re-iterated that the LLWMA-1 is under a final status permit and other interim status sites are included per conditions in the permit

e. Bill Faught stated that interim status sites will be getting letters to move into final status from Ecology, per Cheryl Whalen (Ecology).

f. Elis Eberlein stated that ultimately landfills will be under 200-SW-2 and RCRA alternative requirements. Closure could be deferred to CERCLA actions at that time. This could mean that we don't need wells right away at the point of compliance (POC).

g. Dwayne Crumpler (Ecology) stated that wells in the CERCLA monitoring typically cover an area of concern rather than an individual TSD.

h. Stuart Luttrell stated that his understanding of the regulations is that you must have a release from the TSD in order to use alternative closure requirements.

i. Craig Arola (CHPRC) asked the group that given the discussion, is the revised plan the groundwater monitoring plan we should move forward with.

j. Doug Hildebrand stated that yes, we should move forward with the revised RCRA monitoring plan.

k. With respect to critical means Doug Hildebrand stated that much of the contamination detected under LLWMA-1 groundwater plumes from

cribs to the south and from the B Complex area (e.g., BY Cribs). Doug suggested consideration be given to intra-well statistics.

i. Stuart Luttrell (Ecology) stated that intra-well statistics can only be used for final status sites.

ii. Greg Thomas (CHPRC) stated that under 40 CFR 265, upgradient wells need to be representative, and should re-calculate critical means to be representative.

iii. Dwayne Crumpler (Ecology) stated that 40 CFR 265 discussed initial background not ongoing recalculation of background.

iv. Greg Thomas (CHPRC) stated that there is an EPA guidance document (EPA530/SW-86/055) that discusses recalculating background concentrations.

v. Bill Faught (CHPRC) suggested that DOE provide a regulatory basis to Ecology for re-calculating critical means based on changing upgradient conditions.

vi. Dwayne Crumpler (Ecology) stated that he would re-read the regulations and provide his interpretation.

vii. Greg Thomas mentioned that certain sections of the unified guidance discuss re-calculating the background concentrations.

viii. Dwayne Crumpler (Ecology) stated that the critical question is does the unified guidance apply to interim status sites.

ix. Bill Faught suggested CHPRC and DOE develop a “position or white paper” supporting recalculation of critical means based on changing upgradient conditions.

l. Bill Faught asked the group whether we should move forward with the revised RCRA groundwater monitoring plan or develop some other plan. The group agreed that we should continue with a revised RCRA monitoring plan.

Dib Goswami (Ecology) stated that Ecology should review some other vadose zone travel time calculations in documents other than the previously discussed WHC-SD-WM-TI-730 to understand vadose zone transport in this area.

Non-Radioactive Dangerous Waste Landfill (DOE/RL-2015-32 Draft Rev. 0)

1. Comments #2 and #9 are similar to LLWMA-1 Comment #12 and will be dispositioned similar to LLWMA-1 Comment #12, when it is resolved.

2. The information in comment #3 box will be deleted

3. Comment #4. Doug Hildebrand stated that the environmental assessment (EA) for NRDWL/SWL, as a combined/single unit, went out for public comment in Rev. 9 of the permit and comments were received. Comments received have not been addressed.

    a. Comment #4 disposition accepted and the plan will not discuss coordination with CERCLA.

4. Comment #5. Stuart Luttrell accepted the disposition.

5. Comment #6. Stuart Luttrell accepted the disposition. As a general note Stuart Luttrell stated that final status requirements not identified in 40 CFR 264, but rather in WAC 173-110, including analytical requirements, identified methods, as stated in original Ecology comment.

6. Current text in comment #10 text block will be deleted.

7. Comment #11. Doug Hildebrand suggested that the response be clarified that is relevant to version 8C of the Hanford RCRA permit.

    a. Stuart Luttrell suggested modifying the last few lines of the comment disposition to discuss that the site will continue under interim status requirements until permitted. If needed, this change should be applied to other interim status plans.

8. Comment #12. Elis Eberlein questioned what constituents are being discussed since there is a long list including VOCs etc. that are relevant to NRDWL.

    a. Craig Arola clarified that the particular text is only discussion Specific Conductance.

    b. Elis Eberlein stated that response acceptable but clarify the text is discussing specific conductance.

9. Comment #14. Add similar language as suggested by Stuart Luttrell for Comment #11.

183-H Solar Evaporation Basins (DOE/RL-2015-28 Draft A)

1. Comment #73. Dwayne Crumpler (Ecology) stated that since nitrate is associated with the initial waste placed in the unit, nitrate should be monitored as a dangerous waste indicator.

    a. Heather Sulloway (CHPRC) stated that the rationale of removing nitrate from the plan in that nitrate itself is not a dangerous waste.

b. Doug Hildebrand stated that if a compound like cadmium-nitrate was the substance put into the site, shouldn't cadmium be monitored for and not nitrate?

c. Dwayne Crumpler responded nitric acid was also disposed of and the remaining product in groundwater is nitrate. Under 173-645 a site needs to monitor for constituents associated with a release. The same would apply to monitoring sulfate as a by-product of a sulfuric acid release.

d. Doug Hildebrand responded that if we monitor for nitrate we would believe nitrate is still in the vadose zone. There have been no detections for nitrate above the DWS in groundwater the last 2 years.

e. Dwayne Crumpler stated that the last 2 years are not representative due to low river stages overall during the last 2 years. Dwayne stated that he originally thought that nitrate groundwater sampling was covered by the CERCLA monitoring plan but changed his mind due to the disposal history of 183-H.

f. The group agreed to add nitrate to the plan as a dangerous waste with a concentration limit of 45 mg/L.

g. Heather Sulloway asked whether a 3 year monitoring period, to be conducted after nitrate concentrations were below 45 mg/L, would be included. Draft A of the plan had included a 3 year monitoring period for total chromium, to be conducted after concentration were less than 48 ug/L. This is a requirement under WAC 173-303-645(7)(c). Dwayne Crumpler (Ecology) agreed that the 3 year monitoring period would also apply to nitrate.

2. Comment #74. Dwayne Crumpler stated that comment should have used 20 ug/L as units instead of mg/L. This groundwater plan should use a consistent cleanup level as the 100-HR-3 ROD, not 100 ug/L. The cleanup value in the 100-HR-3 ROD is expected to be 48 ug/L. The MTCA state value for total chromium is 50 ug/L.

   a. After discussion, the group agreed to change to the concentration limit for total chromium (collected as a filtered sample) in the groundwater monitoring plan to 48 ug/L.

3. Comment #77. Same resolution as Comment #73.

4. Comments #79 and #90. Same resolution as Comment #74. Dwayne Crumpler requested that the groundwater monitoring plan cite 48 ug/L and the basis, and not reference the permit. Heather Sulloway explained that because the RCRA permit must be modified to include this plan (and the updated concentration limit) in order for the plan to take effect, that referencing the

updated total chromium (filtered) concentration limit in the permit (which will be 48 ug/L) within this revised plan is appropriate. The text for these comments and throughout the document will be updated to include 48 ug/L as the concentration limit for total chromium (filtered).

5. Comment #63. Heather Sulloway stated that Table 2.2 is intended to provide the applicable requirements from the regulation and then identify what section of the document the requirements are addressed at the site-specific level. The compliance period discussion specific to 183-H is provided in Section 3.4. Section 3.4 currently states that the compliance period will end after hexavalent chromium concentrations are less than 48 ug/L, and have remained less than 48 ug/L for 3 additional years of monitoring. The same condition will then apply for nitrate with a concentration limit of 45 mg/L.

    a. Dwayne Crumpler stated that the compliance period should be the period of operation plus 25 years. Since operations of the 183-H ended in 1997, the compliance period would end around 2022. For 7a in Table the year should be 2022.

    b. Heather Sulloway stated that in the current draft of the plan, the compliance period is based on the total chromium (filtered) concentration being less than 48 ug/L, not a designated number of years.

    c. Dwayne Crumpler stated that note 7c from the table would become effective after the 25 year period in note 7a.

    d. Bill Faught stated that CHPRC would get a regulatory opinion on the compliance period.

6. Dwayne Crumpler noted that on page 3-2, the end of the compliance period for total chromium (filtered) was based on attaining 48 ug/L, not 100 ug/L which was the proposed concentration limit. Heather Sulloway acknowledged this had been the agreement from the previous meeting. Agreement at this current meeting will now change the total chromium (filtered) concentration limit to 48 ug/L.

7. Comment #66. Dwayne Crumpler requested that the 48 ug/L value be used as the concentration discussed for Comment #74. The total chromium concentration limit is now based on the MTCA cleanup level and is no longer based on a chromium background value. Heather Sulloway will remove discussion of a background value for total chromium from the plan.

8. Comment #13. Dwayne Crumpler was fine with response.

9. Dwayne Crumpler agreed to review the “accept with modification” responses and provide input back to DOE as to whether the responses are acceptable or not.

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Appendix A

Handout: Review Comment Record (RCR) for DOE/RL-2009-75, Draft Rev. 1; Interim Status Groundwater Monitoring Report for LLBG WMA-1, and

16-NWP-022, Re: Resolution of Ecology Comments on DOE/RL-2009-75 Draft Rev. 1, Interim Status Groundwater Monitoring Plan (Plan) for the Low Level Burial Grounds (LLBG) Waste Management Area-1 (WMA-1)

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
11/09/2015	
3. Project No. LLBG WMA-1	Page 1 of 5

5. Do Document Number(s)/Title(s)	Project Name:	Reviewer Names:	8. Organization/Group	9. Location/Phone
DOE/RL-2009-75 Draft Rev 1 / Interim Status GW Monitoring Plan for the LLBG WMA-1		Elis Eberlein Stuart Luttrell Jeff Ayres	Ecology Ecology Ecology	372-7881 372-7883 372-7906

	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	Date / Reviewer/Point of Contact (print and sign) / Author/Originator (print and sign)	Date / Reviewer/Point of Contact (print and sign) / Author/Originator (print and sign)

Item	12. Page/ Line	13a. Comment/Discrepancy (Provide technical and/or regulatory justification)	13b. Recommended Change	14. Accept or Reject	15. Disposition (Provide justification if **NOT** accepted)	16. Status
1	p. 3-1, lines 8-10	"this RCRA interim status GW monitoring plan will be replaced according to a schedule ... " This is incorrect. The GW monitoring plan will be submitted with the complete permit application. The Gls present in this landfill will not be "clean closed" so the permit application has to assume landfill closure and fulfill all the requirements associated with that.	(Any recommended changes were included in the comment)	Accept	Text revised to remove discussion of the Permit schedule and clean closure.	
2	Page 2-8/ Figure 2-1	The gravelly sand colored green has no specific legend information. What does the green indicate? The depth of basalt at well E32-4 needs to have a "?" or something indicating it is estimated, because the well did not penetrate to the basalt depth.		Accept	Added sediment nomenclature and description as provided for other units in legend. Added "?"s to indicate local basalt depth is estimated.	
3	Page 2-10/ Figure 2-3	The depth of basalt at wells E32-4, E28-28, and E28-27 need to have a"?" or something indicating it is estimated, because the well did not penetrate to the basalt depth.		Accept	Added sediment nomenclature for 9C unit and description as provided for other units in legend. Added "?"s to indicate local basalt depth is estimated.	
4	Page 2- 12/ Figure 2-5	The depth of basalt at three wells need to have a "?" or something indicating it is estimated, because the well did not penetrate to the basalt depth.		Accept	Added "?"s to indicate local basalt depth is estimated.	
5	2-20/2.6/ 38-40 and Figure 2-10	It is suggested that leached waste "…is probably still within the trench or the adjacent sediments beneath the burial trench, as depicted in Figure 2-10." Figure 2-10		Accept	Text and figure revised. The reference to the "depiction in Figure 2-10" is removed from sentence. The vertical line is removed from figure.	

REVIEW COMMENT RECORD (RCR)	1. Date 11/09/2015	2. Review No.
	3. Project No. LLBG WMA-1	Page 2 of 5

Item	12. Page/ Line	13a. Comment/Discrepancy (Provide technical and/or regulatory justification)	13b. Recommended Change	14. Accept or Reject	15. Disposition (Provide justification if **NOT** accepted)	16. Status
		does not indicate the location of leached waste beneath a trench. What is the vertical straight line under the trench?				
6	2-22//8-9	Figure 2-10 does not provide the information stated in this sentence.		Accept	Figure 2-10 is used for 2 conceptual models. First, it is used to evaluate cesium-137 as a surrogate for lead where possible large volumes of water may have been applied. Second, it is used to define the expected dangerous waste contaminant migration from the bottom of Trench 9. Last sentence of Section 2.6.1 modified as provided. Red type identifies text addition, "Figure 2-10 provides a generalized visual depiction of the expected state of dangerous waste contaminant migration from the bottom of Burial Trench 9 (note Figure 2-10 identifies Trenches 1 and 2 as surrogates for cesium-137 migration as discussed earlier in this section, but also is used for the conceptual migration of Trench 9 for dangerous waste components, lead and di-octyl phthalate). [Note: A typo was identified in the document and this response. "dioctyl phthalate" should have been "di-octyl phthalate". This RCR and the groundwater monitoring plan text are corrected to "di-octyl phthalate".]	
7	2-22/2.6.2/30-34	This seems to present a different argument regarding vadose zone transport than does the NRDWL plan. I need to understand more completely.		Accept	Red type identifies text addition to address items 7 and 8, "Using the more conservative precipitation infiltration rate estimate (e.g., 5 cm/yr) and a minimum depth to groundwater of 73.4 m (241 ft), model results suggest a range between 115 and 129~~61~~ years are required for gravity-drained, precipitation-driven pore water to first reach groundwater from the bottom of the burial trench (DOE/EIS-0391, Table N-2 and WHC-SD-WM-TI-730, Figure 4-19). The migration of leached contaminant pore water in the model result is based on fixed boundary conditions of the waste site to	

REVIEW COMMENT RECORD (RCR)	1. Date 11/09/2015	2. Review No.
	3. Project No. LLBG WMA-1	Page 3 of 5

Item	12. Page/ Line	13a. Comment/Discrepancy (Provide technical and/or regulatory justification)	13b. Recommended Change	14. Accept or Reject	15. Disposition (Provide justification if **NOT** accepted)	16. Status
					groundwater, constant infiltration rate (precipitation), and three hydraulic conductivity values for three vadose zone layers as a function of moisture content. Using an average moisture content of 0.087 yields travel time similar to the 129 year travel time result by the model for the arrival of the peak concentration at the groundwater (WHC-SD-WM-TI-730, Figure 4-19). Considering that the initial buried waste has currently been in contact with natural pore water for up to 60 years, possibility of additional moisture added to the site, and variability of geologic sediments, uninhibited contaminant migration could have reached groundwater. Per 16-NWP-022, *Resolution of Ecology Comments on DOE/RL-2009-75 Draft Rev 1, Interim Status Groundwater Monitoring Plan for the Low Level Burial Grounds (LLBG) Waste Management Area-1 (WMA-1)* (February 9, 2016), more recent information regarding vadose zone travel time (e.g., *Tank Closure Waste Management Environmental Impact Statement*, DOE/EIS-0391) is cited. The following red-type text is added to last sentence of preceding paragraph: "Using the more conservative infiltration rate (5 cm/yr) and ignoring less permeable silt-dominated horizons such as the CCU_z, a conceptual model of pore water vertical transport is provided in the next paragraph below. Note the use of 5 cm/yr converges with the rate of recharge condition developed for *Draft Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*, DOE/EIS-0391."	

REVIEW COMMENT RECORD (RCR)	1. Date 11/09/2015	2. Review No.
	3. Project No. LLBG WMA-1	Page 4 of 5

Item	12. Page/ Line	13a. Comment/Discrepancy (Provide technical and/or regulatory justification)	13b. Recommended Change	14. Accept or Reject	15. Disposition (Provide justification if **NOT** accepted)	16. Status
8	2-22/2.6.2/30-34	The travel time calculation seems to be in error. A velocity of 5 cm/yr equates to .05 m/yr. It would take approximately 1,400 yrs to travel to groundwater under the conditions stated.		Accept	Additional text added as discussed in item 7.	
9	3-1/3.0/7-12	The idea of a "schedule" in the Permit will need to have some discussion. Apparently, compliance schedules will not be allowed in the final permit.		Accept	Text revised to remove discussion of the Permit schedule.	
10	3-1/3.2/33-35	What is the basis for the location of the new well? First, is the objective to provide another monitoring well for the entire LLWMA-1 or the portion of Trench 9 that contains dangerous waste? Also, how was the location decided - some statistical approach (MEMO), information from historical groundwater chemistry distribution and contaminant movement, professional judgment, or a combination?		Accept	Text added to address the rationale for the new proposed well, "The proposed well location is based on the current flow direction with respect to Trench 9, as shown in Figure 1-2. This location also provides sufficient coverage for the flow direction variability over the past 4 years, since the flow direction change." Per 16-NWP-022, *Resolution of Ecology Comments on DOE/RL-2009-75 Draft Rev 1, Interim Status Groundwater Monitoring Plan for the Low Level Burial Grounds (LLBG) Waste Management Area-1 (WMA-1)* (February 9, 2016), Ecology agrees with the planned groundwater monitoring well location identified in the Draft Rev 1 plan.	
11	3-1/3.2/40-42	I would exercise caution using the word "immediately," especially in view of the distance of the planned well to the location of the dangerous waste disposal.		Accept	Removed the word "immediately."	
12	4-1//23-27	Interim status requirements at 40 CFR 265.93(b) states the statistical comparisons are, " ... with its initial background arithmetic mean." Interim status requirements do not provide for updating the background mean, which final status requirements allow. Either LLWMA-1 should be operating under a final status plan to implement this approach (updating the background mean), or it should be in an alternate monitoring program described in 40 CFR 265.90 (d).		Not Accepted	As described in Section 4.2, "The background statistical analysis is updated annually to establish comparative values for indicator parameters. A rolling mean is used because of changing upgradient concentrations and groundwater flow conditions." [modified template language] Annual review and evaluation of critical means is performed as stated in 16-ESQ-0027, January 27, 2016 Letter from DOE to ECY, "*Response to Inspection Report Groundwater Operation and Maintenance Dangerous Waste*	

REVIEW COMMENT RECORD (RCR)	1. Date 11/09/2015	2. Review No.
	3. Project No. LLBG WMA-1	Page 5 of 5

Item	12. Page/ Line	13a. Comment/Discrepancy (Provide technical and/or regulatory justification)	13b. Recommended Change	14. Accept or Reject	15. Disposition (Provide justification if **NOT** accepted)	16. Status
					Compliance Inspections on May 19, 20, 21, and 27, 2015, at the Hanford Site, Resource Conservation and Recovery Act (RCRA) Site ID: WA7890008967, Nuclear Waste Program (NWP) Compliance Index Nos. 15.521 thru 15.533 (15-NWP-174)", p. 5: "Critical means and initial means values for every TSD network will be reviewed and evaluated every year. Recalculation of these values will be in accordance with the U.S. Environmental Protection Agency "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance," EPA 530/R-09-007, dated March 2009." ~~DOE-RL will review and evaluate the need to recalculate the critical mean annually. Causes to recalculate the critical mean include; substantive changes in groundwater flow direction, impacts (on the RCRA facilities) from existing regional dissolved phase groundwater plumes, and local sub-regional vadose zone impacts to groundwater that bias the upgradient monitoring wells in the network to be non-representative of groundwater conditions near the RCRA facility.~~	
13	Page 2-22, Line 41	Is the "10 to 65.8 percent" mentioned the percentage of silt in the soil matrix or is it the total percentage of the formation within the column?		No change needed	It is the percentage for the unit based on sieve analysis as described in the text. No change needed.	

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DEPARTMENT OF ECOLOGY
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711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

February 9, 2016 16-NWP-022

Mr. R. Doug Hildebrand
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: A5-11
Richland, Washington 99352

Dear Mr. Hildebrand:

Re: Resolution of Ecology Comments on DOE/RL-2009-75 Draft Rev 1, Interim Status Groundwater Monitoring Plan (Plan) for the Low Level Burial Grounds (LLBG) Waste Management Area-1 (WMA-1)

The Department of Ecology (Ecology) reviewed the United States Department of Energy – Richland Operations Office (USDOE-RL) response to Ecology's comments on the LLBG WMA-1 Plan.

- Ecology agrees with the planned groundwater monitoring well location identified in the Plan.

- Ecology recommends USDOE review and cite more recent information regarding vadose zone travel time (for example, the Tank Closure Waste Management Environmental Impact Statement DOE/EIS-0391).

If you have any questions, please contact Jeff Ayres, Hydrogeologist, Cleanup Section, at jeff.ayres@ecy.wa.gov or (509) 372-7881.

Sincerely,

Deborah Singleton
Waste Management Section Project Manager
Nuclear Waste Program

cc: See page 2

cc electronic:

Dave Bartus, USEPA
Dennis Faulk, USEPA
Mike Collins, USDOE-RL
Bill Faught, CHPRC
Jon Perry, MSA
Environmental Portal
Ken Niles, ODOE
Hanford Facility Operating Record
USDOE-RL Correspondence Control
Deb Alexander, Ecology
Jeff Ayres, Ecology
Dib Goswami, Ecology
Stuart Luttrell, Ecology
Deborah Singleton, Ecology
Ron Skinnarland, Ecology
John Temple, Ecology
Cheryl Whalen, Ecology

cc:

Rod Skeen, CTUIR
Gabriel Bohnee, NPT
Rex Buck, Wanapum
Russell Jim, YN
D. Rowland, YN
Administrative Record
NWP Central File
NWP Reader File

Appendix B

Handout: Review Comment Record (RCR) for DOE/RL-2015-32, Draft Rev. 0; RCRA Interim Status Groundwater Monitoring Report for Nonradioactive Dangerous Waste Landfill

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REVIEW COMMENT RECORD (RCR)

1. Date	2. Review No.
10/26/2015	
3. Project No. Nonradioactive Dangerous Waste Landfill	Page 1 of 7

5. Document Number(s)/Title(s)	Project Name:	Reviewer Names:	8. Organization/Group	9. Location/Phone
DOE/RL-2015-32, Draft Rev. 0; RCRA Interim Status Groundwater Monitoring Plan for the Nonradioactive Dangerous Waste Landfill		Elis Eberlein Stuart Luttrell Jeff Ayres	Ecology Ecology Ecology	372-7881 372-7883 372-7906

	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	Date / Reviewer/Point of Contact (print and sign) / Author/Originator (print and sign)	Date / Reviewer/Point of Contact (print and sign) / Author/Originator (print and sign)

Item	12. Page/ Line	13a. Comment/Discrepancy (Provide technical and/or regulatory justification)	13b. Recommended Change	14. Accept or Reject	15. Disposition (Provide justification if **NOT** accepted)	16. Status
1.	Pg 2-5, Line 26	This line refers to the NRDWL and SWL as "two TSD units." This is incorrect and needs correction. SWL and NRDWL were planned to be incorporated into one document but, the SWL was never a TSD.	(Unless otherwise noted, any recommended changes were included in the comment)	Accept	Changed “TSD units” to “sites”.	
2.	Pg 4-1, Para 4.2	Updating the background statistical analysis is performed annually. Interim standards do not allow for this. An alternate monitoring program should be established.		Not Accepted	As described in Section 4.2, "The background statistical analysis is updated annually to establish comparative values for indicator parameters. A rolling mean is used because of changing upgradient concentrations and groundwater flow conditions." [modified template language] Annual review and evaluation of critical means is performed as stated in 16-ESQ-0027, January 27, 2016 Letter from DOE to ECY, “*Response to Inspection Report Groundwater Operation and Maintenance Dangerous Waste Compliance Inspections on May 19, 20, 21, and 27, 2015, at the Hanford Site, Resource Conservation and Recovery Act (RCRA) Site ID: WA7890008967,*	

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					Nuclear Waste Program (NWP) Compliance Index Nos. 15.521 thru 15.533 (15-NWP-174)", p. 5: "Critical means and initial means values for every TSD network will be reviewed and evaluated every year. Recalculation of these values will be in accordance with the U.S. Environmental Protection Agency "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance," EPA 530/R-09-007, dated March 2009." ~~DOE RL will review and evaluate the need to recalculate the critical mean annually. Causes to recalculate the critical mean include; substantive changes in groundwater flow direction, impacts (on the RCRA facilities) from existing regional dissolved phase groundwater plumes, and local sub-regional vadose zone impacts to groundwater that bias the upgradient monitoring wells in the network to be non-representative of groundwater conditions near the RCRA facility.~~	
3.		~~Stuart Luttrell Comments~~			Deleted per Ecology instruction at January 19, 2016 meeting.	
4.	P. 1-1	(Comment is identified as a Hold Point on the Ecology RCR.) The text states: "Closure of NRDWL will be coordinated with the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) as part of the 200-SW-1 Soil Operable Unit (OU). Groundwater cleanup will be addressed under the 200-P0-1 Groundwater OU decision documents."	(Information below was provided under "Disposition" column on the Ecology RCR.) Remove the reference to coordination with CERCLA.	Accept	As agreed with Ecology at the April 19, 2016 meeting, discussion of future unit closure and reference to current/recent closure plan(s) will be removed from the document. Information from early closure plans (prior to 2005) may be used and referenced as needed for supporting/historical information of the unit.	

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		According to our TPA Section Manager, this is not consistent with the schedule to close the NRDWL and SWL by 9/30/22 (TPA Milestone M-037-12). That date is well before any CERCLA decision would be in place. Also, the statement is vague - if it did apply, what are the details of the coordination?			~~The first sentence is deleted. This removes discussion of coordination of closure with CERCLA.~~	
5	2/2.7/2-5	The sentence indicates the objectives of the groundwater monitoring program at NRDWL is, " ... ,complying with applicable RCRA requirements for interim status TSD units where no impact to groundwater has been identified." The scope of a groundwater monitoring program under 40 CFR 265 Subpart F encompasses more than monitoring a TSD where "no impact to groundwater has been identified." Monitoring programs under RCRA include the possibility of assessment (compliance), corrective action, and post-closure monitoring. Please remove the last part of the sentence "where no impact to groundwater has been identified."		Accept with Modification	Text is intended to specify that this NRDWL plan addresses the specific 40 CFR 265 requirements applicable to a site where no impact to groundwater has been identified. Text revised for clarity: "This groundwater monitoring plan addresses specifically those applicable RCRA requirements for interim status TSD units where no impact to groundwater has been identified."	
6.	2-17/ Footnote 10	Incorrect analysis list was cited. The "Groundwater Monitoring List" Appendix IX of 40 CFR 264 is replaced (at 173-303-110(7)) with Appendix 5 of *Chemical Testing Methods for Designating Dangerous Waste,* Ecology Pub. #97-407, revised December 2014. Correct this citation or clarify why the Appendix IX list was cited. We can agree that RCRA clean closure is not an option for this site, so why is the statement made, " ...that NRDWL would have to satisfy for RCRA clean closure." Please remove this phrase or provide more information that puts this in context.		Accept with Modification	Appendix IX of 40 CFR 264 was used in the 2009 groundwater assessment plan (SGW-40274) in order to be consistent with the final status requirements in WAC 173-303-645. ECY Pub #97-407 was not identified in SGW-40274. Footnote 10 revised to clarify that the discussion of 40 CFR 264, Appendix IX is a quotation from SGW-40274: "As a conservative measure, SGW-40274 states that the first determination groundwater samples were analyzed for the organic compounds of "40 CFR 264, Appendix IX, in order to be consistent with final status requirements within WAC 173-303-645.""	

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					Text "that NRDWL would have to satisfy for RCRA clean closure," is deleted.	
7.	2-27//36-38	This statement asserts just one transport mechanism - soil vapor. The discussion of pore volume on page 2-28 does not account for heterogeneity and preferential pathways of flow that may be established. Clastic dikes are one potential cause of preferential pathways, and have been mapped at the northwest comer of the Central Landfill.		Accept	The text has been revised to include a discussion of the impact of geologic heterogeneity, other potential vadose zone transport mechanisms and pathways for contaminants to reach groundwater. Clastic dikes are now included in the discussion of potential preferential pathways to groundwater.	
8.	2-28//4-7, Figure 2-11	The assertion in these statements is not supported with any actual data that has been provided. I don't see any valid basis for the statement, "Concentrations of VOCs detected in groundwater decrease away from the vadose zone source(s) and are correlative with decreasing concentrations in soil gas with distance from the source." (underline added for emphasis). The conceptual drawing on Figure 2-11 also his this inadequacy. No correlation whatsoever can be made between groundwater and vadose zone soil gas concentrations without soil gas data. Provide supporting data for these statements or remove them and Figure 2-11.		Accept	The text has been updated and additional data is provided showing the relationship between the distributions of measured soil gas concentrations to groundwater concentrations. Additional figures are provided to show how the distribution of PCE in groundwater has changed over time in response to implicit changes in the soil vapor plume.	
9.	4-1/4.2/19-27	Interim status requirements at 40 CFR 265.93(b) states the statistical comparisons are, " ... with its initial background arithmetic mean." Interim status requirements do not provide for updating the background mean, that final status requirements allow. Either NRDWL should be operating under a final status plan to implement this approach (updating the background mean), or it should be in an alternate monitoring program described in 40 CFR 265.90 (d).		Not Accepted	See response to Comment 2.	
10.		~~Elis Eberlein~~			Deleted per Ecology instruction at January 19, 2016 meeting.	
11.	p. 1-1, line 14	NRDWL is not a "non-operating interim status treatment, storage, and disposal (TSD) unit regulated as a land disposal unit". Hanford has a FINAL status permit although not all units have final status conditions at this		Not Accepted	Please see Section I.A of the Hanford Permit (Revision 8c), which states, "TSD units operating or closing under interim status will maintain interim	

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		point. The correct wording should be something like this. "The NRDWL is a final status closure unit operating under interim status requirements".			status until that TSD unit is incorporated into Part III, V, and/or VI of this Permit, or until interim status is terminated under WAC 173-303-805(8). Interim status units will be incorporated into this Permit through the Permit modification process." Additional text added to subject paragraph to clarify why the interim status designation is appropriate, "In accordance with Section I.A of the WA7890008967, *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit*, *Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste* (hereinafter referred to as the Hanford Facility RCRA Permit), NRDWL will continue to be considered an interim status unit until is it incorporated into Part III, V, and/or VI of the Hanford Facility RCRA Permit, or until interim status is terminated. Therefore, groundwater monitoring for NRDWL continues under interim status requirements."	
12	p. 2-5 line 13	Text says "non-hazardous constituents from the adjacent SWL". I assume this refers to the halogenated constituents such as PCE, TCE, TCA, DCA, carbon tetrachloride and acetone mentioned on page 2-20. The text is correct that they originated from the SWL, but all these constituents are toxic chemicals and referring to them as "nonhazardous" is not correct. I suggest removing the the word "non-hazardous" from this sentence and defer the discussion to later in the chapter.		Accept with Modification	Please see Section 2.6.5, Carbon Dioxide and Specific Conductance for additional discussion of the specific conductance exceedance. The non-hazardous constituents contributing to the high specific conductance measurements in 2001 are primarily calcium, bicarbonate, magnesium, and sulfate, which are all nonhazardous constituents. In 2001, 01-GWVZ-025 concluded that there are no identified hazardous waste constituents associated with the elevated	

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					levels of specific conductance noted at NRDWL. Text on line 13 revised to specify exceedances are of specific conductance and to identify calcium, bicarbonate, magnesium, and sulfate as the non-hazardous constituents.	
13.	p. 2-20, line 27	1, 1-Dichloroethane is incorrectly spelled.		Accept	Spelling is corrected.	
14.	p. 2-31, Table 2-2 title	See comment # 1		Not Accepted	Assume this refers to Comment 11 of the RCR. Please see response to Comment 11. No change to the title of Table 2-2, Pertinent RCRA Interim Status Facility Groundwater Monitoring Requirements. Additional language similar to that in Comment 11 disposition will be added as a table note.	
15.	p. 3-1, lines 7-9	"this RCRA interim status GW monitoring plan will be replaced according to a schedule ... " This is incorrect. The GW monitoring plan will be submitted with the complet permit application for NRDWL. NRDWL is a landfill and will not be "clean closed" so the permit application have to assume landfill closure and fulfill all the requirements associated with that.		Accept	Per comment 4 disposition, the paragraph that addresses closure and future groundwater monitoring requirements will be deleted: "~~It should be noted that NRDWL will be closed through an approved RCRA closure plan; after which, if clean closure performance standards are not achieved, this RCRA interim status groundwater monitoring plan will be replaced according to a schedule identified in the Hanford Facility Dangerous Waste Permit (WA7890008967) conditions for NRDWL, as appropriate. At that time, groundwater monitoring requirements (pursuant to WAC 173-303-645,~~	

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					~~"Releases from Regulated Units"), if applicable to NRDWL, will be determined."~~ ~~Text revised to remove discussion of the Permit schedule and clean closure.~~	

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Appendix C

Handout: Review Comment Record (RCR) for DOE/RL-2015-28, Draft A; 2015 Groundwater Monitoring Plan for the 183-H Solar Evaporation Basins

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REVIEW COMMENT RECORD (RCR)

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5. Document Number(s)/Title(s)	Project Name:	Reviewer Names:	8. Organization/Group	9. Location/Phone
DOE/RL-2015-28 Draft A, 2015 Groundwater Monitoring Plan for the 183-H Solar Evaporation Basins	NWP	Washington Department of Ecology	NWP/Cleanup	372-7926

	10. Agreement With Indicated Comment Disposition(s)	11. CLOSED
Date / Organization Manager (optional) (print and sign)	Date / Reviewer/Point of Contact (print and sign) / Author/Originator (print and sign)	Date / Reviewer/Point of Contact (print and sign) / Author/Originator (print and sign)

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1.	Title	Remove the "2015". This implies that it is only for that calendar year and is not permanent. It should read, "Final Status Groundwater Monitoring Plan for the 183~H Solar Evaporation Basins".	(Any recommended changes were included in the comment)	Accept	Title changed to "Final Status Groundwater Monitoring Plan for the 183-H Solar Evaporation Basins"	
2.	p. iii, Exec. Summary, line 24 and elsewhere in the document	Remove "RCRA" to read "modified closure". RCRA and the dangerous waste regulations do not apply to "modified closure". This is a Permit condition only in Rev. 8C of the Hanford Permit.		Accept	Text revised per comment.	
3	p. iv, Exec. Summary, line 15	Cite the Wayne Soper letter of 1997 as the reason it was deferred to the CERCLA program.		Accept	Reference added.	
4	p. iv, Exec. Summary, line 22	Change 40 CFR 261 to WAC 173-303. All citations will be to the dangerous waste regulations not the federal regulations because this is a final status unit.		Accept with Modification	References to 40 CFR 261 are removed from the document. Other 40 CFR references are included in historical discussion only. For this comment, ~~Text~~subject text referring to nitrate, fluoride, uranium, and Tc-99 as "not a dangerous waste" removed globally to address comment 6 and others. This change removes the subject text.	
5	General	All citations to the federal regulations (40 CFR) should be to WAC 173-303 instead. Make this change throughout the document.		Accept with Modification	See comment 4. References to 40 CFR 261 are ~~retained in~~removed from the document~~ for historical discussion only~~. Other 40 CFR references are included in historical discussion only.	

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6	p. iv, Exec. Summary, line 22	Nitrate and fluoride are by-products of dangerous waste constituents that were part of the waste in 183-H SEB. Therefore, they are dangerous waste constituents according to WAC 173-303-070. Rewrite the text to state Fluoride is no longer being monitoried under the RCRA groundwater monitoring program because it is below background and has been below its background groundwater concentration since XXXX. Nitrate is no longer being monitored under the RCRA groundwater monitoring program because it is being monitored through the CERCLA remedial action.		Accept with Modification	As agreed at the January 19, 2016 meeting with Ecology, nitrate is included as a dangerous waste in this monitoring plan. Text rewritten as shown: "~~Nitrate is no longer monitored under this plan because it is being monitored through the CERCLA remedial action.~~ Fluoride is no longer monitored because it is below background and has been below its background groundwater concentration in the monitoring ~~RCRA~~ well~~s~~ network throughout the corrective action monitoring period. Monitoring of uranium and technetium-99 is conducted under the CERCLA remedial action."	
7	p. v, Exec. Summary, line 22	Replace the term "detection monitoring" with "corrective action monitoring".		Accept	Term replaced on p. v, Exec. Summary, line 6.	
8	p. v, Exec. Summary, line 19	Delete this line. It is an option only.		Accept	Change made per comment.	
9	p. v, Exec. Summary, line 29	Delete this sentence, "Active extraction wells east and northeast of the site enhance the flow in that direction." Active extraction wells exist all around the waste site and flow has been known to reverse during the summer months related to river stage influences.		Accept	Change made per comment.	
10	p. 1-1, Sec. 1, line 6	The Hanford Permit is tittled, "Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion". Please change the title accordingly.		Accept with Modification	Permit callout and text changed to "WA7890008967, *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste* (hereinafter referred to as the Hanford Facility RCRA Permit)." Other text referring to Permit in the text is changed accordingly.	

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11	p. 1-1, Sec. 1, line 8	Change "provisions" to "conditions" and add the words, "in the Permit" to read," ...and the unit was closed in 1997 under modified closure conditions in the Permit with specified remedial measures under post-closure care... "		Accept with Modification	Slight modification per comment 10 resolution. "…the unit was closed in 1997 under modified closure conditions in the Hanford Facility RCRA Permit with specified remedial measures under post-closure care…"	
12	p. 1-1, Sec. 1, line 14	Insert "Dangerous Waste Portion" after Permit and the cited reference to the Permit.		Accept with Modification	Removed "(WA 7890008967) as it is included in the first callout to the permit. Text retained as "Hanford Facility RCRA Permit," as described in comment 10 disposition.	
13	p. 1-1, Sec. 1, line 27-43	Provide citatations to all sentences that describe these closure actions. As is, no supporting documentation exists to definitively state that the test pit was dug from the bottom of the engineered structure. This is an assumption. It is not supported by the closure plan or post-closure plan.		Accept	Citation to DOE/RL-97-48 added for each sentence. Per the postclosure plan (DOE/RL-97-48), a test pit was dug in the Basin 1 excavation "to 7.6 m (25 ft)" (Section 1.2.4) Unfortunately, DOE/RL-97-48 does not specify whether the 25 ft depth is measured below ground surface or below the excavated depth of Basin 1. Information in DOE/RL-97-48 combined with sample depth information in BHI-00932 (Section 4.1) infer the test pit depth reached 40 ft bgs. Paragraph modified to include information in DOE/RL-97-48 only. Specific text discussing the test pit depth changed to, "~~Nitrate and fluoride soil contamination in the vadose zone at a depth greater than 4.6 m (15 ft) below the basin floor was identified at Basin 1, resulting in a total excavation depth of approximately 9 m (30 ft) below grade.~~ Deeper contamination was indicated below Basin 1 and soil removal continued to 4.6 m (15 ft) below the former structure (DOE/RL-97-48, Section 1.2.4). A test pit below Basin 1	

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					was dug to 7.6 m (25 ft) (DOE/RL-97-48, Section 1.2.4). DOE/RL-97-48 does not specify whether the Basin 1 test pit depth is measured from ground surface or from the excavation depth, however, the test pit results represent soil at least 7.6 m (25 ft) bgs. ~~below the former structure for a total depth of about 12 m (40 ft) below grade, which was the depth of groundwater at the time of excavation.~~"	
14	p. 1-1, Sec. 1, line 40	Rewrite this sentence. No where is "closed-out" written. Rewrite the sentence to state, "Because of the presence of contamination extending from 15 to 25 ft below the Basin 1 structure, waste site 116-H-6 underwent a modified closure in accordance with the Hanford Permit in 1997, which included groundwater monitoring."		Accept with Modification	Slight modification to sentence: "Because of the presence of contamination extending from 4.6 to 7.6 m (15 to 25 ft) below the Basin 1 structure, waste site 116-H-6 underwent a modified closure in accordance with the Hanford Facility RCRA Permit in 1997, which included groundwater monitoring." Preceding sentence also deleted to avoid duplication of text.	
15	p. 1-1, Sec. 1, line 45 and p. 1-2, line 1	Provide what is meant by the parenthetical "(those facilities still engaged in the permiting process)". It is not clear what this represents.		Accept with Modification	Subject phrase is not needed for this sentence and is deleted.	
16	p. 1-2, Sec. 1, line 28	Insert a new sentence that reads, "The other constituents of nitrate and uranium will be monitored under the 100-HR-3 OU pump and treat system while fluoride and technetium-99 will no longer be monitored."		Accept with Modification	As agreed at the January 19, 2016 meeting with Ecology, nitrate is included as a dangerous waste in this monitoring plan. Text modified as shown: "The other constituents of ~~nitrate,~~ uranium and technetium-99 are monitored under the 100-HR-3 OU pump and treat system while fluoride will no longer be monitored."	
17	Figure 1-2	Use figure 1-2 of the Post-Closure Plan (DOE/RL-97-48). State that this is a Schematic Plan View in the caption.		Accept	Figure will be replaced per comment. Caption changed to note both plan and section views are presented.	

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18	p. 2-1, Sec. 2, lines 13-14	Provide that this proposed plan document is DRAFT.		Accept	"Draft A" added to callout.	
19	p. 2-1, Sec. 2.1 line 22	Provide what "facility", because according to the Permit the Hanford Site is the "facility". Please state "basins" instead of "facility"		Accept	Sentence deleted and replaced in response to Comment 20. The word "facility" is removed.	
20	p. 2-1, Sec. 2.1 line 22	Concrete from basins 5 through 16 still remain. Please clarify how or if the basins were demolished or simply backfilled with clean soil.		Accept	Sentences describing the demolition of the 183-H water treatment plant from the 1995 BHI-00127 (100-H Area Technical Baseline Report) is added. "Demolition of the 183-H water treatment plant was initiated in the spring of 1974. The 183-H head house, 12 of the flocculation and sedimentation basins, filter building, and the clearwell pump room were demolished and the underground portions were backfilled to grade (BHI-00127, Section 4.6)."	
21	p. 2-1, Sec. 2.1 line 28	Provide a citation to last sentence in this parapgraph that supports the waste stream going to 183-H SEBs.		Accept	Reference to DOE/RL-88-04 Rev. 3, Section 1.A-3 added.	
22	p. 2-2, Sec. 2.1 line 7-9	Provide supporting evidence to "In Basin 1, a test pit was excavated to a depth of 7.6 m (25 ft) below the structure for a total depth of about 12 m (40 ft) below grade (the depth of groundwater at the time of excavation). No documentation supports this statement.		Accept	See response to comment 13. Sentence modified to, "In Basin 1, a test pit was excavated to a depth of at least 7.6 m (25 ft) bgs (DOE/RL-97-48, Section 1.2.4) ~~below the structure for a total depth of about 12 m (40 ft) below grade (the depth of groundwater at the time of excavation)~~."	
23	p. 2-2, Sec. 2.1 line 13	Add "appropriately" between "and" and "disposed" to read, "transported from the site and appropriately disposed."		Accept	Change made per comment.	
24	p. 2-2, Sec. 2.2 line 20-21	Provide the compliance groundwater monitoring plan that was initated in 1986 at this location.		Accept	Reference for PNL-6470 added.	
25	p. 2-2, Sec. 2.2, Line 23 and 27	Conflict exists between the two dates. EPA gives authority in Nov. 1987, yet Washington State was authorized in August 1987. This means Washington State had authorization before EPA authorized it. Please provide clarification to this paragraph of the chronlology of events. EPA delegated RCRA-based program to Ecology on January 31, 1986, not		Accept	Though appearing to conflict, the two dates provided were the result of legal rulings made at the time. To avoid confusion in the GWMPs, text has been changed: "~~In November 1987, the U.S. Environmental Protection Agency~~	

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		November 1987 or delete this discussion since it is in the Permit and provides no real value.			~~(EPA) authorized Ecology to regulate these hazardous waste components within the State of Washington (51 FR 24504, "EPA Clarification of Regulatory Authority Over Radioactive Mixed Waste"). In 1996, the Washington State Attorney General determined that the effective date for regulation of mixed waste in Washington State was August 19, 1987.~~The hazardous waste components of mixed waste were determined to be subject to Ecology authority to regulate these waste since August 19, 1987."	
26	p. 2-2, Sec. 2.2, Lines 32-34	Rewrite the first sentence to read, "Dangerous waste is regulated under the Hazardous Waste Management Act (RCW 70.105) and its implementing regulations (WAC 173-303) which implements RCRA for Washington State." Delete 40 CFR 265. This standard is an interim status requirement and a federal standard when final status requirments are required.		Accept with Modification	Slight modification to sentence: "Dangerous waste is regulated under RCW 70.105, "Hazardous Waste Management" and its Washington State implementing regulations (WAC 173-303)."	
27	p. 2-2, Sec. 2.2, Line 39	Change to read, "Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion For the Treatment, Storage, and Disposal of Dangerous Waste". This is the title of the Hanford Facility RCRA Permit.		Accept with Modification	Removed "(WA 7890008967) as it is included in the first callout to the permit. Text changed to "In 1994, Ecology issued the Hanford Facility RCRA Permit," in accordance with comment 10.	
28	p. 2-4, Sec. 2-2, Lines 1-5	Change this parapgraph to cite what DOE/RL-88-04 actually states. The groundwater monitoring program will continue throughout the closure/post-closure period. The section is titled, "Monitoring Plan Proposed to be Conducted Until Issuance of Final Status Post-Closure Permit. This document is a 1990 document and does not contradict the permit. Closure occurred in 1997 and a final status groundwater monitoring plan was issued in 1995.		Accept with Modification	This discussion of the interim status plan and the RCRA Permit was provided in the previous monitoring plan (PNNL-11573, Section 2.2), however, it is not necessary and is deleted.	
29	p. 2-4, Sec. 2-2, Line 3	Delete sentence, "This was an apparent contradiction in the permit."		Accept	Change made per comment.	

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30	p. 2-4, Sec. 2-2, Line 5	Add at the end of the sentence, "and in the requirements established in Chapter 3.0 of Part VI, Post-Closure Unit 2.		Accept	Change made per comment. Sentence moved to preceding paragraph as part of addressing comment 31.	
31	p. 2-4, Sec. 2.2, Lines 9-11	Remediation was not deferred to the CERCLA program until May 1997. Please provide a correct discussion of the chronological events. As written, this has not been done.		Accept	Text in multiple paragraphs moved to align with chronological events and revisions per comments 28-35.	
32	p. 2-4, Sec. 2.2, Lines 11-12	Delete the last sentence, "The RCRA monitoring continued under the compliance program (WHC-SD-EN-AP-180)." This is incorrect. According to Letter titled "Excceedance of Concentration Limits in Groundwater at 183-H Solar Evaporation Basins" notification was given in this letter dated September 1996. Exceedances occurred in the Fall 1995 and on the spring 1996 sampling event (confirmation resampling). After this point, a new monitoring plan was created.		Accept	Sentence deleted. Text in following paragraphs adjusted to better align chronologically per comment 31.	
33	p. 2-4, Sec. 2.2, Lines 13	Corrective action is a RCRA term. Change to read "Remedial actions under CERCLA to address chromium groundwater contamination in the 100-H Area was initiated as part of a CERCLA remediation activities through a pump and treat system."		Accept	Change made per comment.	
34	p. 2-4, Sec. 2.2, Lines 23	Delete the word "RCRA" between "modified" and "closure (soil)"to read "a modified closure (soil) was approved by... "		Accept	Change made per comment.	
35	p. 2-4, Sec. 2.2, Lines26	Delete the words, "even though these are not dangerous wastes". This is subjective and is not based on the regulations. Both nitrate and fluoride are breakdown chemicals from the waste disposed at 183-H.		Accept	Change made per comment.	
36	p. 2-4, Sec. 2.2, Lines 31	Change "closed-out" to "modified closed under the RCRA Permit (Soper, 1997).		Accept with Modification	Sentence changed with slight modification: "Waste site 116-H-6 pertains to the chemical contamination beneath the site which underwent a modified closure under the Hanford Facility RCRA Permit (Soper, 1997)."	
37	p. 2-4, Sec. 2.3, Line 44	Insert "of' between "indicate that some" and "the waste was corrosive" to read "indicate that some of the waste was corrosive"		Accept	Change made per comment.	
38	p. 2-5, Sec. 2.3, Line 4	Provide a citation at the end of "disposal". A citation is needed to provide where this information was taken.		Accept	Added reference: PNL-6728, Geohydrologic Characterization of the Area Surrounding the 183-H Solar Evaporation Basins, Section 2.4.	

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39	p. 2-4 and 2-5, Section 2.3	Provide how all these dangerous waste constituents were disposed after closure.		Accept	Disposition of the 300 Area waste after 1985 added as a new paragraph at end of section.	
40	p. 2-4 and 2-5, Section 2.3	Provide if these dangerous waste constituents were detected in the soil and groundwater.		Accept with Modification	Metals identified in the waste evaporated at the 183-H SEB are present naturally in Hanford soil and are detectable. New text added in Sections 2.5 and 2.6 to address soil and groundwater contaminants and detections. New text identifying the dangerous waste constituents of concern during remediation of arsenic, hexavalent chromium, copper, fluoride, nitrate, and nickel is added to Section 2.6 (DOE/RL-97-48, Table 1-1). Soil sampling results from eight, pre-remediation (1991) and one remedial investigation (2011) boreholes at 183-H is added in Section 2.6 (DOE/RL-2010-95, Section 4.3.17). Added new table with borehole results (see comment 60). Expanded discussion in Section 2.5 of groundwater analyses and results from earlier monitoring years (1986 – 1991) per comment 45.	
41	p. 2-13, Sec. 2.5, Line 6-8	Provide the "limited suite of analytes" that were sampled.		Accept with Modification	Text deleted as discussed in comment 43.	
42	p. 2-13, Sec. 2.5, Line 6	Provide the well numbers for the one well drilled in 1974 and three in 1983.		Accept with Modification	Text deleted as discussed in comment 43.	
43	p. 2-13, Sec. 2.5, Line 6-8	Provide the groundwater monitoring plan that was used in the early 1970s or delete this discussion entirely.		Accept with Modification	This information is reported in the previous monitoring plans WHC-SD-EN-AP-180, Section 1.1 (1995) and PNNL-11573, Section 1.1 (1997). Details of the previous plan were not provided. Deleted text: “Four wells were installed: one in 1974 and three in 1983. These wells were sampled for a limited suite of analytes as part of a routine monitoring program.”	

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44	p. 2-13, Sec. 2.5, Line 6-8	Basin 1 was recognized leaking in 1978. This does not correspond to the "early 1970s. Provide the reference that Basin 1 was leaking in the "early 1970s. Provide information in this document how they knew Basin 1 was leaking.		Accept with Modification	Information in PNL-6470 reports nitrate and CrVI levels in 199-H4-3 increased in 1977 (p. 19). A specific discussion of contamination in the early 1970's is not presented, however Figure 14 indicates increases in chromium during the early 1970's. Reference to the early 1970s removed and sentence changed to address only the increase observed in 1977 to better align with the discussion in PNL-6470. "Analytical sampling results in ~~from the early 1970s~~1977 indicated the presence of groundwater contamination associated with Basin 1 (PNL-6470, p. 19)."	
45	p. 2-16, Sec. 2.5, Lines 15-19	Provide the actual suite of analytes including which metals, anions, and selected organic constituents were analyzed.		Accept with Modification	Comment is identified for lines on p. 2-16 addressing the 1995 monitoring plan (WHC-SD-EN-AP-180) but appear to apply to the 1986 monitoring plan (PNL-6470) on p. 2-13 as there are no organics included in the 1995 plan. Analytes added to discussion of PNL-6470 analyses (PNL-6470, pp. 32-39). Sampling and analysis information also expanded in response to comment 40.	
46	p. 2-16, Sec. 2.5, Line 6	Delete "and during the post-closure period". On page III-53 of DOE/RL-88-04, the sampling program lasted until post-closure permit (beginning of post-closure care period).		Accept	Change made per comment.	
47	p. 2-16, Sec. 2.5, Line 23	Should be "PNNL-11573" not PNL-11573. Add a "N"		Accept	Change made per comment	
48	p. 2-16, Sec. 2.5, Line 25	Change "correction" to "corrective".		Accept	Change made per comment	
49	p. 2-16, Sec. 2.5, Line 25	Rewrite sentence to read, "The corrective action was implemented through the interim remedial action under CERCLA for the 100-HR-3 Groundwater OU." Change "deferred to" to "implemented-through".		Accept	Change made per comment.	

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50	p. 2-16, Sec. 2.5, Line 30	Insert the sentence, "None of these wells are upgradient wells because of changes in the flow system from pump and treat activities and river stage effects."		Accept with Modification	Slight modification to keep tense consistent: "None of these wells were upgradient wells because of changes in the flow system from pump and treat activities and river stage effects."	
51	p. 2-16, Sec. 2.5, Line 34	Add to the end of the sentence, "because of previous releases from Basin l" so the sentence will read, "Fluoride was also monitored as an indicator of 183-H contamination in groundwater because of previous releases from Basin l."		Accept	Change made per comment.	
52	p. 2-16, Sec. 2.5, Line 32	Provide which anions and selected metals are being analyzed.		Accept	Anions and metals added.	
53	p. 2-18, Figure 2-9	Provide if this includes July.		Accept	Added the months included for the plume maps (from the figure legends) for both Figures 2-8 and 2-9.	
54	p. 2-18, Figures 2-8 and 2-9	Provide why August is not included in the analysis of the plume maps. August is the highest hexavalent chromium sampling month at times and it is not included on either map (High River Stage and Low River Stage).		Accept	Added the following below Figure 2.9, "Note: High and low river stage are evaluated each year based on actual flows. For the year presented (2014) high river stage occurred from April through the end of July (DOE/RL-2015-07, *Hanford Site Groundwater Monitoring Report for 2014* [Figure 4-6])."	
55	p. 2-20, Sec. 2.5, line 9	Discussion in previous paragraphs details the progression of wells used in the monitoring network, this sentence infers that one of the four wells in the network has been dropped but no clear discussion of which of wells considered the "three existing monitoring wells ... " are. Please clarify here which well is dropped and why.		Accept	Discussion added. "Under this monitoring plan, the network is modified to replace Well 199-H4-12A with 199-H4-85, which is closer to the site, and remove 199-H4-12C. Well 199-H4-12C is an extraction well that is completed in the first water bearing unit of the RUM unit, a confined aquifer."	
56	p. 2-20, Sec. 2.6, lines 27-29	This sentence does not make sense. Please rewrite this sentence, "Source remediation removed the engineered structure and soil contaminants underneath the 183-H Solar Evaporation Basin as necessary to reduce or eliminate the potential for direct exposure migration through the vadose		Accept with Modification	Text edited for clarity. "Source remediation removed the engineered structure and soil contaminants underneath the 183 H Solar Evaporation Basin as necessary to	

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		zone to the groundwater, and wind-blown suspended particles." Removing the engineered structure removed the direct contact and wind-blown suspended particles. Removing the structure and the soil beneath Basin 1, reduced the amount of contaminants in the vadose zone leaching to groundwater reducing impacts to groundwater. As written, direct exposure migration through the vadose zone to the groundwater makes no sense. Direct exposure can not migrate through the vadose zone to groundwater.			reduce or eliminate the potential for: direct exposure, migration of contaminants through the vadose zone to the groundwater, and wind-blown suspended particles."	
57	p. 2-20, Sec. 2.6, lines 34-35	Provide a citation for contaminants left at closure. Based on DOE/RL-97-48, fluioride, and nitrate were detected in the soil at 15 ft below the basin structure. No other contaminant was reported that exceeded Method C standards. Hexavalent chromium was not identified in deep soils.		Accept	Text revised. "However, at the time of closure, the extent of remaining contamination extended from a depth of 4.6 m (15 ft) below the bottom of the basin structure to groundwater, and appeared to include ~~chromium,~~ fluoride and nitrate~~, and uranium~~ (DOE/RL-97-48, Section 1.2.4)."	
58	p. 2-20, Sec. 2.6, lines 36	Provide which "test pit sample results" is being cited.		Accept	Text changed to specify "Basin 1 test pit sample results."	
59	p. 2-20, Sec. 2.6, lines 36-45	Provide how deep these boreholes and test pit went in reference to the soil data presented.		Accept	Information for the test pit depth added to preceding paragraph: "A test pit below Basin 1 was dug to 7.6 m (25 ft) (DOE/RL-97-48, Section 1.2.4). DOE/RL-97-48 does not specify whether the Basin 1 test pit depth is measured from ground surface or from the excavation depth, however, the test pit results represent soil at least 7.6 m (25 ft) bgs. Both nitrate and fluoride contamination were identified at this depth (DOE/RL-97-48, Section 1.2.4)." Borehole depths added: "In 1991, eight boreholes were drilled in and around the basins. Of the four boreholes within the basins (A5716/17/18/19), the depths ranged from 9.6 m (31.5 ft) to 10.2 m	

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					(33.4 ft) bgs. Of the four boreholes outside of the basins (A5720/21/22/23), the depths ranged from 11.3 m (37.0 ft) to 17.3 m (56.9 ft) bgs. In 2011, a borehole within the Basin 1 footprint was drilled to 14.8 m (48.6 ft) bgs." New Table 2-2 added to address comment 60 and includes depths of contaminant detections in boreholes as reported in RI/FS Tables D-91, D-92, and D-93 (DOE/RL-2010-95).	
60	p. 2-20, Sec. 2.6, lines 36-45	Provide the maximum extent of contamination, for all contamianants for completeness (tritium even if it does not exceede any standard.		Accept	New Table 2-2 is added and includes depths of contaminant detections in borehole as reported in RI/FS Tables D-91, D-92, and D-93 (DOE/RL-2010-95).	
61	p. 2-21, Sec. 2.6, lines 1-3	Provide for the time span from 2009 to present whether hexavalent chrpomium and nitrate were detected at 183-H.		Accept	Revised nitrate discussion based on agreement to include it as dangerous waste in this plan. Nitrate plots for the 183-H wells are added to Appendix D so references to previous semiannual reports (SGW-52136 and SGW-54971) are no longer needed. CrVI results are reported with the chromium (total, filtered) in Appendix D. CrVI and nitrate results from 183-H RCRA wells are ~~reported~~ presented in ~~183-H semiannual RCRA reports.~~ Appendix D. Text added to describe MCL exceedances. "From amongst the ~~RCRA~~ monitoring well network since 2010, ~~CrVI~~ hexavalent chromium continues to be detected above the MCL (48 µg/L) in Well 199-H4-12C (Appendix D). Nitrate above the MCL (45 mg/L) has been detected at Wells 199-H4-3 (2011, 2012), 199-H4-12A (2012), and 199-H4-84 (2012)	

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					(Appendix D).~~SGW-52136, SGW-54971).~~"	
62	p. 2-21, Sec. 2.6, lines 11-16	Provide if these mechanisms are still ongoing or not..		Accept	Added text: "(this process may be ongoing if contaminants are present in the vadose zone)."	
63	p. 2-23, Sec. 2.7, Table 2.2, Compliance Period	Provide the compliance period for the 183-H SEB unit. It would be from 1973 to 1997 (closure)		Accept with Modification ~~Not accepted~~	Table 2-3 identifies the pertinent requirements under WAC 173-303-645 and identifies what document section(s) address the requirement. The compliance period discussion is primarily in Section 3.4. As discussed at the Ecology meeting on January 19, 2016, the compliance period will be 25 years. Details of the compliance period will be provided in Section 3.4. Table 2.2 will remain as written with the regulatory text but no site-specific details. Revised Section 3.4 text: The compliance period under WAC 173-303-645(7)(a) is the number of years equal to the active life of the waste management area (including any waste management activity prior to permitting, and the closure period). The 183-H Solar Evaporation Basins began operation in 1973 and were closed in 1997, which is a total of 25 years. Therefore, the compliance period for the 183-H Solar Evaporation Basins is equal to 25 years and will end in year 2022. Under WAC 173-303-645(7)(c), if a corrective action program is ongoing at the end of the compliance period (year 2022), then the corrective action must continue for as long as necessary to	

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					achieve compliance with the concentration limit. The compliance period is extended until it is demonstrated that the concentration limit has not been exceeded for a period of three consecutive years. Monitoring for both of the dangerous wastes will continue through the compliance period. However, it possible that the concentrations of one or both dangerous waste could fall below the concentration limit during the compliance period. If the concentrations are less than the concentration limit for the three year period before the end of the compliance period (years 2019 through 2022), then monitoring will be discontinued at the end of the compliance period. If concentrations of either or both dangerous wastes are not less than the concentration limit in year 2022, then monitoring for the dangerous waste(s) above the concentration limit will continue until it is demonstrated that the concentration limit has not been exceeded for a period of three consecutive years. Evaluation methodology for the sampling results is detailed in Section 4.2. Dangerous waste concentrations will be determined with either a 95 percent upper confidence limit (UCL) calculation (for data sets containing detections above the concentration limit) or by visual observation (for data sets containing non-detects and/or detections below the concentration limit). When	

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					both dangerous wastes have been below the concentration limit for 3 consecutive years, corrective action monitoring will be discontinued, and the site will be removed from the Hanford Facility RCRA Permit. ~~As discussed in Section 3.4, and agreed to at the ECY/DOE/PRC meeting held 08/19/15, the compliance period for 183-H will end when the sample results for total chromium (filtered) in point of compliance wells (Section 3.3) have been below 48 µg/L for three years.~~	
64	p. 3-1, Sec. 3.1, Line 14	Text states "(typically April through August)" the map (Figure 2-9) is from April to July. It is not clear if the data for July and August are included on the map. The text does not match that on the map. Please make consistent.		Accept	High and low river stage are evaluated each year based on actual flows. For the year presented (2014) high river stage was from April through July (end). Added "(note: for 2014, high river stage extended from the first part of April through the end of July)" to clarify.	
65	p. 3-1, Sec. 3.1, Line 19-29	Sampling events for all wells in this DW monitoring program will occur over a one week period. The data is meaningless for statistical analysis if taken over a month or quarter period.		Accept with Modification	This response was revised based on a separate comment resolution meeting with Ecology held March 16, 2016. Neither WAC 173-303-645 or Unified Guidance (EPA 530/R-09-007) specify a required window for sample collection within monitoring well networks. As described in subject text, wells are scheduled for sampling by month and delayed sampling events are rescheduled as soon as possible. Sampling delays result from multiple factors including environmental (i.e., inclement weather) and access restrictions (i.e., heightened fire danger, area access restriction due to work by other Hanford contractors such as in the tank farms). In the event that a sampling delay has occurred and the	

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					representativeness of the samples is in question, DOE and ECY may agree to resampling wells. As discussed with ECY on March 16, 2016, CHPRC will change the pre-well sampling walkdown process. If it is observed that one or more network wells cannot be sampled during the walkdown, then sampling of the well network will not begin and management will be notified. Depending on the situation, the network sampling will be rescheduled within a short time frame (such as 3 to 4 weeks). In some cases, it may not be obvious that sampling cannot be performed until a well is accessed (e.g., an issue with a pump). DOE will provide informal notification to Ecology if sampling of the network is expected to be delayed for longer than 4 weeks. Ecology may provide input in a timely fashion to DOE on how to proceed. ~~Absent precluding site conditions, sampling will be performed within 2-3 weeks.~~	
66	p. 3-1, Sec. 3.1, Line 39	Change background to below 48 ug/L. Background in the surrounding unconfined aquifer are below 48 ug/L, the MTCA cleanup level and level of cleanup required under MTCA and the proposed plan for 100-HR-3 OU. Therefore, this should be the same value for background concentrations.		Accept with Modification ~~Not accepted~~	Note that Line 39 is in Section 3.2. As agreed at the January 19, 2016 meeting with Ecology, the concentration limit for total chromium (filtered) will be 48 µg/L. Discussion of a background value in Section 3.2 is removed. ~~As agreed to at the ECY/DOE/PRC meeting held 08/19/15, the background value for total chromium (collected as a filtered sample) is 100 µg/L.~~	
67	p. 3-2, Sec. 3.4, Lines 21-22	The 183-SEB is closed. Remove the phrase, "and the site will be closed and."		Accept with Modification	Modification to retain text that the site will be removed from the permit.	

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					"When the compliance period has ended, then corrective action monitoring will be discontinued, and the site will be ~~closed and~~ removed from the Hanford Facility RCRA Permit."	
68	p. 3-2, Sec. 3.4, Lines 35-36	Provide the proof that "Chromium concnetrations from Well 199-H4-12C are from historical releases at other sources and not attributable to the 183- SEBs."		Accept	Information on the CrVI concentrations at 199-H4-12C after its conversion to an extraction well is presented in SGW-52135, *First Semiannual Report for 2011 Post-Closure Corrective Action Groundwater Monitoring at the 183-H Solar Evaporation Basins and 300 Area Process Trenches: January - June 2011*. Expanded discussion of well network changes in Section 2.5 with information from SGW-52135 to address comment. Reference to Section 2.5 added to the subject sentence. Text added to Section 2.5: As reported in SGW-52135, *First Semiannual Report for 2011 Post-Closure Corrective Action Groundwater Monitoring at the 183-H Solar Evaporation Basins and 300 Area Process Trenches: January-June 2011* (Section 2.3), chromium concentrations from Well 199-H4-12C reflect contamination from past releases that entered the RUM. Hexavalent chromium levels in Well 199-H4-12C declined from approximately 300 µg/L in the early 1990s, and were stable until 2009, when the well was connected to the 100-HR-3 pump and treat system (see Appendix D, Figure D-5). After the connection, hexavalent chromium concentrations climbed, as contaminated groundwater was pulled towards the extraction well. This conclusion is also supported by	

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					observation that basin co-contaminants (i.e., nitrate, technetium-99, and uranium) are not elevated in Well 199-H4-12C (SGW-52135, Section 2.3), and that the 100-H aquifer test and rebound study suggests that there is low communication between the unconfined aquifer and the confined aquifer at this location (SGW-47776, *Aquifer Testing and Rebound Study in Support of the 100-H Deep Chromium Investigation*, Section 4.1).	
69	p. 3-2, Sec. 3.4, Lines 38-39	Delete the phrase, "and better represents the groundwater conditions at the 183-H Solar Evaporation Basins." This phrase is an option and can not be supported.		Accept	Phrase deleted.	
70	p. 3-5, Sec. 3.5, Line 5	Provide whom will "accept" these two wells (199-H4-88 and 199-H4-89).		Accept with Modification	Modified sentence to clarify, changed "accepted" to "completed."	
71	p. 3-5, Table 3-3, Justification Summary	Delete the phrase, "are not dangerous wastes and" This phrase is incorrect, because nitrate is a residual contaminant from the waste disposed at 183-H SEB and is therefore monitored as indicated in the Post-Closure Plan in the Permit (DOE/RL 97-48).		Accept with Modification	As agreed at the January 19, 2016 meeting with Ecology, nitrate is included in this plan. Revised existing text to include nitrate as a dangerous waste and align with revised ES text (comment 6): "~~Nitrate is no longer monitored under this plan because it is being monitored through the CERCLA remedial action.~~Fluoride is no longer monitored because it has been below its background groundwater concentration in the ~~RCRA~~ monitoring wells throughout the corrective action monitoring period. Monitoring of uranium and technetium-99 is conducted under the CERCLA remedial action."	

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72	p. 3-5, Table 3-3, Justification Summary	Provide what the anions and metals that will be collected under CERCLA		Accept	Added analytes in new footnotes to the table.	
73	p. 3-5, Table 3-3,	Nitrate still needs to be monitored as a dangerous waste under this plan with the 45 mg/L standard.		Accept ~~Not accepted~~	As agreed at the January 19, 2016 meeting with Ecology, nitrate is included in this plan. Nitrate as a dangerous waste at a concentration limit of 45 mg/L added to Table 3.3. ~~As agreed at the ECY/DOE/PRC meeting held 08/19/15, nitrate is dropped from the revised RCRA monitoring plan~~	
74	p. 3-6, Table 3-3, Concentration Limit, Current Plan and Justification Summary	Provide the background value as of 2014 which would be 20 mg/L, not 100 ug/L based on the two chromium maps (Figures 2-8 and 2-9). Text states the background value is 48 ug/L. Based on WAC 173-303-645(8)(a)(i) of		Accept with Modification ~~Not accepted~~	The last sentence of the comment is incomplete. As agreed at the January 19, 2016 meeting with Ecology, the concentration limit for total chromium (filtered) is 48 µg/L based on the WAC 173-340-720 Method B Cleanup Levels for hexavalent chromium in groundwater. Discussion of chromium background value is removed. ~~As agreed at the ECY/DOE/PRC meeting held 08/19/15, the background value for total chromium (collected as a filtered sample) is 100 µg/L.~~	
75	p. 3-6, Table 3-3, Well Network and Justification Summary	Delete the phrase "and better represents the groundwater conditions."		Accept	Phrase deleted.	
76	p. 3-7, Sec. 3.6, Line 7	Delete "dangerous waste and, therefore, includes monitoring only for ... "		Accept	Phrase deleted. Added sentences: "~~Nitrate, u~~Uranium and technetium-99 are monitored as part of the CERCLA IRM. Fluoride will no longer be monitored."	

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77	p. 3-7, Sec. 3.6, Line 10-11	Nitrate should stay in this monitoring plan. Rewrite this sentence to read, "Uranium, technetium-99 and fluoride are no longer monitored under this monitoring plan."		Accept with Modification ~~Not accepted~~	As agreed at the January 19, 2016 meeting with Ecology, nitrate is added to the monitoring plan. Text changed to: "Uranium and technetium-99 are monitored as part of the CERCLA IRM. Fluoride will no longer be monitored." ~~As agreed at the ECY/DOE/PRC meeting held 08/19/15, nitrate is dropped from the revised RCRA monitoring plan.~~	
78	p. 3-7, Sec. 3.6, Lines 13	Add "including nitrate, uranium, and technetium-99.		Accept with Modification	This change is not needed because preceding text in paragraph was changed to incorporate comment 6. First 2 sentences revised to: "This revised plan monitors only total chromium (collected as a filtered sample) and nitrate. Uranium and technetium-99 are monitored as part of the CERCLA IRM." ~~The first 2 sentences now state: "This revised plan monitors only total chromium (collected as a filtered sample). Nitrate, uranium, and technetium-99 are monitored as part of the CERCLA IRM."~~	
79	p. 3-8, Sec. 3.6, Line 24	Based on the information presented, the concentration limit for chromium (filtered) is 48 ug/L, not 100 ug/L. Change the document accordingly.		Accept ~~Not accepted~~	As agreed at the January 19, 2016 meeting with Ecology, the concentration limit for total chromium (filtered) is 48 µg/L ~~As agreed at the ECY/DOE/PRC meeting held 08/19/15, the concentration limit is the same as the background value for total chromium (collected as a filtered sample) at 100 µg/L.~~	
80	p. 4-1, Sec. 4.2, Line 8	Change this sentence to read, "...evaluation during the corrective action is to monitor the trend of the concentration of filtered total chromium to confirm that the corrective action is progressing as expected."		Accept with Modification	Slight modification to align with the identification of the dangerous waste as: "total chromium collected as a filtered sample and nitrate".	

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					"…evaluation during the corrective action is to monitor the concentration trends of the ~~concentration of~~ dangerous wastes (total chromium, collected as a filtered sample, and nitrate) to confirm that the corrective action ~~(CERCLA remedial action)~~ is progressing as expected."	
81	p. 5-1, Sec. 5	DOE/RL-88-04 should be Rev. 3 not Rev. 1 dated 1991.		Accept with Modification	Rev. 1 reference retained as it included the 1988 monitoring plan revision that is discussed in Section 2.5. Corrected hyperlink for the Rev 1 callout. Added references to Revs. 2 and 3 for other informational uses of the document. Updated callouts for DOE/RL-88-04 document throughout the plan to specify the revision.	
82	p. 5-3, Sec. 5	WA 7890008967 reference: This is not the title of the document. The title of the document is "Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, For the Treatment, Storage, and Disposal of Dangerous Waste, Revision 8C. Please change.		Accept	Title of the Permit revised per comment 10. Reference will be changed to: ~~Reference for WA 7890008967 deleted and replaced with;~~ WA7890008967, *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit, Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste*, Revision 8c, as amended, Washington State Department of Ecology, Richland, Washington.. Available at: http://www.ecy.wa.gov/programs/nwp/permitting/hdwp/rev/8c/.	
83	p. A-6, Sec. A2.3, Line 16	WAC 173-303-645(5) is the Concentration Limit requirements not the Dangerous Constituents requirements. Change to WAC 173-303-645(4) instead.		Accept with Modification	The subject sentence in the Project/Task Description was rewritten to read: "The focus of this plan is to monitor for dangerous waste in accordance with WAC 173-303-645(11), evaluate the	

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					well network, and interpret analytical results."	
84	p. A-16, Sec. A3.3.l, Lines 1-4	This sampling protocol resembles a duplicate more than a split sample. Typically, a large sample is homogenized before being spilt into smaller samples for separate lab analysis.		No Change Needed	This GWMP applies to groundwater samples only. Field duplicates and splits have historically been collected as described above. Historically, results have shown that post-purge consecutive sampling provides adequate sample homogeneity to indicate laboratory comparability	
85	p. A-19, Sec. A4	Provide when and where DOE and Ecology get notified of assessment findings.		No Change Needed	This response was revised based on a separate comment resolution meeting with Ecology held March 16, 2016. These assessments are internal assessments and are not subject to RCRA regulation. If an assessment finding results in sampling issues that impact a regulatory requirement, DOE would be informed and the matter discussed with Ecology at the appropriate level and time. ~~All assessments and surveillances are formally documented and logged in the Integrated Evaluation Plan and are available for review.~~	
86	p. B-4, Sec. B2. 1	No decontamination of sampling equipment is provided. Provide the pertinent detail of the procedure in summary format. The procedure will change with the basic decontamination protocols. Provide the decontamination process in this section.		Accept	Summary paragraphs describing the decontamination process are added to Section B2.1.	
87	p. B-13, Sec. B6	Provide why dangerous waste requirements are not used. CERCLA requirements are inappropriate for dangerous waste management.		Accept with Modification ~~No Change Needed~~	In order to provide a consistent waste management approach during groundwater well sampling activities which routinely are conducted for both RCRA and CERCLA actions, a common waste management plan is used for both actions. Both actions will follow the	

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					requirements of WAC 173-303 for container waste storage, packing, labeling, and eventual waste disposal. Additional details of the waste management process are added to Section B6. ~~DOE/RL-97-01 states "This document also includes the requirements for the management and disposal of waste generated from activities such as monitoring conducted at OU groundwater wells, seeps, and/or aquifer sampling tubes…" Also DOE/RL-97-01 cites WAC 173-303 stating "Waste will be designated in accordance with Washington Administrative Code, WAC 173-303, "Dangerous Waste Regulations"… Packaging and labeling during waste storage and transportation must meet WAC 173-303...Waste will be managed in accordance with this plan and the substantive container management requirements established at WAC 173-303-630 and WAC 173-303-160…"~~	
88	p. C-1, Table C-2	The open intervals for several of the wells are missed calculated according to the elevation tops and bottoms. These are wells H4-8 (should be 3.0 m [9.9 ft]), and H4-84 (should be 3.8 m[l2.5 ft]). Provide Depth to Water (DTW) in elevation (meters and feet) to determime the remaining water in these wells.		Accept with Modification	Values for 199-H4-8 changed as per comment. A typo for elevation top at 199-H4-84 was identified and corrected. The open interval length for 199-H4-84 is correct after correction of the typo. The amount of remaining water in the wells is presented in Table 3-2 of the main document.	
89	p. D-1, Sec. DI, Line 6	Change "Chapter l" to "Unit 2".		Accept	Change made per comment.	

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90	p. D-1, Sec. DI, Line 8	The specifc concentration limit is actually 122 ug/L in the Permit under Chapter 3 Part VI, Unit 2, not 100 ug/L. Section 3 .1.1.2 of DOE/RL-97-48 provides the same concentration value for filtered total chromium of 122 ug/L. This document will change it to 48 ug/L, not 100 ug/L.		Accept ~~Not accepted~~	As agreed at the January 19, 2016 meeting with Ecology, the concentration limit for total chromium filtered is 48 µg/L. ~~As agreed at the ECY/DOE/PRC meeting held 08/19/15, the concentration limit is the same as the background value for total chromium (collected as a filtered sample) at 100 µg/L.~~	
91	p. D-7, Sec. D2	WA 7890008967 reference: This is not the title of the document. The title of the document is "Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, For the Treatment, Storage, and Disposal of Dangerous Waste, Revision 8C. Please change.		Accept	Title changed per comment 10.	