



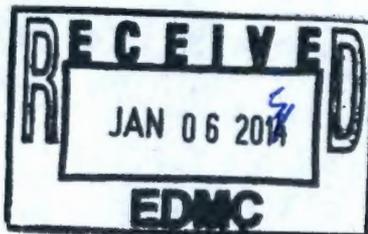
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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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December 31, 2014

14-NWP-259



Mr. Michael Cline, Federal Project Director
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: A5-11
Richland, Washington 99352

Re: Comments on Groundwater Sampling and Analysis Plan for the 200-PO-1 Groundwater Operable Unit (DOE/RL-2014-31, Draft A)

Dear Mr. Cline:

Enclosed are the Department of Ecology (Ecology) comments on the Groundwater Sampling and Analysis Plan (SAP) for the 200-PO-1 Groundwater Operable Unit.

Ecology cannot approve this SAP at this time, since it references information in a supplemental remedial investigation (RI) that has not been submitted to Ecology for review and comment. Ecology will approve the SAP once the comments on the SAP and supplemental RI have been resolved to Ecology's satisfaction.

If you have any questions, please contact me at nina.menard@ecy.wa.gov or (509) 372-7941, or Kim Welsch, 200 Area Environmental Restoration Lead, at kim.welsch@ecy.wa.gov or (509) 372-7882.

Sincerely,

Nina M. Menard
Environmental Restoration Project Manager
Nuclear Waste Program

Enclosure

cc electronic w/enc:

- Dennis Faulk, EPA
- Emerald Laija, EPA
- Rod Lobos, EPA
- Jim Hansen, USDOE-RL
- Naomi Jaschke, USDOE-RL
- Alaa Aly, CHPRC
- Marty Doornbos, CHPRC
- Curt Wittreich, CHPRC
- Ken Niles, ODOE
- Nina Menard, Ecology
- Kim Welsch, Ecology
- Cheryl Whalen, Ecology
- CHPRC Correspondence Control

- USDOE-RL Correspondence Control
- Environmental Portal
- Hanford Facility Operating Record

cc w/enc:

- ✓Administrative Record: 200 Area
- NWP Central File

cc w/o enc:

- Stuart Harris, CTUIR
- Gabriel Bohnee, NPT
- Russell Jim, YN
- Steve Hudson, HAB
- NWP Reader File

200-PO-1
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Document Title(s)/Number(s):
Groundwater Sampling and Analysis Plan for the 200-PO-1 Groundwater Operable Unit (DOE/RL-2014-31, Draft A)

Document Lead/Phone #/email: Kim Welsch 372-7882 kiwe461@ecy.wa.gov

Project Manager/Phone #/email: Nina Menard 372-7941 nmen461@ecy.wa.gov

Item # Page # Section # Line/¶ #s	Comment and Basis/Justification	Modification Needed	DOE Response	Ecology Response	O/C
Item 1 General P:1-18 S:1.2.3 L/¶:21-3 P:1-3 S:1.1 L/¶:38-9	<p>Comment: This SAP includes only the contaminates that currently exists in the groundwater and does not include any contaminants that exist in the vadose zone</p> <p>The following sentence from Page 1-18, lines 21 to 23 acknowledge, "Uncertainty exists with regard to future vadose zone contributions to groundwater from the overlying source waste sites. Potential future GW impacts from waste sites or vadose zone contamination will be assessed as part of the CERCLA RI/FS process for the associated source OUs...."</p> <p>These two sentences acknowledge that there is a concern of vadose zone contamination that will impact 200-PO-1 groundwater in the future.</p> <p>This portion of the SAP states, "The RI characterization activities have been completed, and the RI report was issued in October 2012 (DOE/RL-2009-85)."</p> <p>This statement does not include the fact that a supplemental RI will be submitted in June 2015. The Ecology signature/acceptance letter for the RI stated a caveat that DOE will adequately characterize and include potential vadose zone contaminant impacts and add this information to the RI that was signed in October 2012. DOE committed to this through agreeing to provide a supplement to the RI with this information. However, recent modeling and risk presentations given by DOE do NOT include acceptable vadose zone contaminant information to adequately evaluate and model risk to 200-PO-1 GW.</p> <p>Basis/Justification: DOE is not adequately addressing the nature and extent of contamination within the 200-PO-1 GW OU: specifically DOE is not adequately evaluating the potential for future GW contamination and contaminant migration pathways from the contaminated vadose zone. This, in turn, does not meet an acceptable CSM, associated risk evaluations, or relatively short term (approximately next 50 years) modeling estimates.</p>	<p>Revise this SAP to include adequate vadose zone contaminate data/contributions/analysis activities that will be added to the RI, revise risk and modeling to include additional vadose zone information and analysis that is acceptable to Ecology. A source of this information can be found in the Final Tank Closure & Waste Management Environmental Impact Statement (DOE/EIS-0391). Please include the pertinent information from the EIS in this SAP to address the potential vadose zone contribution to the groundwater in the next 50 years.</p> <p>This SAP will not be approved until the supplemental RI has been submitted and reviewed by Ecology.</p>			
Item 2 P:1-1 S: 1.0 L: 16-23	<p>This SAP cannot supersede a RI/FS work plan or its accompanying change notices.</p>	<p>Delete the RI/FS work plan and Change notice citations. If parts of the RI/FS work plan are being modified, then this needs to be changed thru the TPA change notice process.</p>			
Item 3 S: 1.1 P: 1-2 L: 8-13	<p>This paragraph describes that the water level monitoring data will be collected under a different monitoring plan. The paragraph does not describe how this information will be reported to Ecology in order to correlate with the information collected in accordance with this SAP</p>	<p>Add a sentence that states how this information will be reported to Ecology</p>			

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Item 4 P: 1-2 S: 1.1 L: 14	The first sentence in this paragraph states "Groundwater monitoring of the basalt-confined aquifer is not within the scope of this SAP." There is no description as to where this basalt confined aquifer is located in the 200 Area.	Add description of where this basalt confined aquifer is located in relation to the 200-PO-1 OU.			
Item 5 P: 1-2 S: 1.1 L: 27-32	This sentence states "This COPC list has been further refined as the result of a recent supplemental RI groundwater evaluation based on six years of data considered representative of current groundwater conditions (samples collected between January 2008 and January 2014).	The supplemental RI has not been submitted to Ecology for review and comment. Therefore, the COPC list cannot be reduced. Add trichloroethene, and tetrachloroethene back into this SAP.			
Item 6 P: 1-2 S: 1.1 L: 40-41	This bullet states that the tritium plume has attenuated in the Far Field area and decreased in extent over the last decade. The overall plume has decreased in size approximately 44 percent since 1996. No reference is noted for this statement	Add reference for the statement that the plume has decreased approximately 44%.			
Item 7 P: 1-3 S: 1.1 L: 6-9	This paragraph states that plumes that could encroach into the 200-PO-1 OU are not a part of this SAP. However, information needs to be added that states how close these other plumes are to encroaching on to this OU and which OU they are currently being monitored in.	Add a description of where these other plumes are and how close they are to encroaching on the 200-PO-1 OU. Also evaluate whether the bordering wells need to be monitored for these contaminants.			
Item 8 P: 1-3 S: 1.1 L: 10-13	This paragraph describes the RCRA interaction with this SAP. It doesn't state that samples to comply with the RCRA SAP and the 200-PO-1 SAP will be collected and analyze concurrently.	Add a sentence that states that one sample will be collected and analyzed to fulfill the requirements of both SAPs.			
Item 9 P: 1-3 S: 1.1 L: 38-40	This sentence states "The RI characterization activities have been completed, and the RI report was issued in October 2012 (DOE/RL-2009-85). This is inaccurate since Ecology required and DOE agreed to provide a supplemental RI which required additional sampling and analysis.	Please add this information or change the statement. The supplemental RI has not been submitted yet to Ecology and the supplemental RI needs to be reviewed before Ecology will approve this SAP.			
Item 10 P: 1-4 S: 1.1 L: 26-27	This sentence states: "Monitoring under this plan for the six COPCs will continue until a remedial decision is made." Reducing the COPCs from eight to six is not approved. Justification for this reduction is in the supplemental RI which has not been reviewed or approved by Ecology	Change sentence from six COPCs to eight COPCs.			
Item 11 P: 1-21 S: 1.2.4.1 L/¶: 9	Comment: More information should be provided on the DOE derived concentration standard (DCS) for I-129. Basis/Justification: DOE standards should be described more fully, since not all reviewers are familiar with these.	Note that the cited DCS for I-129 (330 pCi/L) is for ingested water, corresponding to an annual effective dose of 1 mSv (100 mrem).			
Item 12 P: 1-23 S: 1.4	Comment: In terms of selecting COPCs for 200-PO-1, consider COPCs from the US Ecology site due to its proximity (i.e., Cr+6, cis-1,2-DCE, nitrate, TCE, 1,1-DCA, chloroform). In addition, "chemicals of interest" (COIs) at US Ecology (i.e., U,	COPCs and COIs at US Ecology should be considered for 200-PO-1 (Cr+6, cis-1,2-DCE, nitrate, TCE, 1,1-DCA, chloroform, U, vinyl			

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L/¶:34-38	vinyl chloride, and bis[2-ethylhexyl]phthalate) should also be considered. Basis/Justification: COPCs in waste sites overlying the 200-PO-1 OU should be evaluated for 200-PO-1.	chloride, bis[2-ethylhexyl]phthalate).			
Item 13 P:1-23 S:1.4 L/¶:34-38	Comment: This is a comment on a revised version of Section 1.4 on COPCs (revised file dated 10/22/14?). <u>PCE</u> : Although the standard MTCA Method B CUL for groundwater (1E-6 cancer risk) has been revised from 0.081 µg/L to 20.5 µg/L, the current MTCA Method B CUL is 5 µg/L (MCL). Since all PCE detections are below the CUL of 5 µg/L (MCL), PCE can be eliminated. <u>TCE</u> : Although the standard MTCA Method B CUL for groundwater (1E-6 cancer risk) has been revised from 0.49 µg/L to 0.54 µg/L, the current MTCA Method B CUL is 4 µg/L (adjusted MCL). Revised text specifies that most results are nondetects, although it is not entirely clear how detected results compare to the CUL of 4 µg/L (adjusted MCL). Please retain TCE, pending further clarification. Basis/Justification: Elimination and retention of COPCs needs to be defensible.	Eliminate PCE (detects<CUL). Clarify how TCE detects compare with CUL, as a basis for its retention or elimination.			
Item 14 P: 1-23 – 1-24 S: 1.4 L/¶: Table 1-2	Comment: The contaminant list is too short, in part due to pooling of data from multiple wells. Basis/Justification: The table is based on both the PO-1 RI (DOE/RL-2009-85, Rev. 1) and a supplemental baseline risk assessment which will be given in a document that has not been written yet. In the PO-1 RI document, data from multiple wells were pooled for calculating groundwater EPCs and eliminating COPCs. <ul style="list-style-type: none"> This aggregation step is inconsistent with the definitions of EPC. Exposure point can be defined as “a location of potential contact between an organism and a chemical or physical agent” (USEPA, 1989). The EPC has also been defined as a “conservative estimate of the average chemical concentration in an environmental medium” (USEPA, 2002). This definition is further described: “The EPC is determined for each individual exposure unit within a site. An exposure unit is the area throughout which a receptor moves and encounters an environmental medium for the duration of the exposure” (USEPA, 2002). Therefore, this latter definition would vary based on the exposure scenario. For a residential scenario, the exposure unit would be the residential property with a single drinking water well. Aggregation neglects the requirement in WAC 173-340-720(8) that the standard point of compliance for groundwater is “throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be affected by the site.” Furthermore, guidance 	Evaluate risk and hazard on a well-by-well basis, and include contaminants that contribute greater than 1% to risk and/or hazard, and include those that exceed regulatory standards.			

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	<p>from USEPA (OSWER 9355.0-129, 2013) states "In analyzing whether the aquifer has been remediated to cleanup levels selected in the ROD, EPA generally should first consider evaluating contaminant concentration levels for each COC on a well-by-well basis." By aggregating data from multiple wells, wells that currently exceed cleanup levels are averaged with those that do not. This can result in elimination of contaminants that are unique to a few or a subset of wells. Ultimately, no remedies will be developed for these contaminants and the associated wells will potentially remain out of compliance into the future. Unless the remedies ultimately selected for the retained contaminants in Table 1-2 can also treat VOCs such as trichloroethylene (TCE), tetrachloroethylene (PCE), and carbon tetrachloride, and treat various metals, these contaminants may remain out of compliance in PO-1 beyond implementation of the remedies, and will be unmonitored.</p>				
<p>Item 15 P: 1-23 – 1-24 S: 1.4 L/¶: all</p>	<p>Comment: Monitoring of PO-1 wells should include all of the contaminants in Table 1-2 of DOE/RL-2014-31 (Draft A) plus those in Table 6-14 of the 200-PO-1 RI, and those listed below. The contaminants that should be monitored are ICP-metals, VOCs (which would include TCE, PCE, and carbon tetrachloride), hexavalent chromium, and selected radionuclides.</p> <p>Basis/Justification: Ecology has examined the data set provided for 200-PO-1, covering well sampling results from 2008-2013, and has determined a number of wells and associated contaminants that need additional consideration and further monitoring. These wells and contaminants include:</p> <p><i>Well 299-E16-2</i> Associated Unit: 261-A-30 Trench, southeast of A Farm complex, and east of PUREX Carcinogens: Arsenic, I-129, tritium, Sr-90 Hazards: Arsenic, vanadium</p> <p><i>Well 299-E17-1</i> Associated Unit: 216-A-10 Carcinogens: Tc-99, I-129, tritium, uranium Hazards: Cobalt, iron, nitrate (N), manganese, uranium, vanadium</p> <p><i>Well 299-E24-20 (and 299-E-24-22)</i> Associated Unit: 216-A-9 Carcinogens: Arsenic, I-129, Tc-99, tritium,</p>	<p>Monitor for ICP-metals, VOCs, and hexavalent chromium in the areas where they have been observed in the past, and adjust the remedies to treat these contaminants.</p>			

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	<p>Hazards: Arsenic, nitrate (N), silver, vanadium</p> <p><i>Well 299-E24-23</i> Associated Units: PUREX and/or 216-A-27; UPRs-200-E31, -E96, -E22; 241-A-131, Carcinogens: I-129, n-nitrosodi-n-dipropylamine, Tc-99, Sr-90, trichloroethylene, tritium, uranium isotopes Hazards: Nitrate (N), uranium, 2,6-dinitrotoluene, trichloroethylene</p> <p><i>Well 299-E25-19</i> Associated Units: 216-A-6 Carcinogens: Arsenic, I-129, Tc-99, tritium Hazards: Arsenic, manganese, nitrate (N), silver, vanadium</p> <p><i>Wells 299-E25-20 and -22</i> Associated Unit: 216-A-27 Carcinogens: Arsenic, bis(2-ethylhexyl)phthalate, I-129, tritium, Sr-90 Hazards: Arsenic, manganese, nitrate (N), vanadium</p> <p><i>Well 299-E25-236</i> Associated Unit: 241-AP Carcinogens: I-129, tetrachlorodibenzo-p-dioxins, pentachlorodibenzo-p-dioxins, Tc-99, tritium Hazards: Hexavalent chromium, nickel, nitrate (N), silver</p> <p><i>Wells 299-E25-28 and -34</i> Associated Unit: 216-A-29 Carcinogens: Arsenic, I-129, tritium Hazards: Arsenic, vanadium</p> <p><i>Well 299-E25-29P</i> Associated Unit: 216-A-31 Carcinogens: Arsenic, I-129, tritium Hazards: Arsenic, nitrate (N), vanadium</p> <p><i>Well 499-S0-7, -S0-8, -S1-8</i> Associated Unit: 400 Area Carcinogens: Bromodichloromethane, dibromochloromethane, tritium Hazards: Bromodichloromethane, dibromochloromethane, cobalt, manganese,</p>				

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	<p>molybdenum</p> <p><i>Well 699-10-54A</i> Associated Unit: None Carcinogens: Trichloroethylene Hazards: Trichloroethylene, nitrate (N), thallium, TPH-diesel</p> <p><i>Well 699-12-2C</i> Associated Unit: 618-11 ? Carcinogens: Uranium isotopes, tritium, Tc-99 Hazards: Uranium, nitrate (N)</p> <p><i>Well 699-13-1A</i> Associated Unit: 618-11 Carcinogens: Arsenic Hazards: Arsenic</p> <p><i>Well 699-20-20</i> Associated Unit: Downgradient from NRDWL/600-CL Carcinogens: Arsenic, C-14, Tc-99, tritium Hazards: Arsenic, thallium</p> <p><i>Wells 699-22-35, 23-34A, 23-34B, 24-33, 24-34A, 24-34B, 24-34C, 25-34A, 25-34B, 25-34D and associated wells</i> Associated Unit: 600-CL/NRDWL Carcinogens: Carbon tetrachloride, methylene chloride, tetrachloroethylene, trichloroethylene, trichloroethane, dichloroethane, chloroform Hazards: Nitrate (N), vanadium, tetrachloroethylene, trichloroethylene, carbon tetrachloride</p> <p><i>Well 699-29-4</i> Associated Unit: None Carcinogens: Arsenic, I-129, Tc-99, tritium Hazards: Arsenic, thallium</p> <p><i>Well 699-31-11</i> Associated Unit: None Carcinogens: C-14, I-129, Tc-99, tritium Hazards: Iron, nitrate, thallium</p>				

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	<p><i>Well 699-32-22B:</i> Associated Unit: None Hazards: Iron, manganese, zinc</p> <p><i>Well 699-32-43</i> Associated Unit: None; located below BC Controlled Area Carcinogens: Methylene chloride, I-129, tritium, uranium isotopes Hazards: Nitrate, vanadium</p> <p><i>Well 699-41-23</i> Associated Unit: None Carcinogens: I-129, tritium Hazards: Chromium (above MCL)</p> <p><i>Well 699-42-40A</i> Associated Unit: 216-B-3C Carcinogens: Tritium Hazards: Manganese, iron</p> <p><i>Well 699-43-44</i> Associated Unit: 216-B-3 Carcinogens: Arsenic, I-129, tritium Hazards: Arsenic, vanadium</p> <p><i>Well 699-43-45</i> Associated Unit: 216-A-29 Carcinogens: Arsenic, I-129, tritium Hazards: Arsenic, vanadium</p> <p><i>Well 699-S6-E4A, -E4E, -E4K, -E4L</i> Associated Unit: 618-10 Carcinogens: Carbon tetrachloride, methylene chloride, Tc-99, tritium, uranium isotopes, bis(2-ethylhexyl)phthalate, trichloroethylene Hazards: Carbon tetrachloride, cobalt, nitrate (N), uranium, nickel, trichloroethylene</p> <p><i>Well 699-S8-19</i> Associated Unit: None Carcinogens: Arsenic</p>				

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	Hazards: Arsenic, nitrate (N)				
Item 16 P:2-13 S:2.2.1 L/¶:Table 2-3	<p>Comment: Re uranium (U) in Table 2-3, the MTCA Method B CUL for groundwater would default to Hanford groundwater background (9.9 µg/L=90th percentile value, DOE/RL-96-61, Rev 0), because the MCL (30 µg/L) needs to be adjusted downward to HQ=1 (9.6 µg/L) per WAC 173-340-720[7][b].</p> <p>Basis/Justification: The MTCA Method B noncancer CUL for U in groundwater (9.6 µg/L, corresponding to HQ=1) is derived with an oral RfD=6E-4 mg/kg-d (EPA, Office of Groundwater and Drinking Water) per USEPA memo from Marc Stifelman (dated 8/7/2008).</p>	Please revise the WAC value for U in Table 2-3 from 30 µg/L to 9.9 µg/L.			
Item 17 P:2-13 S:2.2.1 L/¶:Table 2-3	<p>Comment: Re Table 2-3, in addition to MCLs, other regulatory criteria (both human and eco) apply where groundwater discharges into surface water (Columbia River). For human health, MTCA Method B surface water CULs (WAC 173-340-720[4][b][ii], -720[8][d], and -730[6][b]) should be met, along with criteria specified in the Clean Water Act and National Toxics Rule (WAC 173-340-730[3][b]) for nonrads. For ecological receptors, state surface water quality standards (WAC 173-201A) and criteria specified in the Clean Water Act and National Toxics Rule (WAC 173-340-730[3][b]) for nonrads apply, along with USDOE biota concentration guides (BCGs) for rads in water and sediment (DOE-STD-1153-2002).</p> <p>Basis/Justification: Regulatory criteria for surface water and sediment may apply where groundwater discharges into surface water.</p>	Re Table 2-3, include surface water and sediment criteria for human health and eco receptors (for rads and nonrads), because groundwater discharges into the Columbia River.			
Item 18 P: 3-1 S:3.1 L: 6-8	This sentence states: "These objectives are accomplished in the field by sampling groundwater at designated wells and analyzing the samples for the COPCs and supporting constituents. " What are the supporting constituents	Add a description (list) or reference to describe the supporting constituents.			
Item 19 P: 3-5 T: 3-3	There are numerous wells on this table that are designated as non-compliant	As available, add the year that the well is scheduled to be replaced with a compliant well through the M-24 Milestone process. If not on the list then add TBD.			
Item 20 P: 3-14 F: 3-3	The figure for the nitrate plume has a round plume around well 39-39. One well to monitor this plume is not enough to determine source and/or movement	Add wells to monitor movement to both upstream and downstream of this plume.			
Item 21 P: 3-16 F: 3-5	This figure for the far field Iodine-129 plume indicates that the wells in front of the plume are not compliant and are too few in number. Also, the LIGO Facility wells are not indicated on the map. Especially the 2000' TD well.	Add wells to the M-24 milestone to replace noncompliant wells and to increase the number of wells that are at the leading edge and in front of the plume. Also add the LIGO wells to the figure and the requirement to secure the analysis results			

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		from the LIGO wells to see if the contaminant levels are trending up.			
Item 22 P:3-19 to 3-21 S:3.2.1.1 L/¶:Figures 3-8 to 3-10	Comment: Figure captions for well networks should indicate near or far field locations. Basis/Justification: Figure captions should be informative.	Insert "Near Field" into figure captions for Figures 3-8 to 3-10 (U, Sr-90, Tc-99).			
Item 23 P:A-4 (App A, Part 1) S:A2.2.4 L/¶:8-10	Comment: Perhaps quarterly monitoring of rad COPCs, in some cases, should be considered to be consistent with AEA radionuclide monitoring requirements and to capture short term variation. Basis/Justification: Spatial and temporal variation in concentrations of groundwater COPCs needs to be adequately characterized.	Consider quarterly monitoring of radionuclide COPCs in cases exhibiting more rapid changes.			
Item 24 P:A-1 to A-57 (App A, Part 2) S:Tables A3-1 to A3-6 L/¶:	Comment: Methods for handling nondetects should be specified. Basis/Justification: Statistical methods should be described.	Describe how nondetects are handled in statistical calculations.			