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DEPARTMENT OF ECOLOGY

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December 21, 2020

20-NWP-200

Michael W. Cline, Director
Soil and Groundwater Division
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: H5-30
Richland, Washington 99352

Re: Department of Ecology's (Ecology) Review Comment Record on the *Groundwater Monitoring Sampling and Analysis Plan for the 100-HR-3 Groundwater Operable Unit, DOE/RL-2017-13-ADD1, Draft A*

Dear Michael W. Cline:

Ecology reviewed the *Groundwater Monitoring Sampling and Analysis Plan for the 100-HR-3 Groundwater Operable Unit, DOE/RL-2017-13-ADD1, Draft A*.

Enclosed is the Review Comment Record with Ecology's comments.

If you have any questions, please contact me at kim.welsch@ecy.wa.gov or (509) 372-7882, or Alicia Boyd, Environmental Specialist, at alicia.boyd@ecy.wa.gov or (509) 372-7934.

Sincerely,

Digitally signed by Welsch,
Kim (ECY)
Date: 2020.12.21 10:10:39
-08'00'

Kim Welsch
Interim Environmental Restoration Project Manager
Nuclear Waste Program

bj/aa
Enclosure

cc: See page 2

cc electronic w/enc:

Laura Buelow, EPA
Dave Einan, EPA
Steve Balone, USDOE-RL
Mark French, USDOE-RL
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Alicia Boyd, Ecology
Brian Johnson, Ecology
Nina Menard, Ecology
Kim Welsch, Ecology
NWP RIM Coordinators, Ecology
Environmental Portal
Hanford Administrative Record
Hanford Facility Operating Record
CHPRC Correspondence Control
MSA Correspondence Control
USDOE-RL Correspondence Control

Review Comment Record (RCR)

Groundwater Monitoring Sampling and Analysis Plan for 100-HR-3 Groundwater Operable Unit,
DOE/RL-2017-13-ADD1, Draft A

Tracking_ID	Chapter	Section	Page_Num	Line_Num	Table_Figure	Comment_Basis	Modification_Needed
	1		1.1	1		The previous version of the SAP (DOE/RL-2017-30) mentions in Sections 1 and 1-1 that sitewide surveillance (AEA), riverbank seeps, RCRA, and confined aquifers monitoring programs, as well as contaminant plumes that originated outside of the 100-HR-1 OU are not part of the 100-HR-3 SAP monitoring program. I did not see these statements in this update to the SAP. The previous SAP introduction also mentions how new extraction or injection wells will be added to the SAP. These topic should be briefly mentioned in this revision, specifically which Hanford monitoring programs that extend into the 100-HR-3 OU area are not covered by this SAP.	Briefly mention at the end of the introduction section, which Hanford groundwater monitoring programs that overlap into 100-HR-3 are not part of this SAP.
	1		1.1	12-13		The sentence states that performance monitoring of the contaminants of concern (COCs) in the groundwater as a component of the MNA remedy will be performed until cleanup levels are met. Wouldn't this also be true for the P&T actions? The sentence before this mentions both the P&T and MNA.	Suggest removing MNA from the sentence. Also suggest describing the four monitoring steps (performance, operational, compliance, attainment or add a call-out to Section 2.1.2.4 of the RD/RAWP (Draft A)).
	1		1.1	14-16		The sentence states attainment monitoring demonstrates that groundwater cleanup levels have been achieved for contaminants remediated through MNA. What about the P&T system (Sr-90 MNA is the long pole in the tent but not mentioned till Section 1.5). The last paragraph of Section 1.5 states the attainment and compliance monitoring will be performed when cleanup levels for each COC are achieved. More explanation is needed to distinguish the difference between the P&T and the MNA actions.	Suggest removing MNA from the sentence or provide more explanation.
	1	1-1	1-4	5-7		The first sentence discusses MNA remedy while the second sentence mentions the DQO process was used to select monitoring locations and frequencies. Is the second sentence just for the MNA process?	Suggest adding that the DQO process was used to identify the monitoring locations and frequencies for the RD/RAWP remedies (or) move the DQO sentence to the end of the paragraph.
	1	1-1	1-4	11-13		The sentence states that attainment monitoring for Sr-90 and nitrate MNA will be conducted during the rebound study and compliance monitoring phase of Cr(VI). The dates of the remedies are not discussed till Section 1.5 (Cr = 12 years, Nitrate = 6 years, Sr-90 = 44 years). More discussion is required.	Additional explanation is required or move this discussion to Section 1.5. Also, in the redline version of RD/RAWP Draft A, I could not find a 'Table 4-3' as mentioned in line 12-13 of this SAP?
	1	1-1	1-4	13-15		The RD/RAWP (Draft A) describes the Attainment Monitoring process and time frame criteria which is helpful to understand the monitoring criteria requirements.	Reference the section in the RD/RAWP where the Attainment Monitoring process and time frame criteria is discussed.
	1	1.2.1	1-4	37		Prior to discussing the unconfined aquifer, a brief description of the vadose zone and the general depth to groundwater should be included.	Add a description of the Vadose zone and the general depths to groundwater prior to discussing the unconfined aquifer. Suggest paraphrasing the information from the RD/RAWP Draft A, Section 1.4.3.1.
	1	1.2.1	1-5	1-2		Suggest further discussion be added, similar to that in the previous version of the SAP (DOE/RL-2017-30, page 1-6, lines 9-12): 'The thickness of the unconfined aquifer is determined by the difference between the water table elevation and the surface of the RUM, which forms the bases of the unconfined aquifer. Aquifer thickness is greatest where the RUM surface has dips, forming what appears to be scour channels.'	Add a short description about the thickness of the unconfined aquifer including RUM depressions and scour channels.

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	1	1.2.1	1-6	29-31		The sentence that starts on this line reads 'Wells currently drilled and completed within the RUM' Using the words currently drilled seem arbitrary, especially as this document matures.	Modify the beginning of the sentence to state 'Wells completed within the RUM'
	1	1.2.2.1	1-7	7-9		The sentence seems to state the D-Area inland groundwater flow moves westerly across the Horn towards the 100-H Area. I do believe groundwater has to flow easterly or northeasterly to get from D-Area to H-Area. Also check the other flow directions mentioned in this paragraph. Should the gradient in D-Area be stated as northwest to northeast, and within the eastern section of the Horn should it be stated as northeasterly to easterly?	The general groundwater gradient across the Horn has to be easterly to get from D-Area to H-Area (not westerly). Check the other flow directions mentioned in the paragraph.
	1	1.2.2.1	1-7	32-34		The statement that typically contaminant concentrations are lower during high river stage is true but is an oversimplification. Should mention that in some localized areas where continuing sources are suspected in the PRZ, it is more complicated.	Mentioning that where continuing sources are present in the PRZ, it is more complex. Consider paraphrasing the information from the RD/RDWP (Draft A redline, Section 1.4.3.3, last two paragraph).
	1	1.2.2.1	1-10	2		Was the three-point analysis process developed for the RI/FS or is it from a RI/FS reference?	Check and add a reference, if needed.
	1	1.2.2.1	1-10	7-14		In the beginning of the paragraph a hyphen is used to describe north-northwest but after that, slashes are used (i.e., north/northwest).	Suggest using one method to describe the directions.
	1	1.2.2.2	1-10	16-22		This paragraph has a few statement of facts (values and conclusions) and therefore, should add a reference (e.g., RI/FS).	Add a reference as to where this information can be found.
	1	1.2.2.2	1-11		Figure 1-5	In the figure legend, a diamond symbol is used to identify the RUM Monitoring Wells but the diamond symbol is also used as points in the river (probably a river level measurement or a groundwater contouring control point)? This needs to be explained.	Add a footnote to the figure or explain in the second paragraph of Section 1.2.2.2 what these river points represent.
	1	1.2.3	1-12	8-9		Since this section is on sources of contamination, add a paragraph similar to that from the previous SAP (DOE/RL-2017-30, page 1-18, Lines 19-22) which describes the results of previous source 100 D/H removal actions: Contaminant sources in the vadose zone have primarily been remediated through excavation activities. Cr(VI) in groundwater is being actively remediated by the P&T systems. Nitrate contamination in the groundwater remains only in small localized areas and is also captured by the P&T systems. Other historical PCOCs in groundwater include strontium-90, tritium, and uranium have attenuated or are localized.	Discuss the previous source and vadose remedial actions and summarize the results (as was done in the previous version of the SAP (DOE/RL-2017-30).
	1	1.2.3	1-12	9-10		Since there are not many suspected source areas, it would be helpful to add bullets listing the areas (from SCW-64372). At the end of the sentence mention the PRZ and the mechanism that potentially add concentrations to groundwater. Mention any plausible deep sources (such as depressions on top of the RUM or the RUM permeable zones) that may be acting as potential sources to the unconfined aquifer.	Briefly list the potential sources areas that may be impacting the unconfined aquifer.
	1	1.2.3.1	1-12	36-37		Please describe what 45 mg/L of Nitrate represents (i.e., cleanup level).	Identify what 45 mg/L represents.

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	1	1.2.3.2	1-12	42-43		For descriptive purposes, add a short explanation as to the reason and objectives of the infiltration test.	Briefly state the objective of the 1967 infiltration tests. Suggest something similar to: the test was conducted as part of a study to determine disposal trench infiltration rates. For this study, reactor coolant water was disposed to an existing trench at D-Area for a four-month period in 1967 to observe and determine infiltration rates for disposal.
	1	1.2.3.2	1-13	9		Add a call-out to a Figure (such as Figure 1-5) that shows the location of well 699-97-60.	Identify the figure that shows the location of well 699-97-60.
	1	1.2.4	1-13	16-17		Suggest mentioning that contaminated groundwater from D-Area migrated and spread across areas of the Horn, causing a large area of low to moderate levels of Cr(VI)	Suggested modification to explain how plumes moved into and across the Horn.
	1	1.2.4	1-13	25-26	Figures 1-6 through 1-11	A couple observations: (1) The sentence refers to the Hanford Site GWMR for 2018 yet the following Figures (1-6 through 1-12) present 2019 plume maps. (2) The figures use control points which needs to be explained.	Please decide on which year of the Hanford Site GWMR will be used. Discuss the use of plume map control points either as a footnote to the figures or at the end of the sentence which can be something as simple as 'including the use of control points as depicted in Figures 1-6 through 1-11.'
	1	1.4	1-21	9-10		The sentence states Table 1-1 list the analytes that may be sampled for within the 100-HR-3. To me you are either going to sample for these in all or some of the sampling locations or they would not be on the list.	Explain in your response to this question, the use of the phrase 'may be sampled for'.
	1	1.4	1-21		1-1	The table lists "General chemistry" as the rationale for several of the analytes within the table. More specificity is needed for the basis of this rationale for inclusion. For example, the anions which have been classified as such will be tested as the result of the analytical method to be used to analyze the COCs, nitrate and sulfate. A similar explanation is appropriate for the metals magnesium, potassium and sodium which have also been classified with the "General chemistry" rationale. Therefore, it can be assumed that method-based analysis is the accurate rationale for the analysis of these analytes. Please elaborate on this within the text.	Provide a technical explanation for the inclusion of the "General Chemistry" analytes.
	1	1.4	1-21 to 1-22		Table 1-1	Table 1-1 observations: (1) Any reason why alkalinity, chloride, fluoride are center justified in the table cells yet the remaining analytes in the first column are left justified? (2) The rationale for Sulfate is stated as P&T byproduct. Is this due to the treatment process or is it from the aquifer being spread by the injections wells? (3) The need for Uranium and Tc-99 is stated as 'present at 183-H, tracking'. Since these are not COCs, more explanation is need (consider the reason as stated in the DQO Meeting Summary in Appendix A, PSQ 5C, Page A-37 which is short and sufficient).	These observations should be discussed, either as footnotes to the Table or explained in either Section 1.2.3 or Section 1.2.4.

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	1	1.5	1-22	3-5		This section implies that both the duration and years that cleanup will be achieved is a set duration for each COC. It is therefore assume that the base year is 2020 (the year of this report) and model predictions are therefore assumed based on the present P&T or planned P&T configuration. If the submittal of the RD/RAWP and this SAP slides into 2021 will these values be revised?	Please describe if the base year for these predictions is 2020 (and therefore, the durations for cleanup will decrease for every year after 2020 regardless of when the RD/RAWP is approved). If this assumption is wrong, please provide an explanation in your response as to the reasons.
	1	1.5	1-22	11-12		The cleanup levels for chromium and Cr(VI) were provided in the above paragraph but are not listed for nitrate or Sr-90 in this paragraph.	For consistency, add the cleanup levels for both nitrate and Sr-90.
	2	2.0	2-1	1-15		Many references in this paragraph that would be better presented with bullets and sub-bullets.	Consider bullets listing the references stated in the paragraph.
	2	2.1.2	2-5	1		The Header of Section 2.1.2 includes Well Decommissioning but the section paragraphs doesn't mention anything about well decommissioning and it doesn't belong in this section.	Remove Well Decommissioning from the section header. Well decommissioning should be discussed in the previous section (Section 2.1.1.15 - Well Drilling and Well Maintenance).
	2	2.1.2	2-5	1		Section 2.1.2 is part of Section 2.1 which is Project Management. At this point in the SAP, the document is starting to discuss performance, objective and criteria which should be it's own level-two header.	Section 2.1.2 should be it's own level-two section similar to the previous SAP (DOE/RL-2017-30). Title should be Section 2.2 - Quality Objective and Criteria, or something similar.
	2	2.1.3	2-5	27-32		The text states, "Analytical performance requirements will be applicable only to the analytes specific to this SAP." Explain if this pertains to the full list of analytes listed in Table 1-1.	Explain if the analytical performance requirements will be applied to the full list of analytes listed in Table 1-1.
	2	2.1.4	2-9	2-8		The text states, "Since COCs do not contain VOCs or immediately dangerous to life or health, priority will be given to the most mobile chemicals and transuranic radionuclides." In light of this analytical prioritization, it is necessary to explain the mobilities of the individual chemical COCs for this OU.	Explain the mobilities of the individual chemical COCs for this OU within text or in a table.
	2	2.1.5	2-9	11		The section on Specific Training/Certification is a bit limited. Suggest add more information as was done for the previous SAP (DOE/RL-2017-30).	Expand on this section, hitting on some of the more important training items from the previous SAP (DOE/RL-2017-30).
	2	2.1.6	2-10	10	Table 2-2	Lead regulatory agency is used in the table while Ecology is used in the text. Section 2.1.1.1 calls out Ecology as the lead regulatory agency.	Change 'lead regulatory agency' to 'Ecology' in Table 2-2.
	2	2.2.1	2-12	6-7		The sentence is in reference to choosing alternative analytical methods and states that a alternative new method shall achieve project DQO or better than the replaced method. Other stipulations are probably required such as who approves the method change and does the laboratory need to be accredited (DOE, Ecology, EPA) for the alternative method before use?	Additional explanation is needed as to the requirements to approve a substitute analytical laboratory method.
	2	2.2.3	2-18		2-5	In the "Data flags" footer of the table, include data flag "H" which will be applied for samples analyzed outside of the holding times.	Include data flag "H", which will be applied for samples analyzed outside of the holding times.
	2	2.2.3.2	2-19	2-5		Lines 2 through 5 lists the laboratory QC samples and abbreviations (where listed). Lines 12 through 36 provides more information on the samples types. The surrogate header has the abbreviation in the header but the remaining ones do not.	For consistency, check the use of abbreviations (have they all been includes and where should they be stated).

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	2	2.2.9	2-21	29-33		The text states, "Laboratory errors are reported to the SMR group through an established process. For reported laboratory errors, a sample issue resolution form will be initiated in accordance with applicable methods."	More elaboration is needed on the established process of the reporting of laboratory errors. For example, specificity on time requirements for reporting errors should be included.
	2	2.3.1	2-22	3		The text states, "A data usability assessment may be performed for the identified SAP activities."	Please explain how it will be determined if a data usability assessment will be warranted.
	2	2.3.2	2.22	14-16		The text states, "If an assessment finding results in sampling issues that affect a regulatory requirement, DOE would be informed and the matter discussed with the regulatory agencies."	Please also include that the assessment finding will become a permanent part of the analytical data package for future reference and for records management.
	2	2.4.1	2-22	30-32		The text states, "The OU Technical Lead performs data reviews to help determine if observed changes reflect potential data errors, which may result in submitting a request for data review on questionable data. The laboratory may be asked to check calculations or reanalyze the sample."	Please include that if it is deemed necessary to reanalyze a sample holding time requirements for that sample will still apply and must be followed.
	2	2.4.2	2-23	4-20		Explain if the planned data validation will be performed by a third-party.	See comment.
	2	2.4.2	2-23	4-20		In Line 4, suggest changing contractor to environmental contractor. This paragraph has multiple points.	Change contractor to environmental contractor. Suggest separating the paragraph into multiple paragraph to emphasize the points mentioned.
	2	2.4.3	2-23	22-36		Long paragraph that is hard to read - suggest separating into 2 to 3 paragraphs.	Suggest separating the paragraph into multiple paragraph to emphasize the points mentioned.
	3		3-1	3-5		For this section (Field Sampling Plan), the SAP mentions the DQO process in Appendix A and then the sample design in Appendix B. Since the DQO was held in Feb. 2020, yet this SAP Draft A is Sep. 2020, and that more HR-3 wells are expected to be installed in FY21; then the question is, what is the date or projected dates of the wells selected in Appendix B (are they the 2019 baseline wells regardless if more wells are added or selected P&T wells changes)?	Please specify at what point is the sample design for Appendix B; is it current as of Sep. 2020 or does it include wells to be installed in FY21 (if funded).
	3	3.3	3-2	14-16		The text states, "Samples are collected from the P&T facilities and analyzed for Cr(VI) to monitor system performance. Process sampling is conducted on a routine basis as described in the O&M plan (Table 4-2 in DOE/RL-2013-49, Rev. 1) and is not included herein." Please include this referenced table within this SAP. It is necessary to explain how the process samples will be analyzed for Cr(VI).	Include Table 4-2 from DOE/RL-2013-49, Rev. 1 into this SAP.
	3	3.3	3-2		3-1	Table 3-1 lists Cr(VI) as two separate parameter types; one of which being a field parameter. Explain which analytical method will be used to characterize Cr(VI) as a field parameter. In addition to this, the Field Measurements sections in Table 1-1 and Table 2-3 must be revised to include Cr(VI). The field instrumentation that will be used to characterize Cr(VI) must be included.	(1) Explain which analytical method will be used to characterize Cr(VI) as a field parameter. (2) Revise the Field Measurements sections in Table 1-1 and Table 2-3 to include Cr(VI).
	3	3.4	3-3	19		For purge water field measurements, temperature stabilization is listed as two consecutive measurements agreeing within 0.2 C (32.3 F). The 0.2 C is a difference, not an absolute temperature; therefore, the conversion to F seems wrong (thinking it should be about 0.36 F).	Review and correct the conversion of 0.2 C (difference) to that reported for F.

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	3	3.7	3-8	24-26		The text states, "If during the chain-of-custody process it is discovered that the custody tape has been tampered with or broken on the sample bottle, the sample will be analyzed but the results will include a flag to indicate that custody was broken." Include what data quality flag that will be used for samples when the custody tape has been tampered with or broken on the sample bottle. This data flag should also be included in the Data flags section of Table 2-5, Field and Laboratory Quality Control Elements and Acceptance Criteria.	(1) Include what data quality flag that will be used for samples when the custody tape has been tampered with or broken on the sample bottle. (2) Include the flag in the Data flags section of Table 2-5, Field and Laboratory Quality Control Elements and Acceptance Criteria.
	3	3.7.1	3-9	7-9		The text states, "If the dose rate on the outside of a sample container or the curie content exceeds levels acceptable by an offsite laboratory, the FWS (in consultation with the SMR organization), can send smaller sample volumes to the laboratory." If this is done please include that the decision to send a smaller sample volume will be documented and will become a permanent part of the analytical data package for future reference and for records management.	Include that if the decision is made to send a smaller sample volume to the laboratory, it will be documented and will become a permanent part of the analytical data package for future reference and for records management.
	3	3.7.4	3-10	7		Middle of the line "...hazardous wastesCarrier-specific requirements ...". Not sure if wastesCarrier is a typo or a correct identity?	Determine if wastesCarrier is a typo.
	5		5-1	8		The specific Hanford Site-specific health and safety plan(s) used should be cited. When the HASP is updated or a new HASP is adopted, this RAWP and SAP can be updated accordingly. A specific HASP is required under CERCLA. The following are required according to OSWER Publication 9285.1-02: The party responsible for the HASP should be clearly identified (DOE or contractor), EPA (and Ecology) must be provided the HASP and any changes to the HASP prior to implementation.	Update to include site specific health and safety plan(s) to be used under this RAWP/SAP for groundwater sampling purposes. Provide an electronic copy of the referenced SAP to Ecology. If the information in the redline RAWP Section 6.5 are current, either cite SGW-41472 S&GRP Site Specific Health and Safety Plan (HASP) as the pertinent document or refer back to Section 6.5 of the RAWP.
	Refs		6-2	22-24		Reference DOE/RL-2018-66 (2019) is the Hanford Site Groundwater Monitoring Report for 2018. Yet Appendix A is citing the Hanford Site GWMR for 2019 (2020). Since Appendix A is supporting the SAP, this reference and any conclusion stated, should be upgraded to the 2019 data GWMR.	Update reference and conclusion to the Hanford Site GWMR for 2019 (2020).
	App A	A1	A-1	19-25		The lines in question identifies the 7 steps for DQO development but following these steps through the rest of the appendix is not always clear. I believe Steps 1 and 2 are covered in Section A1 (Introductions) with Step 3 covered in Section A2 (Evaluation of the Data Needs)? Step 4 is obviously Section A3 (Defining the Boundary of the Study). Step 5 seems to be touched on in multiple sections but most like falls within Section A4 (Specification of Performance or Acceptance Criteria) which covers Step 6. Step 7 is A5 (Development of the Detail Plan for Obtaining Data).	Provide a roadmap linking the Sections to the 7 steps. The previous SAP (DOE/RL-2017-30) provided a much clearer roadmap with the sections headers and statements that are more inline with the DQO development steps.