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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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February 8, 2008

Mr. David A. Brockman
Richland Operations Office
United States Department of Energy
P.O. Box 550, MSIN: A7-50
Richland, Washington 99352

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EDMC

Re: Letter, from D. A. Brockman, USDOE, to J. A. Hedges, Ecology, and N. Ceto, EPA, Received October 2, 2007, *200-SW-1 Nonradioactive Landfills and Dumps Group Operable Unit and 200-SW-2 Radioactive Landfills and Dumps Group Operable Unit Remedial Investigation/Feasibility Study Work Plan, DOE/RL-200-60, Draft B; and Tri-Party Agreement Interim Milestone M-13-07-03 Change Package*

Dear Mr. Brockman:

The Department of Ecology completed the review of the *200-SW-1 Nonradioactive Landfills and Dumps Group Operable Unit and 200-SW-2 Radioactive Landfills and Dumps Group Operable Unit Remedial Investigation/Feasibility Study Work Plan (DOE/RL-200-60, Draft B)*.

Initial comments were due to the United States Department of Energy (USDOE) on November 29, 2007. Preliminary comments prepared by Ecology were electronically submitted to USDOE on November 15, 2007. However, the Work Plan, as submitted, was considered incomplete as supporting documentation cited within the Work Plan were not available during the regulatory review. These documents include:

- *Application of the Hanford Site Feature, Event, and Process Methodology to Support Development of the Conceptual Site Models for the 200-SW-2 Operable Unit Landfills (SGW-34462, Rev. 0)*
- *Data Quality Objectives Summary Report for Phase I-B Characterization of the 200-SW-2 Operable Unit Landfills (SGW-33253, Rev. 0)*
- *Treatability Investigations Supporting the 200-SW-2 Radioactive Landfills and Dumps Group Operable Unit (SGW-34463)*
- *Information and Data Management Plan for the 200-SW-2 Operable Unit (SGW-35016)*

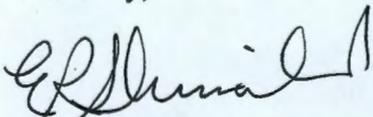
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Ecology received SGW-34462 on December 5, 2007, and SGW-33253 December 12, 2007, at which time the Work Plan review was re-initiated. We haven't received SGW-34463 and SGW-35016; and therefore, they were not considered during the review of the Work Plan.

The attached comments are comprehensive and include the initial comments submitted on November 15, 2008, and final comments prepared on January 30, 2008.

If you have questions, contact Deborah Singleton on 509-372-7923 or Jennifer Ollero on 509-372-7988.

Sincerely,



Ron Skinnarland
Waste Management Section Manager
Nuclear Waste Program

pll

Enclosure

cc: Nick Ceto, EPA
Stuart Harris, CTUIR
Gabriel Bohnee, NPT
Russell Jim, YN
Susan Leckband, HAB
Ken Niles, ODOE
Administrative Record: 200-SW-1/2, M-13-07-03
Environmental Portal

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1/30/2008

Review Complete

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5. Document Number(s)/Title(s)

200-SW-1/2 RI/FS Work Plan (DOE/RL-2004-60, Draft B)

Project Manager Name

Deborah Singleton

Reviewer Name

J. Ollero; M. Mandis; J. Vanni; J. Shea; N. Smith-Jackson; A. Huckaby

10. Agreement with indicated comment disposition(s)

Organization Manager (Optional)
Ron Skinnarland

10/23/2007 &
1/30/2008

Date

Reviewer/Point of Contract

Author/Originator

Reviewer/Point of Contact

Date

Author/Originator

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1.		General Comment: Review of the Work Plan cannot be completed until Ecology receives the following documents: SGW-34462 SGW-33252				
2.		General Comment: For document clarity, please include a table to the document which identifies all of the waste sites within the scope of this Work Plan and what sampling activities have been taken and what activities are planned through Phase 1B.				
3.		General Comment: The need for 100% topographical survey and reconnaissance was consistently voiced by Ecology representatives during the Phase II DQO meetings. Due to snow melt/rain/line rupture/etc. pooling/ponding (contamination drivers) and areas/spots where subsidence could occur (safety), topographical survey and reconnaissance (eg GPS) is	This comment is applicable throughout the Work Plan. Please ensure that the document addresses "topographical survey and reconnaissance".			

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		requested to be added as an additional activity to be conducted during Phase I-B. As stated during Phase II DQO meetings, this information is needed to support characterization design and ultimately CSM confirmation.				
4.		<p>General Comment: Use of term "past practice landfill"—This document identifies the non-RCRA TSDs as "past practice landfills". The TPA identifies these sites as "burial grounds" and not as landfills.</p> <p>Additionally, "past practice" landfill is not a defined term in the TPA or WAC.</p>	Replace the term "past practice landfills" with "burial grounds."			
5.	Title	The glossary's definition of "dump" (page xxv) implies "dumps" are no longer part of this operable unit. The word "dumps" just sounds bad.	It is recommended that the title of this document be: <i>200-SW-1 Nonradioactive Landfills Group Operable Unit and 200-SW-2 Radioactive Landfills Operable Unit Remedial Investigation/Feasibility Study Work Plan.</i>			
6.	Executive Summary, page vii.	The DQO process initiated in 2006 is briefly described. Because considerable progress was made on that DQO (i.e., many agreements), it is recommended that all agreements (actual text, lists of COCs, lists of COPCs, meeting notes, etc.) be included in an appendix. This information would benefit the reader in understanding future (i.e., Phase II) objectives that were agreed to during the DQO initiated in 2006. Even if the objectives generated during the 2006 DQO are not adopted verbatim in the Phase II workplan, there is benefit in including them as they provide justification of performing Phase IB (i.e., they highlight the complexity in scope	It is recommended that all agreements reached during the DQO that was initiated in 2006 be included in an appendix.			

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		and issues associated with the 200-SW-1 and 200-SW-2 OUs).				
7.	Page 4-1, Lines 19-21	<p>The text states:</p> <p>“Key decision makers from DOE, Ecology, and EPA participated in the process to develop the characterization approach outlined in the Phase I-B summary report (SGW-33252).”</p> <p>The DQO process which was attended by the 200-SW-1/2 Ecology technical team from October 2006 to February 2007 was for the work that would be completed in Phase II of the site investigation. The Phase II work was primarily intended to plan intrusive characterization (i.e.; analysis of soil samples). During the Phase II DQO from October 2006 to February 2007, the Ecology team was under the impression that our DQO efforts were being done to support the upcoming work plan (i.e., DOE/RL-2004-60). It was not brought to the attention of the Ecology team that a Phase I-B DQO was going to occur, and that the next issued work plan would be a product of those efforts.</p>	<p>Until Ecology has the opportunity to review SGW-33252, it is not possible to provide a complete recommended change for this item. Until further notice, only the following edit is necessary:</p> <p>Please provide clarification on what was done to develop the Phase 1B.</p>			
8.	xxv/line 24 7	Glossary: Please include the WAC citation for the definition of “Landfill”	Ensure that the definition used for landfill is consistent with the definition in WAC 173-303-040.			
9.	Page 1-16, line 8	The text states, “There are no indications that the landfills in the 200-SW-2 OU have impacted groundwater.” This statement is premature and lacks support. As noted in Chapter 3, groundwater monitoring for the Low	Remove this statement from the text.			

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		Level Waste Management Areas indicates exceedance of statistical parameters in several cases. At this point, the reason for these exceedances has not been determined. This RI will help to determine whether the SW-2 units have contributed to groundwater contamination. Furthermore, many of the LLWMA's lack sufficient monitoring networks to make statistical comparisons.				
10.	1-16; lines 11 to 15	<p>Conflicting statements in lines 11 through 15. Line 11 states "There are no indications that the landfills in the 200-SW-2 OU have impacted groundwater."</p> <p>Lines 13-15 state "The RI/FS work plan will focus on determining whether highly mobile contaminants or other contaminants with a potential to reach groundwater have migrated into the vadose zone beneath the buried waste."</p>	Provide clarification to the conflicting statements.			
11.	Page 2-4, line 28 and else where	<p>"Reportedly, no bulk liquids or free liquids...."</p> <p>Disagree, free liquids were allowed into the burial grounds until the Waste Acceptance Criteria required absorbent in 1970. However, "sloshers" that were buried as late as the late 1980s have been found during retrieval operations. Often paints, laboratory reagents, laboratory sample solutions, etc. were disposed of.</p>	Strike "or free liquids" from sentence.			
12.	Sections 2.1.2 and 2.1.3, Section 3.6.3, Appendix E, Sections 4.2	Several burial grounds were established on various past practice waste sites including ash-pits, ditches, and ponds. However, the mention of, history, and level of detail provided for these past practice waste sites are not consistent.	Provide additional information to the burial ground descriptions in these sections, similar to the description provided for the 216-C-9 Pond associated with the 218-C-8 Burial Ground. Also, carry this			

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	and 4.3.1.2 and Appendix A.		information forward to impacts on the Conceptual Models in Section 3 and Appendix E and the potential impacts during Phase I-A and I-B characterization (e.g. ash may impact the clarity of GRR data).			
13.	Page 2-6, Section 2.1.2.2	This section does not mention the water inflow that occurred within the 218-E-12A and 218-E-12B burial grounds during the mid-1980's (see document SD-WM-TI-260, "Water Inflow Investigation at the 218-E-12A and 218-E-12B Burial Grounds"). This information provides important historical information on flooding, contamination, and geology.	Please include this information in the text and update the conceptual site models for the 218-E-12A and 218-E-12B burial grounds accordingly.			
14.	Page 2-11, line 34	"Despite the volume of water observed during the flood, there has been no impact on groundwater....." Sampling has not been conducted to support or refute this statement.	Strike this statement.			
15.	Page 2-11, line 41 and else where	"...including opportunistic sampling, as appropriate."	Define "as appropriate". Provide information regarding how and when sampling by the SW-2 Project will be conducted during M-91 retrieval operations.			
16.	Page 2-13	Based on previous discussions during the DQO development in 2006, the 218-C-9 Burial Ground is the best documented burial ground. However, there is no in depth description of the SWITS data or mention of other supporting (D&D) documents for this site.	Add additional information.			
17.	Page 2-13 and Appendix A	For the 218-C-9 Burial Ground, no definitive basis for excluding passive gas monitoring in Phase I-B.	Provide a definitive basis or add passive soil gas monitoring for the 218-C-9 Burial Ground.			

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18.	Page 2-13, line 37	The text mentions "UPR-200-E-37" and "UPR-200-E-98". Previous information provided to Ecology (D&D-27257) indicates contaminated soil from "UN-216-E-37" and "UN-216-E-39".	Please check the numbers for these unplanned releases and clarify in the text.			
19.	Page 2-17, line 3 and Appendix A	"The location and number of trenches in this landfill are not known." GPR was completed for this site; however, additional surveys are needed to focus the intrusive sampling effort adequately.	Add additional GPR surveys to Phase I-B to better identify the location and number of trenches, or at least the location of burials made for this burial ground.			
20.	Page 2-17 and Appendix A	No passive gas monitoring is planned for the 218-E-9 Burial Ground and buried equipment came from the Uranium Recovery Process.	Provide a definitive basis or add passive soil gas monitoring for the 218-E-9 Burial Ground.			
21.	Page 2-18, Section 2.1.3.10	This section does not mention the water inflow that occurred within the 218-E-12A and 218-E-12B burial grounds during the mid-1980's (see document SD-WM-TI-260, "Water Inflow Investigation at the 218-E-12A and 218-E-12B Burial Grounds"). This information provides important historical information on flooding, contamination, and geology.	Please include this information in the text and update the conceptual site models for the 218-E-12A and 218-E-12B burial grounds accordingly.			
22.	Page 2-18, Section 2.1.3.11	This section does not indicate the "legacy contamination" (i.e. contaminated vegetation, feces, anthills, etc) historically present at the 218-E-12A burial ground as documented in a number of environmental reports (e.g. RL-PHMC-CENTPLAT-205-0013, "Legacy Contamination in Area 218-E-12A Burial Ground).	Please include this information in the text and update the conceptual site model for the 218-E-12A burial ground accordingly.			
23.	Page 2-22, line 20	"...6 to 8 vertical pipe units or dry wells." Incorrect, dry wells infer disposal of bulk liquids at the Hanford 200 Areas.	Strike "dry wells" and replace with "caissons".			
24.	Page 2-22	No passive gas monitoring is planned	Add passive soil gas monitoring			

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		for the 218-W-4A Burial Ground and buried waste came from the PFP Complex, specifically RECUPLEX.	for the 218-W-4A Burial Ground.			
25.	Page 2-36, line 21	The text states, "There is no evidence to suggest that the LLWMA-3 landfills have contributed to the regional groundwater-contaminant plumes." At this time, there is also insufficient evidence to eliminate the landfills as a contributing source to groundwater contamination. The monitoring network is deficient resulting in the suspension of statistical comparisons.	Eliminate this sentence from the text.	Page 2-36, line 21		
26.	Page 2-42, line 20	The text states, "There is no evidence to suggest that the LLWMA-2 landfills have contributed to the groundwater-contaminant plumes." At this time, there is also insufficient evidence to eliminate the landfills as a contributing source to groundwater contamination. Specific conductance has been increasing in these wells for several years and the monitoring network is deficient.	Eliminate this sentence from the text.	Page 2-42, line 20		
27.	Page 2-44, line 2	The text states, "There is no evidence to suggest that the LLWMA-2 landfills have contributed to the groundwater-contaminant plumes." At this time, there is also insufficient evidence to eliminate the landfills as a contributing source to groundwater contamination. Specific conductance has been increasing in these wells for several years and the monitoring network is deficient.	Eliminate this sentence from the text.	Page 2-44, line 2		
28.	Page 2-46, line 7	The text states, "Only the "rejected" sites do not require further documentation." It is not clear why "no action" sites would require further documentation, but "rejected" sites	Consult the TPA-MP-14 process for guidance and accordingly correct or clarify the text.	Page 2-46, line 7		

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		would not. Under the TPA-MP-14 process, a site is reclassified as "no action" if quantitative data exist to support a reclassification. A site is reclassified as "rejected" if qualitative information (i.e. historical) exists to support a reclassification. If a site is classified as either "no-action" or "rejected" it was an "accepted" waste site and therefore both would appear to require further documentation.				
29.	Page 2-46, Section 2.2.4.1 and Figure 2-14	Several 200 Area Processes and Operations were excluded from this discussion.	Add additional information for Sr/Cs Recover, Scavenging, URP, X-Plant Complex processes, D&D and tank farm operations.			
30.	Figure 2-14	The U-Plant Bar incorrectly identifies BiPO4/UO3.	Modify the U-Plant Bar to read URP/UO3.			
31.	Section 2.2.6, Page 2-53, lines 19-21.	The portion of the sentence stating "while LLW continued to be disposed of in unlined burial trenches" is unclear. It is not understood if LLW continued to be disposed of in unlined portions of TSD-unit landfills or if the words mean that LLW continued to be disposed of in non-TSD-unit landfills.	Please clarify.			
32.	Page 2-53, Table 2-1	No packaging practices are listed for years pre 1967 and post 1987.	Provide this information.			
33.	Page 2-53 thru page 2-68	Several errors and discrepancies exist regarding disposal practices, scope, schedule, task, activities, interpretation of SWITS data, and outdated information, etc. associated with the M-91 Project.	Route these sections for review and modification to M-91 Project personnel and USDOE counter part.			
34.	Page 2-57, line 37	"This waste did not contain TRU radionuclide and" Incorrect statement. Remote handled TRU wastes that have high levels of	Delete this statement.			

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		beta and gamma radiation does exist within the burial grounds.				
35.	Section 2.2.5.2, Page 2-50, 2 nd paragraph.	The text needs to describe and differentiate between "pre-1970 suspect TRU waste" and "post-1970 suspect TRU waste". Also, it is recommended that definition of TRU waste in the glossary (page xxvi) include the two terms in context to TRU waste management practices at Hanford.				
36.	Section 2.2.5.2, Page 2-53, 1 st paragraph, lines 5-7.	The paragraph is silent on whether the retrieved wastes were accurately described and/or designated. If this information is available, it is requested that it be added.				
37.	Section 2.2.6.4.2, Page 2-60, lines 7-17.	The section uses the term "class B poison". However, the glossary (page xxv) does not include a definition.	Please include a definition for the term.			
38.	Section 2.2.11, Page 2-68, lines 3-4.	The sentence states: "No landfill trenches currently are operating within the scope of the 200-SW-1 and 200-SW-2 OU landfills." In context of RCRA, the word "operating" is problematic. The TSD-unit landfills may be described to be "active", "operating", "storing", etc.	It is recommended that the text describe certain landfills in the operable unit as not currently accepting wastes. Alternatively, the TSD-unit landfills (all trenches) may be described as being "active", "where storage is currently conducted", etc.			
39.	Section 2.2.11, Page 2-68, line 12.	In relation to trenches 31 and 34, the sentence states: "Permitted treatment activities in these two trenches are being considered." As the Part A permit for the LLWMAs defines the units (i.e., boundaries, etc.), "permitted activities" (which includes storage, closure, corrective actions, etc.) are being considered for the entire LLWMA units.	The sentence should be re-written to clarify Ecology's intent to permit the entire units.			

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40.	Section 2.2.11, Page 2-68, lines 20-22.	The sentence states: "Trench 94 is part of a TSD unit landfill and is out of the scope of this RI/FS work plan, because the trench will be used beyond the timeframe (2024) that the Tri-Party Agreement specifies for remediation of the 200-SW-2 OU." The word "used" is problematic as all trenches in the 200-SW-2 OU, if not remediated, will be "used" for storage or disposal.	It is recommended that the words "continue to accept waste" be used en lieu of "be used".			
41.	3-1, lines 26, 28, 31	Missing document titles	Provide document titles			
42.	Page 3-3, Section 3.1.2, last paragraph.	The last paragraph describes landfill maintenance requirements, operations, and practices. Inspection records indicate that prior to landfill cover, containers were exposed to the elements for time periods allowing container and labeling/marketing degradation. In addition, after a snow event last year, LLBG containers were noted to be sitting in standing snow melt. The paragraph's description of landfill maintenance, requirements, operations, and practices doesn't provide a description that allows the reader to understand the full range of maintenance issues, operations, and practices.	Include additional description of landfill maintenance and operations practices that provides the reader an understanding of full range of operations and practices.			
43.	Page 3-13, Lines 15-18.	The text identifies the basis of binning as: "current knowledge and similarity of waste types, locations, and burial configurations." It is noted that the collaborative workshop agreement (March 30, 2005) numbers 2 and 3 identify 4 categories and high stakeholder interest in Bin 3B. From the text, it is unclear if the binning has been changed.	Include sufficient description of collaborative workshop agreement and Phase IB workplan binning approach to allow reader to understand if the binning approach has been changed. If the binning approach has been changed from that which was agreed to during the collaborative workshops, include the basis			

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			for the change.			
44.	Page 3-13, Line 19 and page 3-14, Lines 3 and 4.	On page 3-13, it is indicated that the binning approach provides the basis for remedial investigations. On page 3-14, it is indicated that the binning/grouping is for remediation.	The document should consistently identify the binning approaches used to support characterization and remedial investigation.			
45.	Page 3-14, line 1	The text states, "The DQO process for the 200-SW-2 OU established a binning procedure to group the sites into categories for remediation, based on the current state of knowledge for these sites." This text implies the same remedy for sites within a bin. However, these sites were binned based on historical information that remains to be verified during the RI.	Change text, "The DQO process for the 200-SW-2 OU established a binning procedure to group the sites into categories for <u>remediation characterization</u> , based on the current state of knowledge for these sites."			
46.	Page 3-15, lines 15 to 17	"These are sites for...but some questions remain." This statement is confusing as not all burial grounds listed contain unused portions.	Strike this statement.			
47.	Page 3-17, line 5	The text discusses four burial grounds that experienced flooding events. It is unclear which burial grounds are included in this category.	Add text to indicate the four burial grounds that experienced flooding.			
48.	Page 3-17, line 34	The text states that of the anions analyzed by this study, the maximum concentration detected in soil samples was 130 mg/kg for sulfate. The text also states, "All other anions either were not detected or were detected at values below 130 mg/kg." This statement is not meaningful as the soil concentration for protection of groundwater (soil clean-up level) is much lower than 130 mg/kg for several anions (e.g. nitrate, fluoride).	Clarify this information in the text.			

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49.	Page 3-42, lines 26-27	Text is out of date.	Please revise to reflect as follows: "Notice of Deficiency workshops have commenced and all Notice of Deficiencies have been closed."			
50.	Page 3.-43, line 31	The text states, "The exceedances are related to a regional nitrate plume and not LLWMA-1." This statement lacks basis. This RI remains to determine whether the burial grounds have contributed to groundwater contamination.	Remove this statement from the text.			
51.	Page 3-49, line 16	The text states, "RCRA monitoring provides no evidence that LLWMA-4 has contaminated the groundwater." This statement lacks basis. This RI remains to determine whether the burial grounds have contributed to groundwater contamination.	Remove this statement from the text.			
52.	Page 3-49, Section 3.5.5.3.	Health & Physics technicians collect data from "exhaling" groundwater monitoring wells after barometric pressure changes. It is recommended that this data be obtained and described in the workplan in relation to CCl4 and LLWMAs 3 and 4.				
53.	Page 3-53, line 20	This section indicates that COPC's for phase II are currently under development. It is unclear why these are being developed at this point, since COPC development occurred collaboratively during Ecology's participation in the DQO effort.	Please provide clarity on this issue.			
54.	Page 3-53, Section 3.6.2	The COPCs/COCs have been developed.	Strike "is currently under development" and replace with "was developed during the Phase II DQO process in 2006..."			

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			Also, add after the last bullet, "However, it is feasible to utilize a method based approach. This approach was also used for Tank Farm investigation efforts."			
55.	Page 3-54, Table 3-6	The text in the table states that the COPCs include gamma-emitting radionuclides that may be detected by rad surveys from within the caissons. The list of COPC's does not appear to include radionuclides that may be detected via the proposed borehole geophysical methods (spectral gamma, passive-neutron).	Please include a comprehensive list of COPC's detectable by spectral-gamma and passive-neutron geophysical methods.			
56.	Page 3-55, line 5	This sentence infers significant difficulty to excavate and treat portions of the burial grounds. These comments should be reserved for the FS once the data has been collected and reported.	Strike the first sentence or add "However, leaving highly contaminated wastes could prove significant risks to future generations, even with land restrictions and barriers.			
57.	Page 3-56, line 31	Regarding the development of the CSM's, the text states that "Identification and prioritization of these primary Hanford Site features, events, and processes (FEPs) was generated through a series of meetings held with representatives of the DQO team and other technical experts." Ecology cannot adequately review the CSM's and work plan without understanding the rationale behind the prioritization and analysis of the FEPs.	Please provide this rationale within the text or provide the document that contains the rationale.			
58.	Page 3-56, line 37	"Based on a consensus of professional judgments"... What were the bases of the judgments, who made the determinations and how was this effort documented.	Ecology did not participate in this conceptual site model development process. Provide the data, bases, judgments, documentation, etc. for this effort for review.			

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59.	Section 4.0	<p>Ecology is currently developing the WAC 173-303-840(2)(f) statement of basis to permit NRDWL. The statement of basis "will briefly set forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit." One of those principal facts is the results of the limited scope soil gas survey completed at NRDWL in 1997. That survey identified high concentrations of carbon tetrachloride and chloroform. DOE did not refute the need to collect additional data. Rather, in 1998 DOE deferred collection of additional data at that time, citing higher priorities at other 200 Area waste sites. Ecology anticipates that the draft permit conditions for the NRDWL will include a requirement to complete the soil gas survey at NRDWL that DOE deferred from 1998. Therefore, DOE should add the necessary soil gas survey to the scope of this RI/FS work plan.</p>	<p>Include a discussion in Section 4.0 regarding the sampling needs for NRDWL (i.e. soil gas survey).</p>			
60. 2 0	Page 4-1, Lines 30-31	<p>The text states that an objective for the 200-SW-2 OU DQO process incorporated into the RI/FS work plan approach includes the following.</p> <p>"Develop preliminary conceptual site models that reflect the physical characteristics of the landfills and the anticipated distribution of contaminants known to date...."</p> <p>The conceptual site models (CSMs) should not only reflect the contaminants known to date. The CSMs should employ a method-based analytical approach that will enable the</p>	<p>Please correct the text to read as follows:</p> <p>"Develop preliminary conceptual site models that reflect the physical characteristics of the landfills and the anticipated distribution of contaminants known to date...."</p>			

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		determination of known contaminants as well as additional contaminants that may not be in the historical site records.				
61.	Page 4-1, line 19	The text states, "Key decision makers from DOE, Ecology, and EPA participated in the... Phase I-B DQO summary report." This is inaccurate. Ecology did not participate in the Phase I-B DQO. Ecology's participation was for the intrusive phase, Phase II.	Clarify in the text.			
62.	Page 4-1	No data was captured from the Phase II DQO process that occurred in 2006.	Add this information or a placeholder for it.			
63.	Page 4-2, line 1	The text indicates that the reason for binning waste sites was for characterization and remedial-action decisions. This text implies the same remedy for sites within a bin. However, these sites were binned based on historical information that remains to be verified during the RI.	Please remove text that indicates that binning supports remediation.			
64.	Page 4-2	There is no mention of the PSQs or DQOs for the Phase I-A or I-B investigation.	Add this information.			
65.	Page 4-2, line 18	The text indicates that the results of the non-intrusive investigation will determine the "need for, and extent of, further intrusive investigation". This statement fails to acknowledge the limitations of the methods used for the non-intrusive investigation. The non-intrusive investigation largely provides qualitative information only and should not be used as a basis to eliminate intrusive characterization. Intrusive characterization will be necessary to verify the results of the non-intrusive surveys. The only case that might be made for eliminating intrusive	Change text, "The results... will provide a basis for determining the need for, and extent of, further focus of intrusive investigation."			

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		investigation based on the non-intrusive investigation is very good historical information indicating that a trench is unused, supported by high-quality surface geophysical evidence.				
66.	Page 4-3, Lines 19-20	<p>The text states the following:</p> <p>"The 200-SW-2 OU landfills may contain many different radioactive and hazardous chemical constituents; therefore, it is important to screen COPCs for risk assessments"</p> <p>This statement is inaccurate. Contaminants of potential concern are not screened for risk assessments. Instead, COPCs are screened during the risk assessment process. Therefore, testing should be done for all possible contaminants, and when the data enters the risk assessment process, specific contaminants may be screened out from further consideration based on a variety of criteria.</p>	<p>Please correct the text to read as follows:</p> <p>"The 200-SW-2 OU landfills may contain many different radioactive and hazardous chemical constituents.; therefore, it is important to screen COPCs for risk assessments-Specific COPCs may be screened during the risk assessment process."</p>			
67.	Pages 4-3, and 4-5	The logic that primary COPCs will be identified, a subset chosen and further screening before any risk assessments are completed is not appropriate and limits the type of data that will be collected in Phase II.	Remove this logic from the bullets listed and strike the paragraph that begins on line 9.			
68.	Page 4-3	It is not clearly defined how the data collected in Phase I-A and I-B will be utilized to focus the efforts for Phase II investigation efforts.	Add more information to resolve.			
69.	Page 4-4	No basis is provided to determine the "adequate number of survey points...to ensure that the site is characterized sufficiently to support a basis for decisions (relating to Phase II	Provide this basis.			

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		investigations).				
70.	Page 4-4, line 29	The text states that the results of the non-intrusive investigation will be used to "refine current information associated with the nature and extent of radiological and non-radiological contamination, support an initial evaluation of potential human-health risks, assist in the evaluation and selection of a remedial alternative(s), and help focus future intrusive site-investigation activities during the subsequent phase". Due to the limitations of the non-intrusive survey equipment, even a preliminary evaluation of the potential human health risks will be difficult after Phase I-B. Similarly, the non-intrusive investigation results should not be used to narrow down the selection of remedial alternatives, with very limited exceptions.	Change text, "These data will be used refine current information associated with the nature and extent of radiological and non-radiological contamination support an initial evaluation of potential human-health risks, assist in the evaluation and selection of a remedial alternative(s), and help focus future intrusive site-investigation activities during the subsequent phase".			
71.	Page 4-4, line 38	The list of the intrusive investigations in the text includes a variety of geophysical techniques, but does not include soil sampling, which may be achieved using direct push technologies or through test pitting.	Add soil sampling to the list of activities for the intrusive investigation.			
72.	Page 4-5, line 34	Editorial: The word "couples" is incorrectly used in the sentence.	Replace the word "couples" with "coupled".			
73.	Page 4-6, line 8	Since the summary report for the DQO is not attached as an appendix, it is unclear what ARARs and PRGs were developed for this effort. Ecology cannot move forward without evaluating this information.	Consider adding the DQO summary report as an appendix to this document, or include the ARARs and PRGs in the text with an explanation of how they were developed.			
74. 2 1	Page 4-6, Lines 35-37	The text states the following:	Please correct the text as follows:			

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		<p>"Because radioactive contamination survey and other field-screening results at the 200-SW-2 OU landfills will provide a significant amount of onsite data, the number of samples needed for laboratory analysis can be reduced."</p> <p>This is not necessarily accurate. The non-radioactive field screening may not reduce the number of samples needed for laboratory analysis due to the limitations of the field screening devices. The detection limits of the field screening methods are often very high, and therefore the field data can not be used to eliminate further laboratory analysis of contaminants.</p>	<p>"Because rRadioactive contamination survey and other field-screening results at the 200-SW-2 OU landfills <u>will are anticipated</u> to provide a significant amount of onsite data. <u>Based on this</u>, the number of samples needed for <u>radiochemical laboratory analysis can may</u> be reduced. <u>Field screening data for nonradionuclide chemicals may not be able to be used to eliminate further laboratory analysis due to the inherent limitations of the field screening methods.</u>"</p>			
75.	Page 4-7 and Appendix A	No GPR planned for the 218-W-3AE Burial Ground.	Provide a definitive basis or add GPR for the 218-W-3AE Burial Ground for Phase I-B.			
76.	Page 4-9 and Appendix A	No GPR or passive soil gas monitoring planned for the 218-E-10 Burial Ground.	Provide a definitive basis or add passive soil gas monitoring and GPR for the 218-E-10 Burial Ground for Phase I-B.			
77.	Page 4-9 and Appendix A	No GPR or passive soil gas monitoring planned for the 218-E-12B Burial Ground.	Provide a definitive basis or add passive soil gas monitoring and GPR for the 218-E-12B Burial Ground for Phase I-B.			
78.	Page 4-7, line 4	The text discusses the use of biased sampling for Phase I-B and states that "using this approach, sampling locations can be selected that increase the chance of encountering worst case areas of contamination." This may be true when reliable historical and physical knowledge exist about a site. It is not true for many of the sites in SW-	Include a discussion of the limitations of biased sampling in the text.			

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		2. Furthermore, biased sampling does not allow for any extrapolation of data to points other than the sampling point or for any estimate of confidence.				
79.	2 Page 4-7, 2 lines 16-17	<p>The text states the following:</p> <p>“This section provides an overview of the phased characterization approach planned to meet the data needs for the 200-SW-2 OU landfills, as determined during the DQO process.”</p> <p>The correct phase of the DQO needs to be specified.</p>	<p>Please correct the text as follows:</p> <p>“This section provides an overview of the phased characterization approach planned to meet the data needs for the 200-SW-2 OU landfills, as determined during the <u>Phase I-B DQO</u> process.”</p>			
80.	Page 4-7, lines 24-28	<p>The text states the following:</p> <p>“Results from these studies will be used to provide a basis for the next steps in the characterization (e.g., determination of locations requiring special attention, whether additional field screening or surveys are required, and/or whether samples should be collected). Additional characterization needs will be defined on a site-specific basis.”</p> <p>The text fails to state that the additional characterization needs have been discussed and outlined in the Phase II DQO, which was attended by Ecology, DOE and Fluor from October 2006 to February 2007.</p>	<p>Please correct the text as follows:</p> <p>“...Additional characterization needs will be defined on a site-specific basis. <u>However, the direction of how to obtain the intrusive characterization has been outlined in the Phase II DQO summary report (reference document).</u></p> <p>Insert the Phase II DQO Summary Report document.</p>			
81.	Page 4-8, lines 30-31	<p>The text states the following:</p> <p>“Phase II and III activities will be conducted under a separate DQO and a revision to this R/FS work plan and</p>	<p>Please correct the text as follows:</p> <p>“Phase II and III activities will be conducted under a separate</p>			

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		<p>SAP.”</p> <p>This statement needs to acknowledge that the basis for the Phase II DQO has been completed. And that the information obtained from the Phase I-B work plan will be used to focus the locations of the intrusive characterization, which was defined in the previously started Phase II DQO process.</p>	<p>DQO and a revision to this RI/FS work plan and SAP. <u>The information obtained from the Phase I-B work plan will be used to focus the locations of the intrusive characterization. However, the fundamental needs for intrusive characterization of the 200-SW-2 landfills were already identified in the Phase II DQO process which was developed in 2006. These objectives may be further defined in the follow-up Phase II DQO, which is expected to occur in 2009.”</u></p>			
82.	Pages 4-9-4-10; lines 40-2	<p>The text states the following under the “Visual Inspection” bullet:</p> <p>“After field surveys are completed, and if determined to be free of buried waste, these areas of unused landfills may be administratively reclassified in the WIDS database, and permit changes will be initiated.”</p> <p>The text does not state what the sites would be reclassified to. Assumedly, the intent of Fluor and DOE would be to reclassify them as “No Action”. If this is the intent, confirmatory sampling will still need to be done in order to reclassify these sites to “No Action”, even if the field surveys determine the landfills to be free of buried waste.</p>	<p>Please include within the text what specific WIDS classification is being referred to (i.e.; No Action, rejected, Interim closed Out, etc.) Also, state that confirmatory sampling will be required in order to complete the WIDS reclassification process.</p>			
83.	Page 4-11, lines 29-30	<p>The text states the following:</p> <p>“The data (passive soil-vapor) can</p>	<p>Pleased edit the text as follows:</p> <p>“The data (passive soil-vapor)</p>			

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		<p>provide information that can be used to focus intrusive sampling and provide a list of expected volatile organic compounds."</p> <p>It is important to state that when it is time to conduct the intrusive characterization for volatile organic compounds, the COPC list will not be limited to the list of expected contaminants, which have resulted from the passive soil-vapor sampling. This is because the passive soil-vapor method is only capable of testing a limited amount of contaminants, and detection limit issues may also inhibit the usability of the data.</p>	<p>can provide information that can be used to focus intrusive sampling and provide a list of expected volatile organic compounds. <u>However, the list of VOCs to be intrusively investigated will not be limited to the list of expected VOCs, which resulted from the passive soil-vapor sampling. Intrusive characterization of VOCs will be analyzed per SW-846 Method 8260, and TICs (tentatively identified compounds) will be report per the guidance in the HASQARD (Hanford Analytical Services Quality Assurance Required Document."</u></p>			
84.	Page 5-5 and associated text	<p>There are several statements made in Table 5-1 and associated text that are not key regulatory and Tri-Party Agreements including:</p> <ul style="list-style-type: none"> -The closure standards for landfills do not require or address removal of wastes or soils. -The closure standard for landfills does not include removal or decontamination. - Sampling and analysis for the TSD-unit landfill closure should be for purposes of the cover. <p>The way the table is worded, it is implied that these closure activities are not required.</p>	<p>RCRA Corrective Action may apply during operation and maintenance of these sites including removal of wastes or soils.</p> <p>Revise section 5.0 to include a discussion of the TSD units with respect to the Past Practice Units. Specifically, Section 5.5 of the TPA states that those TSD units that are closely associated with the past practice units may be coordinated into the past-practice investigation (this Work Plan) to avoid overlap.</p> <p>TSD Closures per the TPA Action Plan require that a SAP be prepared and that the Work Plan outline how the</p>			

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			closure/postclosure plan requirements will be met.			
85.	Page 5-5; Table 5-1	Table is confusing. All TSD Units are required to be closed in accordance with WAC 173-303-610 (see TPA Action Plan, Section 5.3). Additionally, the unlined trenches do not meet the requirement for a landfill closure under 173-303-665, as no liner has been installed into the unlined trenches.	Suggest deleting Table 5-1 and replacing with a TSD closure cross-walk.			
86.	Section 5.0	General Comment: Ensure that Section 5 is consistent with the approach and guidance provided in DOE/RL-98-28 and the TPA Action Plan. The Work Plan confuses the application of Corrective Action, as well as closure under 173-303-665, and - 610.	Revise section 5.0 for clarity and consistency with the requirements of the TPA, DOE/RL-98-28; and the WAC.			
87.	Page 6-2, Figure 6-1, ID 9: DQO Phase I-B (Collaborative)	The figure indicates that the DQO Phase I-B (Collaborative) process has a start date of 10/1/2007, and a finish date of 12/31/2007. If this is accurate, it means that the Phase I-B DQO process would be occurring at this present time. Ecology is not currently participating in the Phase I-B Collaborative DQO, and therefore the process is not collaborative; if it is indeed occurring. Furthermore, it is not understood as to how the Phase I-B DQO could still be underway, if in fact this document (DOE/RL-2004-60) has been prepared as a result of the Phase I-B DQO	Provide the accurate dates for the DQO Phase I-B process. Also, see comment #7 to ensure completeness—need to define how Phase 1B was developed.			

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		process. Also, based on previous statements in this document, SGW-33252 is the summary report for the Phase I-B DQO. If the summary report is already prepared, then the DQO process dates of 10/1/2007 to 12/31/2007 are not possible.				
88.	Page 6-2, Figure 6-1, ID 10: DQO Phase II	The figure indicates that the DQO Phase II process has a start date of 1/1/2009, and a finish date of 6/30/2009. It is important to acknowledge that this Phase II DQO will be a follow-up to the Phase II DQO process that already occurred from October 2006 to February 2007. A tremendous amount of work was done by the participants of the first Phase II DQO, and the information that was accumulated and agreements that were made need to be documented, and carried forward to the upcoming Phase II DQO, along with the data that will be obtained from the Phase I-B DQO guided work. Phase I-B data should enable the next Phase II DQO to be more focused, however, the fundamental requirements that were stated in the first Phase II DQO should be maintained.	Add a footnote that states the 1/1/2009 to 6/30/2009 Phase II DQO will be a follow-up to the Phase II DQO process that already occurred from October 2006 to February 2007. Reference the document that includes a comprehensive account of what occurred in the previous Phase II DQO (i.e., accumulated information and agreements that were made).			
89.	Page 7-17	Several documents are needed to complete the review of this document including: -SGW-33253 -SGW-34462 -SGW-34463 -SGW-35016	Provide these documents to Ecology to complete review of the Draft B Work Plan.			
90.	Appendix A, General	It is difficult to discern the locations of the direct pushes and soil gas samples with only coordinates given. The	Please include the locations of the soil gas samples and direct pushes on the figures in			

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		figures in Appendix B show only the locations of existing wells, but do not indicate the locations of the soil gas samples or direct pushes.	Appendix B.			
91.	Appendix A	No passive gas monitoring is planned for the 218-E-4 Burial Ground.	Provide a definitive basis or add passive soil gas monitoring for the 218-E-4 Burial Ground.			
92.	Appendix A; A3.1.2	Page 4-8, lines 8 through 13 describe the use of GPR and radiological surveys prior to any intrusive work. The SAP does not mention the use of GPR or rad surveys.	Please include a discussion of the use of GPR and rad surveys to the Intrusive Data Collection techniques.			
93.	New Comments: 1/30/2008					
94.	General	<p>Focused/biased sampling designs are only recommended when reliable physical and historical information are known about a site. Area-wide sampling is recommended when the spatial distribution of contaminants over the study area is uncertain (see Ecology Guidance on Sampling and Data Analysis Methods, Publication No. 94-49).</p> <p>Surface geophysical surveys and topographical surveys provide continuous data and are relatively inexpensive. Soil vapor surveys also provide a relatively inexpensive way to sample local areas and provide data from a larger area than with soil sampling. Borehole geophysical logging of existing wells and direct push holes will provide useful data, but will only provide information from a small (<1 ft) radius around the detector. If a focused sample design will be employed for future phases, it is</p>	<ol style="list-style-type: none"> 1) Expand scope to include surface geophysical surveys of all burial grounds, including the TSDs. 2) Expand the scope of the soil vapor sampling to include widespread coverage of all trenches. 3) Conduct surface topographic surveys of all burial grounds (e.g. drive transects with Real Time Kinematic GPS) to identify potential locations for ponding of water. 4) Add direct push locations for a more systematic approach (see specific comment). <p>See general comments</p>			

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		necessary to have information by which to focus sampling; therefore, full advantage should be taken of inexpensive survey methods such as soil vapor, topographic, and surface geophysical methods. For the borehole geophysical methods to provide locations of focus, they must be applied at many more locations.	below for further justification.			
95.	General	At the conclusion of the Phase IB non-intrusive sampling events, please conduct a workshop to discuss/present results.	Add a commitment to Section 1.0 of the Work Plan.			
96.	General and Page 3-18, Section 3.3.1	"200-SW-1 OU..." No data is presented in Appendix D, no sampling in Appendix A, no influences of parameters of the Conceptual Site Models (CSMs), no CSMs, etc.	It is evident that the 200-SW-1 and 200-SW-2 are on different RI/FS paths. Either completely incorporate all 200-SW-1 data and information into this RI/FS work plan and future revisions; or remove all 200-SW-1 OU information from this RI/FS Workplan and complete a TPA Change Package to split the 200-SW-1 and 200-SW-2 RI/FS documentation. Should DOE keep these Operable Units together, revise Work Plan to include non-intrusive sampling (e.g. GPR) for NRDWL and 600 CL.			
97.	General	The technical basis (i.e. metallic anomalies) for the locations of the soil vapor sampling is unclear. Due to acknowledged shortages of containers, it is likely that containers made from less durable, non-metallic materials were also used to dispose of packages	Expand the scope of the soil vapor sampling to include widespread coverage of all the trenches.			

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		containing liquids. The burial grounds also likely contain significant areas of metallic debris that are not associated with liquids. When available, historical information should be used to support sampling locations. Several landfills that are not receiving vapor surveys have "potential organic waste" identified as an Ecology Item of Interest (e.g. 218-E-12B). The passive gas surveys should be viewed as a relatively inexpensive way to collect data compared with the alternative (i.e. soil sampling).				
98.	General	Surface geophysical surveys should be performed for all the landfills, including the TSDs. These surveys represent the only continuous data set that can be collected, and will support the basis for focusing sampling in future phases.	Add surface geophysical surveys for all Bin 1 landfills (TSDs).			
99.	General	As the text recognizes (pg. 4-7), direct push technologies can be used to collect samples with minimal waste generation. Since direct push technologies are being used for geophysical logging, it makes sense to obtain opportunistic soil samples in the process. Soil samples should be collected, unless technical justification can be provided. The text also recognizes that organic vapor monitoring can be performed via direct push. Opportunistic vapor sampling should be done at all push locations.	Include soil and vapor sampling via direct push at all locations where direct pushes will be performed.			
100.	General	Records research might indicate landfills that were affected by massive flooding events, but will not indicate ponding during normal rain or snow	Conduct high resolution surface topographic surveys of all burial grounds (e.g. drive transects with Real Time Kinematic GPS)			

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		<p>events. Topographical surveys should be conducted to identify areas that may have been subject to repeated infiltration during normal rain or snow events.</p> <p>Topographical surveys will be useful to focus sampling on these locations and to identify potential subsidence issues related to worker safety.</p>	<p>to identify potential locations for ponding of water.</p>			
101.	Work Plan Section 1 and 2	<p>According to the Signed Collaborative Agreement for the 200-SW-2 OU a Table "Key Assumptions" that were to be developed jointly by Ecology and USDOE should have been included in either Section 1 or 2 or the work plan. This Table was to list the assumptions that drive scope, schedule, and costs.</p> <p>Ecology understands that since the Signed Collaborative Agreement for the 200-SW-2 OU has been approved, the May 15, 2007 Path Forward agreement between Ecology and USDOE has also been signed noting that additional Phase I work will be needed before Phase II and Phase III sampling commences.</p>	<p>Provide information and a frame work in the Work Plan that will develop into working sessions to jointly develop these scope, schedule and cost assumptions, information, and Table once the Phase I efforts are completed.</p>			
102.	Work Plan Sections 4 and 5	<p>According to the Signed Collaborative Agreement for the 200-SW-2 OU Sections 4 and 5 were to contain information including (but not limited to): the development of logic for vadose zone soil sampling to confirm the CSMS; include all of the Phase I Non-intrusive data; identify data uses for treatability investigations; how data will be evaluated for likely response scenarios; incorporate M-91 investigation data and costs; etc.</p> <p>Ecology understands that since the Signed Collaborative Agreement for the</p>	<p>Provide information and a frame work in the Work Plan that will develop into working sessions to jointly develop the data listed in the "200-SW-1 and 200-SW-2 RI/FS Work Plan Agreements" Table (in the Collaborative Agreement) once the Phase I efforts are completed.</p>			

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		200-SW-2 OU has been approved, the May 15, 2007 Path Forward agreement between Ecology and USDOE has also been signed noting that additional Phase I work will be needed before Phase II and Phase III sampling commences.				
103.	Section 1.0, 4 1-1, 20	Recommended text: "Some OUs include RCRA treatment, storage, and/or disposal (TSD) units that will be operated, remediated, and/or closed in conjunction with OU activities."				
104.	Figures 1-2 and 1-3, Pages 1-3, and 1-4, respectively	Recommended key wording for yellow colored wastes: "Radioactive Waste & Potential Mixed Waste".				
105.	Figures 1-2 and 1-3, Pages 1-3 and 1-4, respectively	Recommended key wording for green colored wastes: "Mixed Waste".				
106.	Figure 1-4, 5 Page 1-5	The yellow color coding indicates "radioactive waste". Elsewhere, the text states otherwise.				
107.	Section 6 1.1.2, Page 1-7, Line 19.	It is recommended the words "are inactive" be deleted. Dangerous waste regulations (WAC 173-303-040) define "active life" and "active portion" in relation to RCRA TSDs. As such, the use of the word "inactive" is unclear and confusing. It is recommended the word not be used.	Suggest rewording: "Most of the 200 Area landfills are no longer receiving waste and are known as "inactive" in the WIDS database."			
108.	Section 1.1.2, Page 1-7, line 25.	The text describes four bins with four bullets but states: "A discussion of the six bins..." Typographical error.				
109.	Section 7 1.1.2, Page 1-8, Line 31.	The text states: "...for completion of the 200-SW-2 OU RI/FS process (including TSD closure/postclosure				

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		care), as well as..." From review of Section 6, the schedule does not appear to address/include TSD closure/postclosure care activities associated with 200-SW-2 OU. It is recommended that "(including TSD closure/postclosure care)" be deleted.				
110.	Section 1.2, Page 1-10, lines 1-3.	The text states: "The FS will use the existing and newly collected data to evaluate a range of remedial actions for the sites evaluated in the RI and for the remaining sites in the OUs that fall within the contaminant distribution model." The meaning of this sentence is unclear. Clarification of meaning (including description of process or reference of description of process) is requested.				
111.	Section 1.2.3, Page 1-11, between 2 nd and 3 rd paragraphs.	The section should include a description of Phase II DQO efforts which occurred during 2007. It is recommended that the description identify that due to the scope, the complexities of characterizing releases and potential releases, and the significant information needed to support development of conceptual models for the units, it was agreed that an additional characterization effort would occur as Phase I (i.e., Phase I-B).				
112.	Section 1.3.1.	The section needs to identify that non-intrusive characterization of trenches containing exempted waste may occur. The section does acknowledge the potential use of substrate sampling information obtained by another project during retrieval of exempted wastes. Likewise, the section should identify that non-intrusive characterization (i.e., geophysical surveys, topographical				

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		surveys, vapor monitoring, etc.) may be generated during Phase I-B and later used to support the RI/FS.				
113.	Section 1.5, Page 1-14, 2 nd bullet.	<p>The text states: "The contaminants in the 200-SW-2 OU are expected to be located within 3 to 10 m (10 to 33 ft) of the ground surface, and at or near the bottom of the disposal unit (trench)." At this time, it is unknown how routine precipitation infiltration affects contaminant transport. The assumption clearly identifies "flooded" conditions as an exception. However, at this time, it is unknown if routine precipitation infiltration conditions are an exception. Also, releases and transport of carbon tetrachloride (and decomposition products) have already been shown to be an exception to this assumption. It is recommended that this assumption either be deleted or significantly revised.</p> <p><i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds (DOE/RL-2000-72 Revision 0)</i> provides conceptual models for contaminant migration under operational and post-closure conditions as Figure 2.3. On page 2.8, the assessment states: "Infiltration and the drainage of moisture through the vadose zone beneath the burial grounds are expected to be much greater during operations than after closure. During the operational period, runoff can accumulate in depressions and open trenches. Although unlikely, under unfavorable conditions (e.g., unusual precipitation event), migration</p>	<p>It is recommended the first two sentences of the bullet be replaced with: "Contaminants in some of the 200-SW-2 OU units are expected to be located within 3 to 10 m (10 to 33 ft) of the ground surface, and at or near the bottom of the disposal unit (trench). However, due to certain conceptual site model variables, certain combinations of conceptual site model variables, and certain indications of contaminant transport available to-date, characterization is necessary to further develop conceptual site models."</p> <p>In addition, it is requested that the conceptual models of contaminant migration under operational and post-closure conditions be incorporated into this workplan (see DOE/RL-200-72, Rev. 0).</p>			

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		<p>to groundwater could occur in a relatively short time (estimated at 50 to 100 years in Wood et al. 1995, 1996). This is more likely in the 200 East Area burial grounds where the vadose zone is in the Hanford formation (course sands and gravel). If breatkthrough occurs during the operational period, it could indicate possible weak points in the waste management system that might need special attention for closure."</p> <p>On page 2.9, the text states: "Possible weak points noted include structural failures. For example, collapse of boxes and containers that have large void spaces could create depressions and openings for collection of snow melt. Such depressions and/or openings would result in enhanced infiltration that could shorten the travel time to groundwater considerably from the estimated rate of 50 to 100 years (based on a uniform infiltration rate of 5 cm/yr)."</p> <p>The below photos (taken on 12-27-06) represent conditions that represent examples of "possible weak points" associated with operational as well as "post-closure" conditions.</p>				

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114.	Section 1.5, Page 1-15, lines 3-7.	The text states: "Potential contamination originating from the 216-C-9 Pond is being examined under the 200-MG-1 OU. Potential contamination originating from the 216-T-4 Pond system (...) will be investigated by the				

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		<p>200-CW-1 and 200-MG-2 OUs". Considering the potential conceptual models associated with contaminant transport from these units, it is not understood how contamination from the burial ground can be differentiated from "potential contamination" from the ponds. It is requested that a description be included of how characterization of the burial grounds and ponds will be coordinated so that the stated assumption may be supported.</p>				
115.	Section 1.5, Page 1-15, lines 13-16.	<p>The text states: "Therefore, based on the land-use decision for the 200 Areas, potential impacts from the landfill contaminants within the 200 Areas would be to current and future site workers and to terrestrial biota using the sites." The text does not acknowledge the potential impact to groundwater quality. This impact could be significant and should be addressed.</p>				
116.	Section 1.5, Page 1-15, lines 19-23.	<p>The text states: "This RI/FS work plan will address likely response scenarios...." Given that response decisions will not be made in the near future and will be based on information not yet available, it is recommended that the sentence be re-written as: "The RI/FS work plan will ultimately address likely response scenarios...."</p>				
117.	Section 1.5, Page 1-16, lines 13-15.	<p>The text indicates that the work plan will focus on highly mobile contaminants or other contaminants with a potential to reach groundwater. It can be argued that all contaminants have "a potential to reach groundwater". Similar to the saying "the poison is the dose", it can be said that that "the impact is the driver". It is recommended that the</p>				

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		sentence be re-written as: "The RI/FS work plan will focus on determining whether contaminants have migrated into the vadose zone beneath the buried waste."				
118.	Section 1.5, Page 1-16, line 22.	The term "solid waste" is used. It is recommended that a definition of the term be added to the glossary.				
119.	Section 2.1.1, Page 2-1, line 35.	As the word "inactive" has no RCRA regulatory definition (and thus no meaning), it is recommended the word "inactive" not be used in context to RCRA TSD units. The use of this word is confusing and shouldn't be used in the workplan in context to RCRA TSD units.				
120.	Section 2.1.2, Page 2-4, line 34.	The RCRA TSD unit is described as consisting of seven "radioactive landfills and one unused landfill". It is recommended that the seven landfills be described as "mixed waste landfills". This term is consistent with RCRA terminology (definition provided by WAC 173-303-040), and the RCRA Part A for the unit.				
121.	Section 2.1.2.1, Page 2-5, lines 40-42.	It is recommended that the paragraph describe all surveillance activities associated with the unit. For example, routine RCRA inspections are performed and the text should identify this as an on-going operational function.				
122.	Section 2.1.2.2, Page 2-6.	It is recommended that the paragraph describe all surveillance activities associated with the unit (stabilized and non-stabilized portions). For example, routine RCRA inspections are performed and the text should identify this as an on-going operational function.				

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123.	Section 2.1.2.1, Page 2-6, lines 32-36.	Where possible throughout the work plan, it is recommended that occurrence reports be referenced by number. The text describes the removal of contaminated tumbleweeds for which an occurrence report was very likely generated.				
124.	Section 2.1.2.3, Page 2-7, lines 31-34.	The text describes a flood event. If an occurrence report was generated, it is requested that the report be referenced. Also, it is requested that the text identify which trenches (or portions of trenches) were covered by flood water. The trenches should be identified by number. If portions of trenches were covered, it is recommended that those portions flooded be described using survey coordinates or a drawing/figure. These flooded areas are important to describe as accurately as possible.				
125.	Section 2.1.2.4, Page 2-8, lines 30-32.	The text describes the discovery of contaminated tumbleweeds. If available, it is recommended that an occurrence report be referenced. Also, it is recommended that either a detailed description or drawing be included which depicts the 216-T-4B seepage pond area in relation to or within the 218-W-3AE landfill.				
126.	Section 2.1.2.5, Page 2-9, lines 20-21.	The text states: "No trenches in this landfill contain MLLW or TRUM that was disposed of after the effective date of mixed-waste regulation at the Hanford Site (August 19, 1987)". Either site the basis for the statement or delete it. The landfill is a RCRA TSD unit and the statement adds no value to the workplan.				
127.	Section 2.1.2.5,	The text describes a flood event. It is requested that the text identify which				

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	Page 2-10, lines 7-8.	trenches (or portions of trenches) were covered by flood water. The trenches should be identified by number. If portions of trenches were covered, it is recommended that those portions flooded be described using survey coordinates or a drawing/figure. These flooded areas are important to describe as accurately as possible.				
128.	Section 2.1.2.5, Page 2-10, lines 16-17.	It is recommended that the paragraph describe all surveillance activities associated with the unit (stabilized and non-stabilized portions). For example, routine RCRA inspections are performed and the text should identify this as an on-going operational function.				
129.	Section 2.1.2.5, Page 2-10, line 18.	The text describes a "fenced field". It is requested that more information be provided. In particular, if the fence prevents access by a lock, access prevention should be described. Also, if there are postings on the fence to prevent unauthorized personnel entry, it is requested that these be described/identified.				
130.	Section 2.1.2.6, Page 2-11, lines 29-35.	The text describes a flood event. It is requested that the text identify which trenches (or portions of trenches) were covered by flood water. The trenches should be identified by number. If portions of trenches were covered, it is recommended that those portions flooded be described using survey coordinates or a drawing/figure. These flooded areas are important to describe as accurately as possible.				
131.	Section 2.1.2.6, Page 2-11, lines 33-35.	The text states: "Despite the volume of water observed during the flood, there has been no impact on groundwater, as shown in the groundwater monitoring				

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		data presented in Section 3.4.4.4." Unless the groundwater monitoring program is adequate to reflect impact, the statement is unsubstantiated. Either identify that the statement of no impact is an interpretation of available groundwater monitoring data that Ecology cannot confirm (thus agree with), or delete the statement.				
132.	Section 2.1.2.6, Page 2-11, lines 35-36.	Provide references for the presence of perched water beneath the 218-W-4C landfill in 1991 and the absence of the perched water in 1994.				
133.	Section 2.1.2.7, Page 2-12, lines 30-31.	It is recommended that the paragraph describe all surveillance activities associated with the unit (stabilized and non-stabilized portions). For example, routine RCRA inspections are performed and the text should identify this as an on-going operational function.				
134.	Section 2.1.3.1, Page 2-13, lines 24-25.	The two sentences appear to be misplaced. Also, provide a waste volume for the 218-C-9 landfill.				
135.	Section 2.1.3.1, Page 2-13, 3 rd paragraph.	The landfill also contains ~100 drums which is not described.				
136.	Section 2.1.3.1, Page 2-13, 3 rd paragraph.	The text states: "If vadose-zone contamination exists, it likely will be as a result of pond operations over 3 decades." It is recommended that the following statement be added to the text: "Further complicating characterization of the landfill, the vadose zone moisture from pond operations could expedite transport of contaminants from the landfill."				

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137.	Section 2.1.3.1, Page 2-14, lines 5-8.	It is recommended that the text explain why fly ash is an effective medium to control plant intrusion and identify that it may be necessary to characterize the fly ash.				
138.	Section 2.1.3.4, Page 2-15, lines 20-21.	The text describes a sink hole. It is recommended that either a description of the location of the sink hole or a figure be included so that the sink hole may be located.				
139.	Section 2.1.3.9, Page 2-17, lines 34-35.	The text describes a sink hole. It is recommended that either a description of the location of the sink hole or a figure be included so that the sink hole may be located.				
140.	Section 2.1.3.12, Page 2-19, lines 23-25.	The text describes sink holes. It is recommended that either descriptions of the locations of the sink holes or a figure be included so that the sink holes may be located.				
141.	Section 2.1.3.13, Page 2-20, lines 16-17.	The text indicates that sink holes were filled. It is recommended that either descriptions of the locations of the sink holes or a figure be included so that the sink holes may be located.				
142.	Page 2-8, lines 27-29	The 216-T-4B (pond and 216-T-4-2 ditch are noted. However, no information is provided how this site will be investigated or remediated either with the 218-W-3AE or as part of the 200-CW-1 OU RI/FS efforts.	Provide this information.			
143.	Page 2-13, line 8	<p>"...it was moved to the 200-MG-1 OU..."</p> <p>Why was this site moved to a "No Action" OU rather than simply closed procedurally or rejected through the WIDS process as other sites are</p>	<p>"No Action" is not a regulatory term and is being strongly objected to by both EPA and Ecology. Suggest a TPA Change Package to move this site back into SW-2 and completing the approval for a WIDS rejection and then</p>			

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			procedurally closing this burial ground.			
144.	Page 2-17, line 3 and globally	<p>"Exact trench locations are not known..."</p> <p>Even though GPR was completed at this site, the work plan still indicates that the locations of the trenches are not known</p>	Additional field work needs to be completed for this and other burial grounds where locations of the trenches remain unknown. Characterization and remediation can not be planned if surveys and record reviews are not adequate in Phase I to make decisions for Phase II sampling and ultimately remediation.			
145.	Page 2-20, lines 34-35	<p>"...is contaminated soil from remediation of the 216-T-4 Ditch and Pond (Trench 27)....</p> <p>This statement is a bit confusing as the northern portion of the burial ground was the ditch and pond.</p>	Clarify the location of the ditch and pond and the location the contamination from the ditch and pond were placed. Do these records include soil samples to ensure contamination was completely removed? Is the sampling and analysis data of quality that no additional sampling of the buried soils is needed to plan a remedial action?			
146.	Section 2.1.3.15, Page 2-21, lines 23-24.	The text indicates that sink holes were noted during stabilization. It is recommended that either descriptions of the locations of the sink holes or a figure be included so that the sink holes may be located.				
147.	Section 2.2.3.1.	The section text provides information that should be supported with references. It is requested that references be included (eg, interim ROD, annual groundwater monitoring reports, remediation assessment reports, etc.).				

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148.	Section 2.2.3.2.	Four strontium-90 plumes exist in the 200 East Area and there are other contaminants of concern not acknowledged. It is recommended that the annual groundwater monitoring reports be used (and referenced) to describe 200 East groundwater contaminants.				
149.	Page 2-56, line 31	"...favorable hydrogeological conditions..."	Clarify what is meant by "favorable hydrogeological conditions".			
150.	Section 2.2.6.2 Pages 2-57 and 2-58	"Containment Barriers" This section describes the various types of containment barriers used at Hanford from 1968 to 1993. However, no references are provided and explanation is given to stipulate if the bullets describe standard practices, Hanford site requirements (supported by waste management procedures and applicable AEA regulations, etc.)	Provide references for the bulleted statements and describe how and why these requirements were instituted and to what level during field operations.			
151.	Section 2.2.6.3 Pages 2-58 and 2-59	"Filler Materials" This section describes the various types of filler materials used at Hanford from 1968 to 1993. However, no references are provided and explanation is given to stipulate if the bullets describe standard practices, Hanford site requirements (supported by waste management procedures and applicable AEA regulations, etc.)	Provide references for the bulleted statements and describe how and why these requirements were instituted and to what level during field operations.			
152.	All Sections in 2.6, page 2-59 to 2-61	All sections are missing references. These sections note waste compatibility issues and associated packaging of the waste. It is important to document the references used. Also, no occurrences as a result of packaging incompatible materials together in burial grounds such as fires,	Provide references for these sections. Add information regarding occurrences in burial grounds due to packaging and disposing of incompatible materials together, before proper segregation procedures were			

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		etc. have been included in this history.	employed.			
153.	Section 3.2.2, Page 3-14, lines 29-31.	The following portion of the statement is unsupported and should be deleted: "although there is no indication that solid-waste landfills have impacted the groundwater". This portion of the statement is premature and lacks support. As noted in Section 3, groundwater monitoring for the Low Level Waste Management Areas indicates exceedance of statistical parameters in several cases. At this point, the reason for these exceedances has not been determined. This RI will help to determine whether the SW-2 units have contributed to groundwater contamination. Furthermore, many of the SW-2 units lack sufficient monitoring networks to make statistical comparisons.				
154.	Section 3.3, Page 3-17, lines 17-18.	The text states: "Most of the more recent well installations were for monitoring conditions beneath tank farms, not landfills." It is recommended that the text include an acknowledgement of Milestone M-24 and the identification of well needs associated with LLWMAs 1-4.				
155.	Table 3-1, pages 3-4 to 3-7	The SW-1 OU and the SW-2 OU sites are listed together.	To clarify this table and the change in OUs, split the table into two tables (one for original SW-1 OU sites and one for original SW-2 OU sites).			
156.	Page 3-7line 12 and Table 3-2 and page 3-13, lines 10-14, and	"...have migrated..." Waste site do not migrate.	Change text and table heading to reflect that the waste sites "were transferred" from one OU to the other. Also, list the TPA Change Form Packages that accomplished the transfer of			

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	page 3-15, line 2		these sites (e.g. C-07-X).			
157.	Table 3-3. page 3-9 to 3-10	<p>"No Action..."</p> <p>It is acceptable to list the APPROVED Rejected and Consolidated Sites and then the sites that are pending regulatory approval for rejection and consolidation per the WIDS/TPA process.</p>	Remove the "No Action" waste sites from this table. And modify the table to reflect if the Rejected and Consolidated sites have been approved by the Regulatory Agencies.			
158.						
159.	Page 3-25, D-22-23 and E-12 and E- 15 and globally	<p>Only a Table (D-12) is presented for MSCM (rad survey data).</p> <p>No maps are provided indicating the location of the hot spots.</p> <p>No dates are presented indicating when additional sampling will be conducted at these sites (as stated on the CSMs) and when other burial grounds will be surveyed.</p>	Add maps indicating the hot spots discovered. Update the CSMs on pages E-12 and E-15. Also note when additional MSCM surveys will be completed for the 218-E-2 and 218-E-5 Burial Grounds and for the remaining burial grounds in the 200-SW-2 OU.			
160.	Section 3.4	This section needs to acknowledge environmental monitoring associated with (and as a result of) <i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds</i> (DOE/RL-2000-72 Revision 0). The document assesses Low Level Burial Ground inventories and constituents of concern. The performance assessment establishes an assessment baseline for monitoring for future required assessments.				
161.	Section 3.4.2, Page 3-40, lines 26-35.	The text describes the potential for plant species to be exposed by contamination and to spread contamination. It is recommended that the text describe herbicide applications to deter plant growth.				

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162.	Section 3.4.2, Page 3-41	The text describes radioactive contamination and survey findings. It is recommended that the workplan include a list of topographic radiation surveys and map radiation readings. This information may be useful for locating spots that have inadequate cover. This information may also be useful for safety considerations for future field work (i.e., topographic surveys, geophysical surveys, etc.).				
163.	Section 3.5.1, Page 3-42, lines 6-10.	It is recommended that the text identify that even though interim status has been terminated for the entire Hanford Site, interim status standards are currently applied to certain RCRA TSD units such as the RCRA low level burial grounds.				
164.	Section 3.5.1, Page 3-42, Lines 23-29.	The text should acknowledge TPA Milestone M-24. Although M-24 is integrated with AEA, CERCLA, and RCRA needs (thus reflecting RCRA groundwater monitoring well needs), the fact that so many LLWMA 1-4 wells have been identified as needed is a clear indication of the significance of the deficiencies associated with the current groundwater monitoring networks.				
165.	Section 3.5.1, Page 3-42, line 23.	The text states: "The monitoring well network in 2007 includes 7 upgradient wells and 10 downgradient wells." If previous groundwater flow maps are considered, the numbers of up- and down-gradient wells would be different. Also, via the RCRA TSD permit application, Ecology has communicated that groundwater flow direction for this unit is uncertain. In fact, considering static water level measurements, Ecology has communicated that a near-	Recommended re-write: "The monitoring well network in 2007 includes what are believed to currently be 7 upgradient wells and 10 downgradient wells".			

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		radial flow can be mapped for this unit. Further complicating this issue is the near-flat water table. Therefore, groundwater flow direction is, at best, difficult to determine and may even be different at different time. Also, for a RCRA TSD unit, it is highly unusual for there to be almost as many upgradient as downgradient wells. The high number of upgradient wells at this unit is not by design. Therefore, the sentence/text should reflect that uncertainty associated with groundwater flow direction.				
166.	Section 3.5.1, Page 3-43, lines 24-25	The text states: "No new wells for LLWMA-1 are included in recent versions of Tri-Party Agreement Milestone M-024." Although this may be true, well needs for LLWMA-1 have been identified for this unit. Due to the milestone's process for prioritization, no LLWMA-1 wells have been identified for construction within the milestone's near-term compliance period. Also, M-24 includes an annual process for identification of well needs. Consistently, Ecology has identified the need for additional LLWMA-1 wells. If the text is going to identify that no new wells are specified for compliance during the near-term, the text should also acknowledge Ecology's administrative acknowledgement of well needs associated with LLWMA-1.				
167.	Section 3.5.2.3, Page 3-43, lines 31-32.	The text states: "The exceedances are related to a regional nitrate plume and not LLWMA-1." Considering that groundwater flow direction has changed and is so difficult to determine combined with the fact that there are	Recommended re-write: "The exceedances are believed to be related to a regional nitrate plume and not LLWMA-1."			

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		significant deficiencies associated with the groundwater monitoring network and program, the statement should be re-written to reflect uncertainty associated with the conclusion.				
168.	Section 3.5.3.2, Page 3-45, lines 14-15.	The text states: "Deeper aquifers are isolated from this landfill by the low-permeability basalts." The possibility of inter-connection between the unconfined and "confined" basalt-aquifer(s) is unknown. Recent evaluations of groundwater levels and barometric pressure affects of near-by wells indicates a "leaky aquifer" (top-of-basalt rubbly surface may allow communication). Also, associated with LERF, USDOE and contractors are planning on constructing new wells at the base of the Ringold where there are currently indications of groundwater (unconfined). Therefore, at this time, it is unknown if the statement is accurate. In fact, there are more indications that the statement is inaccurate.	Either delete the statement or re-write it. Possible re-write wording: "At this time, it is unknown whether deeper aquifer are in communication or are isolated from this landfill by the basalts."			
169.	Section 3.5.3.3, Page 3-45, lines 27-28.	The text states: "Because these constituents also were elevated in the former upgradient well, the source does not appear to be LLWMA-2." Due to the changing hydrogeologic regime (water table elevation, groundwater flow direction, etc.) and the numerous groundwater monitoring network and program deficiencies (as identified by the RCRA Part B permit application NOD), the cause for observations of elevated constituents in the "former upgradient well" are unknown. It is recommended that the unknown cause be acknowledged.	Either delete the statement or re-write it. Possible re-write: "Although these constituents were also elevated in the former upgradient well, the source is currently unknown."			

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170.	Section 3.5.5.3, Page 3-49, line 16.	The sentence stating there is no evidence that LLWMA-4 has contaminated groundwater is without technical and regulatory basis. To the contrary, there is a regulatory basis (exceedances) that there has been a release. In addition, there is a technical vadose zone and riser pipe characterization and monitoring basis indicating that there have been releases from the unit.	Delete the sentence.			
171.	Section 3.5.5.3, Page 3-49, lines 22-23.	The text does not identify the results of vadose zone characterization which have indicated CCl4 and CCl4 degradation product contamination.	Recommended re-write: "Subsequent characterization was performed which determined that CCL4 and CCl4 degradation product contamination is present in the vadose zone."			
172.	Section 3.5.6.3, Page 3-51	Even though there has been over 20 years of monitoring, the section only describes monitoring results of 2006. Include a comprehensive description and identify past releases. In addition, identify that Ecology requested a corrective action plan for this unit.				
173.	Section 3.6.1, Page 3-53, line13.	The parenthetical does not acknowledge the driving force of ruptured pipelines. It is recommended that ruptured pipelines and dust suppression be added to rain and snowmelt variables.	Recommended re-write: ("leaching (contaminant release from rain, snowmelt, ruptured pipeline/leak, water application during dust suppression, etc.)".			
174.	Section 3.6.1, Page 3-53.	Consider adding fire as a release mechanism.				
175.	Section 3.6.1, Page 3-53, line17.	The text states: "It is not likely that groundwater has been impacted from these landfills". <i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds</i>	Delete or re-write the sentence. Possible wording: "Because operational and environmental conditions are unknown, it is not known if groundwater has			

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		<p>(DOE/RL-2000-72 Revision 0) provides conceptual models for contaminant migration under operational and post-closure conditions as Figure 2.3. On page 2.8, the assessment states: "Infiltration and the drainage of moisture through the vadose zone beneath the burial grounds are expected to be much greater during operations than after closure. During the operational period, runoff can accumulate in depressions and open trenches. Although unlikely, under unfavorable conditions (e.g., unusual precipitation event), migration to groundwater could occur in a relatively short time (estimated at 50 to 100 years in Wood et al. 1995, 1996). This is more likely in the 200 East Area burial grounds where the vadose zone is in the Hanford formation (course sands and gravel). If breakthrough occurs during the operational period, it could indicate possible weak points in the waste management system that might need special attention for closure."</p> <p>On page 2.9, the text states: "Possible weak points noted include structural failures. For example, collapse of boxes and containers that have large void spaces could create depressions and openings for collection of snow melt. Such depressions and/or openings would result in enhanced infiltration that could shorten the travel time to groundwater considerably from the estimated rate of 50 to 100 years (based on a uniform infiltration rate of 5 cm/yr)."</p>	<p>been impacted by these landfills."</p>			

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176.	Section 3.6.3.1 on Page 3-56 and 3-57	<p>"Hanford Site Feature, Event, and Process Methodology"</p> <p>Ecology did not participate in this technical effort. Ecology has reviewed the "FEPs" document (SGW-34462, Rev.0) and does not completely agree with the assumptions, results and conclusions of this process as stated in the FEPS document and stated in the work plan.</p>	<p>Make a commitment to re-run the Hanford Site-Specific Features, Events, and Processes methodology when all of the Phase I (A and B both) survey data is collected, including Ecology participation at that time. Specifics to be addressed during this process include, but are not limited to:</p> <ul style="list-style-type: none"> • Review of the specific HFEP categories • Discussion and clarification on the dominant vs subordinate rankings for different parameters (e.g. Composition of Waste Form, Chemical Conditions of the Waste, Human Risk Factors, 			
177.	Section 3.6.2, Page 3-53, lines 20-22.	<p>The text indicates that COPC's for phase II are under development. In addition, the text provides a basis for developing COPC's for phase I-B. Understanding that the COPC's had been agreed upon for phase II, it is not understood why phase I-B wouldn't simply start with the COPC's (which have already been developed for Phase II) and exclude those contaminants that are not "readily detectable via nonintrusive survey techniques".</p>				

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		Clarification of basis and logic is requested.				
178.	Table 3-6, Page 3-54.	The text in the table states that the COPCs include gamma-emitting radionuclides that may be detected by radionuclide surveys from within the caissons. The table does not identify radioactive constituents that may be detected during normal routine health physics technician surveys that are routinely performed prior and/or during entry/access to the burial grounds.	Please include a comprehensive list of COPCs detectable by health physics technicians during routine safety-related surveys.			
179.	Section 3.6.2.1	For completeness, the section should acknowledge exposure to contaminated groundwater in the event that it is confirmed or determined that the burial grounds have contaminated groundwater.				
180.	Section 3.6.2.1	None of the initial CSMs provided/depicted in Appendix E appear to address the operational CSM provided in <i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds</i> (DOE/RL-2000-72 Revision 0). The performance assessment provides conceptual models for contaminant migration under operational and post-closure conditions as Figure 2.3. Considering that none of the burial grounds have been capped to satisfy post-closure performance standards, the omission of this conceptual model renders the HFEP (as evaluated in Phase I-B) significantly deficient.	Include an operational CSM similar to that described and provided by: <i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds</i> (DOE/RL-2000-72 Revision 0). Also, identify in Section 3.6.3.1 text that the "meetings held with representatives of the DQO team and other technical experts" omitted this particular CSM.			
181.	Section 4.1.1, Pages 4-4 and 4-5.	The text states: "The geophysical logging, limited direct pushes, and vapor surveys conducted during Phase 1-B will aid in identifying target locations for intrusive sampling and analysis	Recommended sentence re-write: "The geophysical logging, topographical surveys, limited direct pushes, and vapor surveys conducted during			

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		<p>during future phases of site investigation." Topographical surveys are necessary to identify where precipitation may infiltrate. Topographical surveys should be conducted to identify areas that may have been subject to repeated infiltration during normal rain or snow events. Topographical surveys will be useful to focus sampling on these locations and to identify potential subsidence issues related to worker safety.</p>	<p>Phase 1-B will aid in identifying target locations for intrusive sampling and analysis during future phases of site investigation."</p>			
182.	<p>Section 4.1.1, Page 4-5, lines 9-11</p>	<p>The text communicates the assumption that mobile contaminants will "tend to concentrate in fine-grained sediment layers beneath the burial trenches (~10 to 30 m or 50 to 100 ft)". This identified depth does not agree with the CSM provided/depicted in <i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds</i> (DOE/RL-2000-72 Revision 0). In addition, if there is sufficient water (i.e, during repeated and/or large precipitation events), mobile contaminants may behave differently than described.</p>	<p>Recommended re-write: "For conceptual site models without certain liquid conditions, mobile contaminants...beneath the burial trenches. For conceptual site models including certain liquid conditions, mobile contaminants....may be transported significant distances vertically and/or laterally."</p>			
183.	<p>General and Section 4.1.1, Page 4-5, lines 9-11.</p>	<p>Depending on the CSM, mobile contaminants may or may not occur with moisture. It is recommended that vapor sampling also be performed during direct-push characterization activities.</p>				
184.	<p>pg. 4-7, line 29</p>	<p>The text indicates that geophysical surveys, including gross-gamma, will be performed. This is not consistent with what is presented in the SAP (Appendix A). The SAP indicates that spectral gamma logging will be performed.</p>	<p>Change text to indicate that spectral gamma logging will be performed.</p>			

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185.	Pg. 4-7, line 36	The text states that existing wells will be logged to determine regions of high moisture, which will then be surveyed using gross-gamma, spectral gamma, and passive-neutron instrumentation. It is not sufficient to log only the areas detected as high moisture zones. One of the stated purposes of geophysical logging in this work plan is to gain information on geology and contamination. Gross-gamma surveys will provide information on stratigraphy; however the entire well must be logged in order to gain this information. Spectral-gamma and passive-neutron measurements will determine the presence of contamination. Contamination does not always coincide with high moisture zones, and therefore the entire well should be logged using these methods as well.	Change work plan to include geophysical logging of the entire well casing, not just high moisture zones as indicated by the neutron log.			
186.	pg. 4-7, line 38	The text states, "Dual string casing will be driven into high moisture zones to collect samples for analysis." The SAP does not include the collection of soil samples. However, collection of soil samples is feasible with direct push technologies. See general comment.	Include in the SAP, the collection of soil and vapor samples, via direct push technologies, for all planned pushes.			
187.	Pg. 4-8, line 19	The text states, "Evaluation of the Phase I-B sampling data will be used to determine the current conditions inside the landfills and in adjacent soils at direct push locations." This statement fails to recognize the limitations of the non-intrusive technologies and of a biased sampling approach. The results of all of the technologies that will be used to indicate contamination, including the borehole geophysical and soil vapor technologies, are dependent	Change text, "Evaluation of the Phase I-B sampling data will be used to enhance knowledge of contaminant conditions determine the current conditions inside the landfills and in adjacent soils at direct push locations."			

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		on their location relative to the contamination. For example, the borehole geophysical technologies receive 90% of their signal within 6 inches to 1 ft of the detector. Similarly, the soil vapor surveys detections depend on proximity and flow pathways from the source.				
188.	Pg. 4-8, line 23	<p>The text states, "The Phase II and III investigations will be initiated in the out-years if Phase I-B results show COPC concentration values exceeding preliminary cleanup levels, or if data are inconclusive and cannot provide enough detail to support refinement of the conceptual site models and baseline risk assessment."</p> <p>1) It is unclear what values are being used as preliminary clean-up levels.</p> <p>2) This statement fails to recognize the limitations of the non-intrusive technologies. The results of the Phase I-B investigation are qualitative and should be used as nothing more than to support refinement of the CSM.</p>	Change text, " <u>Based on knowledge gained from the Phase I-B investigation</u> , the Phase II and III investigations will be initiated in the out-years if Phase I-B results show COPC concentration values exceeding preliminary cleanup levels, or if data are inconclusive and cannot provide enough detail to support refinement of the conceptual site models and baseline risk assessment. "			
189.	Section 4.2, Pages 4-8 – 4-10.	Topographical surveys should be performed to focus phase I-B and phase II characterization efforts on areas of potential infiltration and to identify areas of subsidence. The section should describe the conductance of high resolution surface topographic surveys of all burial grounds (e.g., drive transects with Real Time Kinematic GPS). Furthermore, topographical surveys should be performed prior to selection of direct-push locations.				
190.	Section 4.2, Page 4-8,	The statement is inaccurate as geophysical surveys have not been	Add surface geophysical surveys for all Bin 1 landfills			

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	lines 34-36.	performed for 218-E-10, 218-E-12B, 218-E-3A, 218-E-3AE, 218-W-4B, 218-W-4C, and 218-W-5. Surface geophysical surveys should be performed for all the landfills, including the TSDs (excluding the submarine reactor cores and open/operational trenches). These surveys represent the only continuous data set that can be collected, and will support the basis for focusing sampling in future phases.	(TSDs).			
191.	Section 4.2, Page 4-9, line 3.	During Phase II DQO meetings, participants were informed of container shortages. Therefore, it is concluded that wastes containing organics may have been disposed in non-metallic containers or even included with bulk wastes.	Expand the scope of the soil vapor surveys to include widespread coverage of all the trenches with little documentation or with potential for organic-laden waste disposals.			
192.	pg. 4-9, line 3	The text states, "Organic surveys will be focused on those areas that show a strong metallic signature." The technical basis for this is unclear. See general comment.	Expand the scope of the soil vapor sampling to include widespread coverage of all the trenches.			
193.	Section 4.2, Page 4-9, lines 14-20.	The text should specify that direct-push techniques will be performed after topographical surveys are performed.				
194.	pg. 4-9, line 15	The text does not indicate which landfills will receive direct pushes due to flooding.	State in the text which landfills will receive direct pushes because they were flooded.			
195.	pg. 4-9, line 19	The text states that direct pushes will employ gamma logging and moisture logging. Please specify the type of gamma logging and include passive neutron logging and soil sampling.	Please specify the type of gamma logging (gross, spectral) and include passive neutron logging and soil sampling.			
196.	Section 4.2, Page 4-9, lines 7-8.	The text states: "Passive organic-vapor surveys will be used to determine if containers of organic liquids may have been disposed in these landfills." While passive organic-vapor surveys can be	Recommended re-wording: "Passive organic-vapor surveys will be used to determine the presence or absence of organic vapors in burial ground			

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		used to determine the presence of organic vapors, organic-surveys may not be able to determine if in-tact and unvented containers containing organic wastes have been placed in the burial grounds. It is recommended that the sentence be re-written so that expectations of confirmation/validation of existence of "containers of organic liquids" in these burial grounds is not unachievably high.	trenches."			
197.	Section 4.2, Page 4-9, lines 14-18.	As stated above, topographical surveys should be performed to focus phase II characterization efforts on areas of potential infiltration and to identify areas of subsidence. In addition, the topographical surveys should be used to select/determine direct-push locations during phase I-B characterization efforts. The section should describe the direct-push locations being selected/determined based on the topographical survey information. In particular, the section should indicate that topographical surveys will be performed prior to selection of direct-push locations and that the topographical information will be used to select those locations.				
198.	Section 4.2, Page 4-9, lines 16-18.	The text should identify the locations of direct-push due to flooding and ponding. Also, the date and/or documentation of the flooding or ponding event should be provided in the workplan.				
199.	Section 4.2, Page 4-9, lines 18-20.	The text indicates the direct pushes will employ gamma logging and moisture logging. The text should specify the type of gamma logging (gross, spectral). In addition, the direct pushes				

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		provide an excellent opportunity to obtain passive neutron logging and even soil sampling. The text should identify that passive neutron logging will also be performed. The text should also identify the conditions that soil sampling would be performed.				
200.	Section 4.2, Page 4-9, line 26.	The text states: "Borehole and spectral logging will be performed in a number of accessible boreholes..." The text provides criteria and references the SAP for an identification of eligible wells and boreholes. The text should also indicate how eligible wells and boreholes will actually be selected for logging.	The text should also indicate how eligible wells and boreholes will actually be selected for logging.			
201.	pg. 4-9, line 36	The text states that suspected unused portions of the landfills will be evaluated by visual inspection and photo review, and if disturbances are indicated, geophysical surveys may be performed. Surface geophysical surveys are the best way to support determination that a site is unused. Visual inspection and photo evaluation are inadequate to complete this task.	Change text, "Visual inspection of unused portions and annexes of landfills will be performed during site walkdowns, coupled with review of aerial photographs, <u>geophysical surveys, and sampling as necessary to support closure.</u> "			
202.	pg. 4-10, line 15	Magnetometry is used to locate buried <u>ferrous</u> metal objects.	Change text, "Magnetometers permit rapid, noncontact surveys to locate buried <u>ferrous</u> objects or features. This technique is applicable for use with buried <u>ferrous</u> metal waste forms or packages."			
203.	pg. 4-12, line 7	As the text recognizes, direct push technologies can be used to collect samples with minimal waste generation. Since direct push technologies are being used for geophysical logging, it makes sense to obtain soil samples in the process. Soil samples should be	Add soil sampling and organic vapor monitoring to all direct push locations.			

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		collected, unless technical justification can be provided. The text also recognizes that organic vapor monitoring can be performed via direct push. This should be done at all push locations. See general comment.				
204.	pg. 4-12, line 36	The text states that spectral gamma logging will be performed in all accessible boreholes and groundwater wells and "may" be performed in the direct push holes. Spectral gamma should be performed in the direct push holes as it indicates anthropogenic contamination, unlike gross gamma.	Change text (as consistent with the SAP), "Sodium-iodide spectral-gamma logging will also may be performed in the direct-push boreholes."			
205.	pg. 4-12, line 38	The text states, "Borehole-logging equipment currently in use for vadose-zone characterization at the Hanford site includes spectral-gamma logging, neutron moisture logging, and passive-neutron logging." As such, all of these geophysical techniques should be employed in both the direct push holes and in the existing wells.	Change text where necessary to indicate that spectral-gamma, passive-neutron, and active-neutron (moisture) logging will be employed at direct push holes and in existing wells.			
206.	pg. 4-13, line 6	The small diameter of direct push casings may not accommodate use of the HPGe spectral gamma-logging detector, but existing cased wells should be large enough to use this detector.	Add text indicating that the HPGe detector will be used for logging existing wells.			
207.	Section 4.3.3.1, Page 4-12, lines 6-9.	The text acknowledges the direct push methodology can be used to collect samples generating minimal waste (using small-diameter driver). Therefore, soil samples should be collected unless technical or safety reasons prohibit.	Modify the text and identify that soil samples will be collected unless prohibited for technical and/or safety reasons. In addition, modify the text and describe the criteria that will be applied for collecting soil samples.			

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208.	Section 4.3.3.2, Pages 4-12 – 4-13.	The text identifies that certain wells are configured for geophysical logging. The text also acknowledges that spectral-gamma logging, neutron-moisture logging, and passive-neutron logging are currently in use for vadose-zone characterization at the Hanford Site. Where possible, all of these geophysical techniques should be employed in both the direct push holes and in the existing wells.	Modify text to specify that the 3 geophysical techniques, where possible, will be employed at direct push holes and in existing wells.			
209.	pg. 4-17, row 3	Topographical surveys should be conducted to identify areas that may have been subject to repeated infiltration during normal rain or snow events. See general comment.	Topographical surveys should be performed to focus phase II characterization efforts on areas of potential ponding and to identify subsidence issues.			
210.	pg. 4-21 to 4-23, Table 4-2	1) The table indicates (with footnote "m") that the analytical methods for use in Phase I-B are radiological screening, GPR, EMI, TMF, passive soil gas, gamma emissions, and neutron moisture logging. The table does not indicate the use of passive-neutron logging for several variables, including "fission products", "plutonium", and "transuranics". The use of passive-neutron logging is routine at Hanford and should be utilized. 2) Spectral gamma logging with HPGe detector can be used for already existing wells.	1) Add footnote "m" to indicate the use of passive-neutron logging for these variables. 2) Add footnote "m" to indicate the use of spectral gamma logging with HPGe detector for logging existing wells.			
211.	Table 4-1	The table does not identify repeated (routine) precipitation events that allow infiltration due to surface topographic lows including areas of subsidence (past and present). To address the CMS provided/depicted in <i>Performance</i>	Include an additional row that identifies the conductance of high resolution surface topographic surveys of all burial grounds (e.g., drive transects with Real Time Kinematic GPS)			

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		<i>Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds (DOE/RL-2000-72 Revision 0)</i> , an additional row should be added to the table that reflects routine precipitation events combined with topographic lows including areas of subsidence.	as the characterization technique. It is also recommended that the row acknowledge that topographical surveys should be performed to focus characterization efforts of phase I-B and future phases on areas of potential pooling/ponding and infiltration and to identify potential existing or future subsidence issues.			
212.	Section 4.5.2, Page 4-26 and Table D-7	Organic vapor sampling results for certain trenches are provided in Table D-7. The data clearly indicates organic contamination and releases associated with SW-2 OU landfills. However, the text of Section 4.5.2 does not appear to even attempt to interpret the data. It is recommended that, where possible, the data be interpreted. It is also recommended that the information in Table D-7 be plotted on a map or schematic. This information should be combined with the topographic surveys for selection of direct-push locations.				
213.	Figure 5-1, Page 5-2.	The figure does not depict RCRA corrective action. The RCRA permit (Part IV) may also represent the document authorizing selected remedy for past practice sites.	Include RCRA corrective action in the figure.			
214.	Figure E-1, Page E-3.	Contaminant release mechanism via fire does not appear to be depicted in the conceptual exposure pathway model.	Confirm whether fire is included. If not, include the release mechanism.			
215.	Table 5-1, Page 5-5.	The last bullet of the first column stating "there are no known releases from TSD-unit landfills" is incorrect. CCl ₄ and CCl ₄ degradation products detected in riser vents represent releases. In addition, vadose zone	Delete the bullet.			

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		characterization indicates organic contaminant releases. In addition, statistical exceedances of groundwater parameters may indicate releases – unfortunately, the groundwater monitoring programs and networks are inadequate to irrefutably answer the question.				
216.	Table 5-1, Page 5-5.	The first bullet of the second column stating “the need for field characterization is driven by the need for removal or decontamination” is inaccurate. Design of caps/covers requires an understanding of 1) waste inventory, 2) extent of releases, 3) waste configuration, etc. Of significance, field characterization supports remedial action decision-making. Typically, industry will compare the costs of stabilizing, capping, and monitoring with the costs of removal and decontamination prior to making the decision on whether to cap and close versus remove and decontaminate.	Bullet could state: “The need for field characterization can be driven by the need for removal or decontamination.” Alternatively, the bullet could state: “Field characterization supports remedial action decision-making”.			
217.	Table 5-1, Page 5-5.	The sixth bullet of the second column stating “sampling and analysis for TSD-unit landfill closure should be for purposes of the cover” is inaccurate. Considering the lack of records or the quality of records, sampling may be necessary to satisfy land disposal requirements.	Delete the bullet.			
218.	pg. 5-31, Section 5.5.3.2	1) COPC’s should not be “screened”. 2) The text states, “Samples will be collected in Phases II and III from locations that show the highest concentrations of contamination, based on surface geophysics and intrusive	1) Change text, “The project will <u>evaluate</u> screen the list of COPCs developed for the OU <u>and</u> against the anticipated inventories at the landfills, to determine which sites have the highest potential for			

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		<p>and/or non-intrusive evaluations of radionuclide and chemical inventories." Concentrations of contamination are not discernable using surface geophysical methods, and borehole geophysics outside the trenches will provide only limited information on the nature and extent of contamination. Similarly, passive soil vapor detections are based on proximity and flow paths from the source.</p> <p>3) Due to the limitations of geophysical and soil vapor surveys, these methods will allow focusing in later phases to a fairly limited extent. Focused/biased sampling designs are only recommended when reliable physical and historical information are known about a site. See general comment.</p>	<p>releases...".</p> <p>2) Revise text, "Samples will be collected in Phases II and III from locations that show the highest concentrations of contamination, based on information obtained through surface geophysics and intrusive and/or non-intrusive evaluations of radionuclide and chemical inventories."</p>			
219.	pg. 5-32, line 26	<p>The text states, "Based on the results of Phases I-A and I-B, an assessment will be completed concerning the need for additional data collection for each of the bins...If the need for additional data collection is determined...planning for Phase II will be initiated." This statement fails to recognize the limitations of the non-intrusive technologies. The results of the Phase I-A and I-B investigations are qualitative and should be used to support refinement of the CSM and to aid in locating Phase II samples. Phase II sampling will be necessary.</p>	<p>Remove this statement from the text.</p>			
220.	pg. 5-32, line 32	<p>The text recognizes the need for statistical evaluation (95% UCL) of the data resulting from Phase II; however the work plan repeatedly indicates the use of a focused sample design for</p>	<p>Address this in the text.</p>			

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		future phases. This type of sample design prevents proper statistical analyses, including the use of a 95% upper confidence level evaluation of data.				
221.	pg. 5-33, line 32	The text states, "The risk assessment presented in the RI report will use data collected from the Phases I-A and I-B sampling and will allow for initial quantification of risk." It is unclear why data from all phases would not be incorporated into the risk assessment. Data from Phase I should only be used to indicate contamination, but not to rule out contamination and will provide only limited data for risk assessment purposes.	Clarify in the text.			
222.	Page 7-16	SGW-34463, <i>Treatability Investigations Supporting the 200-SW-2 Radioactive Landfills and Dumps Group OU</i> was not submitted to Ecology to review during the review period of the Work Plan. Ecology can not approve or deny (at this time) any information in the Work Plan regarding Treatability Investigations without first reviewing this document.	Provide this document or information in the document that is incorporated into the Work Plan.			
223.	Page 7-16	SGW-35016, <i>Information and Data Management Plan for the 200-SW-2 Radioactive Landfills and Dumps Group OU</i> was not submitted to Ecology to review during the review period of the Work Plan. Ecology can not approve or deny (at this time) any information in the Work Plan regarding Data Management (use of records, sampling and survey data collected in Phase I, etc.) without first reviewing this document.	Provide this document or information in the document that is incorporated into the Work Plan. And provide a framework or basis in the Work Plan that will discuss how the data generated and collected as a part of the Phase I activities will be reviewed and incorporated at the Project level and then used to develop the Phase II characterization.			

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224.	pg. A1-7, line 2	The text indicates that the landfills were binned based on similar characteristics "anticipated to aid in choosing appropriate remedial paths..." This text implies the same remedy for sites within a bin. However, these sites were binned based on historical information that remains to be verified during the RI.	Change text, "This sorting is anticipated to aid in choosing <u>characterization to support choice of</u> appropriate remedial paths..."			
225.	pg. A2-6, Table A2-1	The COPCs identified in this table are not consistent with the COPCs listed in Table 3-6 on pg. 3-54. Table 3-6 includes radioactive constituents which are not shown in Table A2-1. Additionally, the list of COPCs in Table 3-6 does not appear to include radionuclides that may be detected via the proposed borehole geophysical methods (spectral gamma, passive-neutron).	Please include a comprehensive list of COPCs detectable by all proposed methods, including passive vapor and the geophysical methods that are used to determine contamination (i.e. the borehole geophysical methods).			
226.	Page A2-1, section A2.0:	This QAPJP should also comply with the most recent version of DOE/RL-96-68, HASQARD	Add DOE/RL-96-68, (Hanford Analytical Services Quality Assurance Required Documents) to the list of documents which must be complied with.			
227.	Page A2-5, section A2.1.3, lines 17-20:	The text states, "An additional two landfills in the 200-SW-1 OU were included in the DQO, as well as this RI/FS work plan; however, it is proposed that these landfills be closed outside of the CERCLA process. They are included for information purposes only."	Please include the names of the two 200-SW-1 landfills within this section.			
228.	Page A2-16, section A2.2.4, lines 20-22:	The text state, "If the laboratory uses a nonstandard or unapproved method, the laboratory must provide method validation to confirm that the method is adequate for the intended use of the	Edit the sentence as follows: "If the laboratory uses a nonstandard or unapproved method, the laboratory must notify the project of the basis for			

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		data."	the deviation, and obtain prior approval before reporting any data that results from the nonstandard or unapproved method. The laboratory must then provide method validation to confirm that the method is adequate for the intended use of the data."			
229.	Page A2-17, section A2.2.5.2:	The text states, "Field splits of passive soil vapor samples are not considered necessary to be collected under this SAP."	Add the following sentence to the section: "However, Regulator splits will be collected upon Regulator request."			
230.	Page A2-22, section A2.4.1, line 23:	The text states, "Laboratory personnel may perform data verification."	Include within the text, whom else may perform data verification, besides the laboratory personnel. And how it is determined whose responsibility it will be for each data verification case.			
231.	Page A2-23, section A2.4.2, lines 7-9:	The text states, "However, since the passive organic vapor sampling results are used primarily for screening purposes, validation and verification is not warranted. Validation and verification may be applicable for future/follow-on sampling. All other characterization activities involve qualitative reconnaissance-level surveys that will not require data verification and verification." What is specifically meant by "future/follow-on" sampling. Does it pertain to sampling that is within the scope and project plans for Phase I-B, or is this future sampling pertaining to sampling efforts of upcoming phases (e.g., Phase II or Phase III)? Please clarify this within the text. Also, what guidance states that	Perform Level C validation on 5% of all passive organic vapor data. As stated within the comment, this is necessary to determine if quantitative data are of the correct type and are of adequate quality and quantity to meet the project's data quality objectives? Please revise the text throughout the document, where necessary, to reflect that data validation will be done for Phase-IB intrusive characterization data (i.e., passive organic vapor analysis).			

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		validation and verification is not warranted, since the passive organic vapor sampling results are used primarily for screening purposes? Please provide the technical and regulatory basis for this decision. Furthermore, section A2.4.1 states that "Data verification will be performed on analytical data sets to ensure and document that the reported results reflect what was actually done." and "Data validation will be performed on analytical data sets to ensure that the data quality goals established during the planning phase have been achieved." Since the report now reveals that neither verification or validation will be done, how will it be determined if quantitative data are of the correct type and are of adequate quality and quantity to meet the project's data quality objectives?				
232.	pg. A2-6, Table A2-1	It is not clear from the text or table how the COPCs were developed. Are these the only contaminants detectable via the passive gas survey, or was the list of COPCs refined in some way?	Add text to indicate how the list of COPCs was developed.			
233.	pg. A1-7, line 2	The text indicates that the landfills were binned based on similar characteristics "anticipated to aid in choosing appropriate remedial paths..." This text implies the same remedy for sites within a bin. However, these sites were binned based on historical information that remains to be verified during the RI.	Change text, "This sorting is anticipated to aid in choosing <u>characterization to support choice of</u> appropriate remedial paths..."			
234.	pg. A2-6, line 19	The text states, "All other characterization techniques presented in this SAP are essentially field screening/logging techniques." COPCs and performance criteria should still be	Add COPCs to Table A2-1 and add performance criteria to Table A2-2 for all methods used to detect contamination.			

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		identified for all techniques used to detect contamination.				
235.	pg. A2-13, line 8	HEIS is the official data repository per the TPA.	Add text indicating that all pertinent data will be stored in and entered into HEIS in a timely fashion as dictated by TPA procedure.			
236.	Pg. A2-13, line 20	The text states that vapor surveys will be performed in areas showing a strong metallic signature as detected via geophysics. The basis for selecting these locations is unclear. See general comment.	Expand the scope of the soil vapor sampling to include widespread coverage of all trenches.			
237.	pg. A2-13, line 26	The text states that visual inspection and "potential" geophysical surveys of unused areas of TSDs will be performed to support closure. Surface geophysical surveys are necessary to support determination that a site is unused. Visual inspection is inadequate to complete this task.	Change text, "Visual inspection and potential geophysical surveys of unused areas of TSD unit landfills to support administrative closure of these areas."			
238.	pg. A2-20, line 5	The official data repository per the TPA is HEIS. All appropriate data should be stored in HEIS.	Change text, "Electronic data access, when appropriate, will be via a database(s), including HEIS (e.g. HEIS or a project specific database)."			
239.	pg. A3-2, line 34	The text is not consistent with Table A3-1. Table A3-1 indicates that 218-W-3A and 218-W-4C will be sampled for Stage I. Table A3-1 does not indicate that 218-W-3 will be sampled.	Resolve the inconsistencies between the text and Table A3-1.			
240.	pg. A3-3, line 6	It is unclear why stage 2 passive gas surveys are only being performed in trenches with high metallic signatures. See general comment.	Expand the scope of the soil vapor sampling to include widespread coverage of all trenches.			
241.	General Appendix A and Section A3.1.1.1.3,	Topographical surveys should be performed to focus phase I-B and phase II characterization efforts on areas of potential infiltration and to	The SAP should include a description of how and when topographical surveys will be performed.			

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	Page A3-12, lines 2-7	identify areas of subsidence. The section should describe the conductance of high resolution surface topographic surveys of all burial grounds (e.g., drive transects with Real Time Kinematic GPS). Furthermore, topographical surveys should be performed prior to selection of direct-push locations.				
242.	A3.1.1.2, Page A3-12, lines 9-19 and table A3-3.	Surface geophysical surveys should be performed for all the landfills, including the TSDs (excluding the submarine reactor cores and open/operational trenches). These surveys represent the only continuous data set that can be collected, and will support the basis for focusing sampling in future phases. Table A3-3 should be expanded to include geophysical surveys for those landfills where a geophysical survey hasn't been performed.				
243.	pg. A3-15, Section A3.1.1.3	Surface geophysical surveys are necessary to support determination that a site is unused. Visual inspection will not be adequate for closure.	Include surface geophysical surveys to verify that trenches are unused.			
244.	pg. A3-16, line 9	The text states that "Logging data will be reviewed for applicability to 200-SW-2 OU landfills." It is not clear how applicability will be determined.	Include in the text a discussion of the criteria that will be considered in this review.			
245.	pg. A3-16, line 14; pg. A3-17, Section A3.1.2.1.1	The text states that at least one upgradient and one downgradient well will be logged. The SAP should clearly identify which wells will be logged for all burial grounds. Considering that borehole geophysical methods detect contamination within 1-2 feet of the detector, the distance of the well from the burial grounds should be an important consideration in the selection of wells for logging.	Add a list indicating which wells will be logged and the criteria for their selection.			

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246.	pg. A3-16, Section A3.1.2.1	Logging at Hanford routinely includes passive neutron logging for detection of alpha-emitting radionuclides. This method should be performed in the selected wells.	Add passive neutron logging as a geophysical method for logging existing wells.			
247.	pg. A3-16, Section A3.1.2.1	The text does not indicate the depth to which existing wells will be logged.	Indicate within the text or table the depth to which existing wells will be logged.			
248.	pg. A3-17, line 31	The text states that direct pushes will be installed to obtain spectral gamma, neutron moisture "and/or passive neutron logs". Passive neutron logging has a different application than spectral gamma or neutron moisture logging and should be used in conjunction with these methods.	Change text, "Direct-push holes will be installed to obtain spectral gamma, neutron moisture, and/or passive neutron logs..."			
249.	Pg. A3-12, Section A3.1.1.2	Following this phase, surface geophysical surveys will have been performed for all landfills except the TSDs. Although more historical documentation exists for the TSDs than for the other landfills, surface geophysical surveys are necessary to confirm trench boundaries and are the best way to gain continuous information to focus phase II sampling. See general comment.	Add surface geophysical surveys for all Bin 1 landfills (TSDs).			
250.	pg. A3-22, Section A.1.2.2.1	One direct push per landfill, in between trenches, will provide limited information to focus later phase sampling. Geophysical logging methodologies will provide information immediately in the vicinity of the detector; whereas, contamination and stratigraphy are likely to vary considerably over the area of the landfill. For the borehole geophysical methods to provide locations of focus, they must be applied at many more locations.	Include justification for the proposed samples design and add direct push locations for a more systematic approach.			

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251.	Pg. A3-22, Section A3.1.2.2.1	As the text recognizes (pg. 4-7), direct push technologies can be used to collect samples with minimal waste generation. Soil and vapor samples should be collected via direct push (see general comment).	Include soil and vapor sampling via direct push at all locations where direct pushes will be performed.			
252.	pg. A3-22, line 4	Logging is not described in section A3.1.1.3. Section A3.1.1.3 pertains to visual inspection of landfills.	Please correct the reference in the text.			
253.	pg. A3-23, line 4	The text states that logging in landfills that have experienced historical events will be performed as described in Section A3.1.1.3. Section A3.1.1.3 pertains to visual inspection of landfills.	Please correct the reference in the text.			
254.	Page 3-1, section A3.1.1.1, line 35:	Add the following to the sentence, "...or have the potential to do so."	Refer to comment.			
255.	Page 3-2, line 15:	Please quantify what will be determined as a "relatively high" soil vapor measurement.	Refer to comment.			
256.	Page 3-1, section A3.1.1.1, line 35:	Add the following to the sentence, "...or have the potential to do so."	Refer to comment.			
257.	Page 3-21 and Appendix A	No GPR planned for the 218-W-3A Burial Ground.	Provide a definitive basis or add GPR for the 218-W-3A Burial Ground for Phase I-B.			
258.	Page 3-22 and Appendix A	No GPR planned for the 218-W-4B Burial Ground.	Provide a definitive basis or add GPR for the 218-W-4B Burial Ground for Phase I-B.			
259.	Page 3-22 and Appendix A	No GPR planned for the 218-W-4C Burial Ground.	Provide a definitive basis or add GPR for the 218-W-4C Burial Ground for Phase I-B.			

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260.	Page 3-24 and Appendix A	No GPR planned for the 218-W-5 Burial Ground.	Provide a definitive basis or add GPR for the 218-W-5 Burial Ground for Phase I-B.			
261.	Page 4-7 and Appendix A	No GPR planned for the 218-W-3AE Burial Ground.	Provide a definitive basis or add GPR for the 218-W-3AE Burial Ground for Phase I-B.			
262.	Page 4-9 and Appendix A	No GPR or passive soil gas monitoring planned for the 218-E-10 Burial Ground.	Provide a definitive basis or add passive soil gas monitoring and GPR for the 218-E-10 Burial Ground for Phase I-B.			
263.	Page 4-9 and Appendix A	No GPR or passive soil gas monitoring planned for the 218-E-12B Burial Ground.	Provide a definitive basis or add passive soil gas monitoring and GPR for the 218-E-12B Burial Ground for Phase I-B.			
264.	Figures E-2 – E-7, Pages E-4 – E-9.	To address the CSM provided/depicted in <i>Performance Assessment Monitoring Plan for the Hanford Site Low-Level Burial Grounds</i> (DOE/RL-2000-72 Revision 0), additional CSMs reflecting operating (i.e., non-stabilized or non-capped) conditions with infiltrating precipitation need to be added to each figure. Such CSMs would reflect the potential for contamination migration to extend to groundwater.				
265.	Page E-19	Deficient CSM information.	Add package types and burial configuration information to the CSM.			
266.	Page E-20	Deficient CSM information.	Add burial configuration information to the CSM.			
267.	Page E-30	CSM lists that the 218-W-4B contains "11" Caissons. The text and supporting information states there are "12".	Resolve this information and correct either the text or CSM.			