

REVIEW COMMENTS ON QAPJP OF DOE/RL-90-07 RI/FS WORK PLAN DRAFT B FOR 100-BC-1

SUBJECT: Review of Project Specific Quality Assurance Plan (QAPJP) for the 100-BC-1 Operable Unit (Appendix "A" of 100-BC-1 Work Plan Draft B).

REFERENCE DOCUMENTS:

- #1 TPA Document #89-10 of 5/89 and Rev #1 of 9/90 and Rev #2 of 9/91
- #2 QAMS-004 of 9/80 and QAMS-005 of 12/80
- #3 DQO for Remedial Response Activities Document EPA/540/G-87/003 Of 3/87- Description of Requirements
- #4 DQO for Remedial Response Activities Document EPA/540/G-87/004 of 3/87- A RI/FS Example of a DQO Case Study
- #5 WHC-EP-0383 of 12/90 - QAPP for Env Engineering/Technology/Permitting
- #6 DOE Letter 91-ERB-171 of 9/30/91 (RI/FS Work Plan Review Instructions)

GENERAL COMMENTS:

- o The document reviewed, Appendix "A" of Work Plan, is the project specific QA Plan- the QAPJP. The QAPJP frequently references sections of the Work Plan to fulfill QA requirements. These sections were reviewed for compliances.
- o Each numbered comment below is a non-compliance to the indicated DOE/EPA QA criteria. The EPA QA criteria are found in the documents #1, #2, #3, #4, and #5 of "Reference Documents". The comments are in the specified format.
- o The document reviewed is a TPA Primary Document and represents the result of a continuous consensus/decision process between DOE/EPA/WDOE.
- o The QAPJP is a project specific document. The final version, it is expected would consider and incorporate comments, as necessary, appropriately.
- o The RI/FS Investigation work (LFI) in this Work Plan (WP) is limited to Source and Vadose Zone Investigations. WP Table 3-1 and Table 4-2 show Sources for Investigation. Table C-2 scopes the investigation/analysis work.
- o The comments are made keeping in mind the above features and that quality achievement is a line responsibility.

COMMENT #1: QAMS-005 Sec 5.5 & QAPJP Sec 3.0 (Pg A-3) -Data Quality Objectives for Measurements

o The QAPJP refers to Work Plan (WP) Sec 4.1.1, Sec 4.1.2, and Sec 4.2.1.5 and states that Sec 4.2.1.5 provides justification for the established DQOs. The Sec 4.2.1.5 is not present in the WP or in the QAPJP.

o Table QAPJP-1 lists various pollutants and the analytical Methods to be used to quantify them. Precision and accuracy statements linking the selected method (in Table QAPJP-1) to the experimental conditions or detection limits for each pollutant are missing.

o In Table QAPJP-1: "Precision" is defined "Relative Percent Difference" (RPD). The EPA document EPA/540/G-87/003 illustrates the use of the "Relative Standard Deviation" (RSD) and "Variances" (S) for evaluating data values of like samples analyzed with like procedures at various laboratories and to determine the acceptable range of values. WHC needs to formalise RPD usage as RPD use is not illustrated in the EPA/DQO documents.

COMMENT #2: QAMS-005 Sec 5.6 & QAPJP Sec 4.0 (Pg A-8) - Sampling Procedures  
QAMS-005 Sec 5.7 & QAPJP Sec 5.0 (Pg A-12) - Sample Custody

The QAPJP refers to WHC-CM-7-7 for Project Specific Sampling Procedures. WHC-CM-7-7 has many procedures that describe segments of the Sampling Effort but there is no procedure in WHC-CM-7-7 for project specific "Sample Labelling" or for "Frequency of Sampling" or for "Sampling Time Variant Data". The existing





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procedure for "Sample Custody" does not provide tracking mechanisms for the labelled sample that have the same rigor as that described in QAMS-005. Table QAPJP-2 has inadequate information to perform project specific "Sample Site Selection". Project specific procedures for Geodetic Control indicated in WP Sec 5.1.2.2 to be present in QAPJP are not found there. Procedures in Table QAPJP-2 are generic not project specific and some are yet to be done (TBD).

COMMENT #3: QAMS-005 Sec 5.8 & QAPJP Sec 6.0 -Calibration Procedures/Frequency.  
QAMS-005 Sec 5.9 & QAPJP Sec 7.0 -Analytical Procedures (Pg A12/13)

The QAPJP refers to Tables QAPJP-1 and QAPJP-3 for achieving compliance with criteria requirements. These tables identify ASTM standards and EPA documents to achieve compliance. Project specific Standard Operating Procedures (SOPs) describing calibration of each pollutant measurement system, with its planned recalibration frequencies, and with information on calibration standards used is not in the QAPJP or the WP. Since all requirements of any analytical test standard may not apply to all situations, specific analysis procedures for each pollutant are required but are missing. The analysis work is partly a "Purchased Service" and partly performed in-house by WHC: example radio assays. Project specific procedures for in-house analysis, analytical levels, instrument sensitivity, calibration, and its frequency are not stated. Analytical levels that would make precision and accuracy statements useful are not given in the QAPJP or in Work Plan for the selected methods.

COMMENT #4: QAMS-005 Sec 5.10 & QAPJP Sec 8.0 (Pg A-13/15)-Data Reduction, Validation, and Reporting.

The QAPJP lists criteria that shall be contained in procedures used for the validation of data. The criteria that is listed does not provide adequate information or include the data reduction scheme for each measured parameter, the set of principal criteria to be used to validate data/integrity, or the reporting scheme and/or flow-chart for the planned data flow for the entire data collection process. This applies to the in-house effort and as applicable to purchased services.

COMMENT #5: QAMS-005 Sec 5.14 & QAPJP 12.0 (Pg A-19) - Routine Procedures to Assess Data Precision, Accuracy, and Completeness.

The QAPJP states that statistical techniques may be used to perform this activity. If such techniques are used then the required written instructions shall be generated. QAMS-005 requires that the specific procedures needed to perform any task(s) on a routine basis must include all essential statistical detail and must be described for all environmental measurement and monitoring. These procedures are not described in the Work Plan or the QAPJP for the in-house work and/or for the purchased services as applicable.

COMMENT #6: QAMS-005 Sec 6.0 - QAPJP vs Project Work Plans

A significant number of the QA elements are addressed minimally in the QAPJP and the details on these elements are integral to the Work Plan. QAMS-005 requires a "QA Project Plan Locator Page" be provided that enables reference of QA elements/WP text for assessing QA compliance. This page is missing.

ATRI-100-BC-1-RI/FS

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5. Document Number(s)/Title(s) Remedial Investigation/Feasibility Study Work Plan for the 100-BC-1 Operable Unit	6. Program/Project/ Building Number	7. Reviewer Bill Fryer CNES	8. Organization/Group GSSC	9. Location/Phone 6-9830
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17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)

Date

Reviewer

Date

Reviewer

Project/Cognizant Engineer

Project/Cognizant Engineer

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1.	General Comment, Figures: If the figures were placed in the text after the reference, the clarity of the text would be enhanced. Figures that do not contribute to text clarity could be added to the end of the chapter or to an attachment (e.g., raw data and boring logs).			
2.	General Comment: Minor variations in format, titles, and level of detail exist between the 5 initial rescope work plans, for example between the 100-BC-1 and BC-5 Work Plans in the title of Section 2.1.2.2.1. However, the variation in text and detail level are not deemed to significantly impact this document, unless stated in the Specific Comments.			
3.	Page vii, Sec. 3.4: The original outline of the "Letter Report" has the term "interim" instead of "preliminary".			
4.	Page vii, Sec. 4.2.3, 4.2.4, and 4.2.5: These sections described in the "Letter Report" are not present in the outline and text.			



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5.	Page vii, Sec. 5.0, 5.1, 5.2, and 6.0: The titles of these sections on the outline and text have not been changed to agree with the "Letter Report" outline.			
6.	Page ix, List of Figures: The slash in 100-B/C Area is not used consistently throughout the page.			
7.	Page WP 1-1, Section 1.0, Par. 2, Sen. 6: The word "authority" needs to be added to end of sentence, to be consistent with DOE/RL-90-08.			
8.	Page WP 1F-1, Figure 1-1: This figure is referenced in the text as containing the NPL sites at the Hanford Site. The title of the figure is very general. NPL sites are not mentioned on the figure.			
9.	Page WP 1F-2, Figure 1-2: The figure is cluttered and the key does not explain all of the listed building abbreviations. Table 2.1 should be placed closer to the text to clarify the building abbreviations. Reference is made to "Note 1" but only "Note" is found at the bottom of the page.			
10.	Page WP 2-1 to WP 2-27: The BC-1 document text varies from the BC-5 document. Different changes in sentence construction were made and sometimes sentences were omitted or added. The content, for the most part, did not change. However, the two documents should be made to be uniform in the parts that belong in both sections.			
11.	Page WP 2-1, Sec. 2.1.1, Par. 5, Sen. 6: Minor discrepancies appear to exist between the operable unit boundary coordinates stated in the text and the cross-hatched delineation of the operable unit in Figure 1-2 (Section 1.0). Please recheck the coordinate values and modify either the text or the figure.			

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12.	Page WP 2-2, Sec. 2.1.2.2.1, Par. 5: A statement should be included about the crib being completely underground or aboveground. Only crib 116-B-6A is referenced as being subject to the ISV treatment although crib 116-B-6B is later mentioned as receiving the ISV treatment. The construction materials for the cribs are not mentioned in the text.			
13.	Page WP 2-2, Sec. 2.1.2.2.1, Par. 5, Sen. 4: In the text, the 116-B-6A crib measures approximately 4m long and buried 2m deep. The document DOE/RL-90-08 states that the crib is approximately 3.7m long and the bottom of the crib is approximately 4.6m.			
14.	Page WP 2-3, Sec. 2.1.2.2.2, Par 5: The regulatory agency may want to know the specific level of radiation that has been allowed to remain for decommissioned buildings by the ARCL methodology.			
15.	Page WP 2-4, Sec. 2.2.1, Par. 5: The text should include a reference to Gable Mountain to avoid confusion with Gable Butte in later sections.			
16.	Page WP 2-4, Sec. 2.1.4, Par. 5, and Page WP 2-5, Sec. 2.1.4, Par. 0: Capitalization should be consistent with all bullet entries.			
17.	Page WP 2-8, Sec. 2.1.4.1.1, Par. 1: The construction materials of the two waste water systems are not adequately described. The term "trench" is particularly confusing in that a trench could be naturally clay-lined or constructed of concrete. The construction materials would clarify how much potential these units had for leaking. The ultimate discharge of the cooling water is not clear. Did the cooling water infiltrate in the trenches or did the cooling water return to the basins to be discharged to the river?			



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18.	Page WP 2-11, Sec. 2.1.4.3, Par. 2, 3: Buildings 132-B-4 and 132-B-5 are not shown on Figure 2-1.			
19.	Page WP 2-12, Sec. 2.1.4.4, Par. 1, Sen. 2 and Par. 3, Sen. 1: For consistency, the site designation number (132-B-1) should be used instead of the building number (108-B).			
20.	Page WP 2-12, Sec. 2.1.4.5, Par. 4: Seven septic tanks are recorded in BC-1 while nine septic tanks are recorded in BC-5.			
21.	Page WP 2-14, Sec. 2.1.1.5, Par. 2, Sen. 2: The list of operable units for which work plans are being prepared is not consistent with the list in DOE/RL-90-8. This difference should be rectified.			
22.	Page WP 2-14, Section 2.1.4.8: This summary section is not included in BC-1.			
23.	Page WP 2-15, Sec. 2.2.2.1.3, Par. 4, Sen. 2: The acronym "Ma" needs to be defined and included in the List of Acronyms.			
24.	Page WP 2-15, Sec. 2.2.2.1.3 and Page WP 2F-5, Figure 2-5: The age for the Ringold Formation, is not included on Figure 2-5.			
25.	Page WP 2-16, Sec. 2.2.2.1.3, Par. 1, Sen. 7: The word "... intercalated..." should be "... intercalated..."			
26.	Page WP 2-17, Sec. 2.2.2.2.1, Par. 4: A discrepancy exists between the measurement of 201m in BC-1 and 183m in BC-5.			
27.	Page WP 2-17, Sec. 2.2.2.2.1, Par. 4, Sen. 4: The thickness of the sediments overlying the basalts is stated to be approximately 660 feet. In the 100-BC-5 Work Plan, the thickness is stated to be approximately 600 feet.			

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28.	Page WP 2-18, Sec. 2.2.3.1, Par. 2, last sentence: Cold Creek and Dry Creek Valleys should be labelled on an existing map in the work plan.				
29.	Page WP 2-19, Sec. 2.2.3.2.1, Par. 0, last sentence: Given the lack of detail of the geologic descriptions on the driller's logs, addition of a qualifier would be more precise. For example, "... logs provide a general description...".				
30.	Page WP 2-19, Sec. 2.2.3.2.3, Par. 3, Sen. 5: The sentence of BC-1, "The upper surface of the unconfined aquifer is in silty, sandy gravels of the Hanford formation," is different in content than the sentence in BC-5.				
31.	Page WP 2-19, Sec. 2.2.3.2.3, Par. 3: Whether the reversals are in horizontal or vertical gradients should be indicated.				
32.	Page WP 2-20, Sec. 2.2.3.2.4, Par. 3, Sen. 1: A comma is needed after "Columbia River."				
33.	Page WP 2-20, Sec. 2.2.3.2.5, Par. 4: More detail should be provided on the cause of the recharge to the groundwater. What was the frequency and quantity of discharge that caused the recharge?				
34.	Page WP 2-21, Sec. 2.2.4.3, Par. 1: The numbers "4" and "7" should be written as words.				
35.	Page WP 2-21, Sec. 2.2.4.3, Par. 4: Low flow characteristics of the Columbia River are not mentioned in much detail. These flows may be needed to determine the ARARs for effects on aquatic life.				
36.	Page WP 2-23 to 2-24, Sec. 2.2.6.1 and 2.2.6.2: Details of the land use of residents and the affects on flora and fauna have not been included in BC-5.				



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37.	Page WP 2F-1, Figure 2-1: There are two units labelled "116-B-15" on the figure (one south of 116-B-11 Retention Basin and one east of B Reactor Building). Is one of these supposed to be labelled "116-B-13"?				
38.	Page WP 2F-1, Fig. 2-1: The legend does not include all the buildings on this drawing. Table 2.1 has descriptions of many of the buildings but is not referenced or located in close proximity to this figure.				
39.	Page WP 2F-16, Fig. 2-15: This figure and Figure 2-21 are the same sized maps yet their scales are different.				
40.	Page WP 2F-16, Figure 2-16; Page WP 2F-18, Figure 2-18; Page WP 2F-19, Figure 2-19; and Page WP 2F-21, Figure 2-21: Portions of these figures are illegible and needs to be checked for consistency.				
41.	Page WP 2F-17, Figure 2-17: Geologic descriptions for the Middle Ringold Formation are written on the cross section on either side of Well B3-2 (assumed to be 199-B3-2). The descriptions differ, but no other well is shown or described to have been drilled in that area of the cross section. Only one geologic description should be shown on the cross section unless the source for the difference in geologic materials north versus south of well B3-2 can be described.				
42.	Page WP 2T-1, Table 2-1: Buildings 106-B, 118-B-8, 185-B, 187-B1, 1701-B, 1702-B, 1705-B, 1707-A-B, 1707-B-B, 1709-B, 1720-B, and 1736-B are not on Figure 2-1. The buildings 186-B, 1707-B-6, and two 182-Bs are on the Figure 2-1 but not described on the Table.				



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43.	Page WP 3-1, Sec. 3.0-3.1: Chapter 3 of the "Letter Report" presents the overall data quality objective (DQO) with a bias for action and the observational approach for conducting the LFIs and then the IRM. These introductions do not include the LFI or IRM strategy.			
44.	Page WP 3-2, Sec. 3.1.1, Par. 1, Sen. 1: "Significance" needs to be changed to "significant". The phrases "in terms" and "considered to be" need to be omitted.			
45.	Page WP 3-2, Sec. 3.1.1, Par. 1, Sen. 2: "Large quantities" needs to be substituted for "tens of millions of gallons". "Sources involved releasing the wastes" needs to be changed to "sources released wastes".			
46.	Page WP 3-3, Sec. 3.1.1.1.1, Par. 3, Sen. 1: The depth of 20 ft given for 116-B-11 Retention Basin does not correspond with 24 ft depth on Table 3-1, Page WP 3T-1b.			
47.	Page WP 3-4, Sec. 3.1.1.1.1, Par. 3, Sen. 7: The term "soil column" here is not the same (or is the same?) as "soil column" used on page WP 3-3, Par. 2, Sen. 2. Is "soil column" being used for two different things? If it is, two different terms should be used to avoid confusion.			
48.	Page WP 3-5, Section 3.1.1.1.2, Par. 1, Sen. 5: The word "basins" needs to be changed to "basin".			
49.	Page WP 3-5, Sec. 3.1.1.1.3: These sample results should be provided on a table.			
50.	Page WP 3-5, Sec. 3.1.1.1.3, Par. 3, Sen. 1: The 120 ft length does not correspond with the 65 ft length on Table 3-1.			

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51.	Page WP 3-5, Sec. 3.1.1.1.3, Par. 3, Sen. 4: The 65 ft length does not correspond to the 120 ft length on Table 3-1.			
52.	Page WP 3-5, Sec. 3.1.1.1.4, Par. 5, Sen. 2: The 16 ft depth does not correspond with the 20 ft depth on Table 3-1. Also, "in use from 1946 to 1954" does not correspond with Table 3-1.			
53.	Page WP 3-6, Sec. 3.1.1.1.5, Par. 2, Sen. 1: The 16 ft depth does not correspond with the 25 ft depth on Table 3-1. Also "used from 1952 until 1958" does not correspond to 1952-1968 on Table 3-1.			
54.	Page WP 3-6, Sec. 3.1.1.1.5, Par. 3, Sen. 3: Why was <sup>63</sup> Ni not reported?			
55.	Page WP 3-8, Sec. 3.1.1.2.2, Par. 1, Sen. 2: Figure 2-1 should be referenced for the location of pond 116-B-15.			
56.	Page WP 3-8, Sec. 3.1.1.3.1, Par. 3, Sen. 1: The dimensions do not correspond with those on Table 3-1.			
57.	Page WP 3-9, Sec. 3.1.1.3.5, Par. 4, Sen. 1: The dimensions do not correspond with those on Table 3-1.			
58.	Page WP 3-10, Sec. 3.1.1.3.5, Par. 1, Sen. 4 and 5: It would be helpful to the reader to state, in this section, what background soil concentrations are for chromium, lead, and zinc, even if it is already presented somewhere else.			
59.	Page WP 3-10, Sec. 3.1.1.3.8, Par. 4, Sen. 4: The phase "from 1950 to 1958" does not correspond to "1950-1968" on Table 3-1.			
60.	Page WP 3-13, Sec. 3.1.2.1, Par. 2, Sen. 2: "No background soil data have been developed for nonradioactive inorganic contaminants such as ...			



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61. cont.	chromium." However, page WP 3-10, Par. 1, Sen. 4 and 5 states that chromium levels are close to background concentrations, and lead and zinc are significantly above background. What concentrations are being used for background in soil? The text on these two pages seem to contradict.		
61.	Page WP 3-14, Sec. 3.1.2.2, Par. 1, Sen. 2: Change to "Several soil borings were drilled ...".		
62.	Page WP 3-14, Sec. 3.1.2.2, Par. 2, Sen. 4: The sample results from boring BB on Table 3-25 has not been included.		
63.	Page WP 3-14 to 3-16: The figures are referenced in the following order: 3-1, 3-2, 3-7, 3-5, 3-8, and 3-9. Normally, figures are referenced in numerical order.		
64.	Page WP 3-16 and WP 3-17, Sec. 3.2: Although there is little difference in meaning, the EPA refers to "contaminant-specific ARARs" as chemical-specific ARARs in the guidance document <u>CERCLA Compliance With Other Laws Manual</u> (OSWER Directive 9234.1-01, August 8, 1988).		
65.	Page WP 3-18, Sec. 3.2.1.1.5: Insert the abbreviation "MCLs" after the words "maximum contaminant levels."		
66.	Page WP 3-20, Sec. 3.2.4.1, Sen. 1: Most contaminants in the vadose zone soil, with the exception of PCBs, do not have clean-up standards (i.e., ARARs). Therefore, clean-up standards are developed considering potential effects on (1) humans or other sensitive receptors (e.g., plants and animals) and (2) other environmental matrices such as groundwater beneath the vadose zone. This section only discusses the first type (item (1)).		

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67.	Page WP 3-21, Sec. 3.2.4.1, Par. 0, third line: Insert the word "excess" after the phrase "...no more than one...". This is important since the average person has about a one in four chance of getting cancer during the average lifetime (70 year exposure duration assumed by EPA). Thus, the $10^{-4}$ to $10^{-6}$ excess upperbound lifetime cancer risk means that the odds for cancer increase from 25 percent to a range of 25.01 to 25.0001 percent.			
68.	Page WP 3-28, Sec. 3.4: This section, although wordy, presents a good discussion of preliminary remedial response objectives, technologies, and alternatives. As such, it does not require any changes.			
69.	Page WP 3-28, Sec. 3.4, 3.4.1: The Preliminary Response Action Objectives are very general and do not emphasize the specific DQO for the stages of the project (before, during and after remediation). The specific LFI objectives are not mentioned for the soil borings, groundwater sampling, data validation, and physical properties and analyses as discussed on pages 29-32 of the "Letter Report".			
70.	Page WP 3-30, Sec. 3.4.2: Pages 35-37 of the "Letter Report" include discussions on this section. From the "Letter Report", "The work plans will make recommendations as to the range of preliminary interim remedial action alternatives that will be considered. The alternatives will be developed on a preliminary basis to provide information on the impacts of various potential ARARs, point of compliance, and land use scenarios with respect to differing process technologies". Although the alternatives can be more fully developed and evaluated in the focused feasibility study, the document writers have interpreted this in			



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71. cont.	a very general sense. The preferred approach would be to elaborate on the different interim remedial technologies and discuss which specific technologies would be feasible for specific units. Also, which ARARs are suspected of being limiting at different land units and what are some of the specific land uses of concern that may be affected by the potential treatment technologies?			
71.	Page WP 3F-1, Figure 3-1: The "116-B-13" trench is not on the figure.			
72.	Page WP 3F-3, Fig. 3-3: The tritium handling area has not been indicated on the drawing.			
73.	Page WP 3F-11, Fig. 3-11: The column, "Potential Conflicts with ARARs or Future Land/Water Use" contains conclusions that are not discussed in the text.			
74.	Page WP 3F-15, Figure 15: Symbols in the legend are not consistent with the figure. Primary sources are shown in circles in the figure, but circles are not included in the legend.			
75.	Page WP 3T-1b, Table 3-1: The unit "116-B-13" is not on Figure 2-1. Is this the 116-B-15 trench located south of the 116-B-11 Retention Basin?			
76.	Page WP 3T-1b, Table 3-1: The unit "118-B-8" is not on Figure 2-1. To match Table 3-1, the "B Reactor Building" on Figure 2-1 should be labeled "118-B-8".			
77.	Page WP 3T-1B, Table 3-1: "126-B-3" is shown on Figure 2-1 but is not on Table 3-1. Is there a "126-B-2"?			

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78.	Page WP 3T-4, Table 3-4: The table should have double horizontal lines below rows for 13.5 ft depth and 5.5 ft depth, to follow same format as Table 3-7 and to help the reader visualize concentration ranges with depth.			
79.	Page WP 3T-15, Table 3-15: The column labeled "Storage Basin" should be changed to "Fuel Storage Basin" to correspond with text on page WP 3-7, Sec. 3.1.1.2.2.			
80.	Page WP 3T-23, Table 3-23, Footnote a: "Onsite and offsite are shown on Figure 3-1..." is stated in Footnote a. Should this really be Figure 3-5?			
81.	Page WP 3T-26a, Table 3-26: A double line should go below the row for B20.			
82.	Page WP 3T-30, Table 3-30, Footnote b: Figure 3-3 should be changed to Figure 3-7.			
83.	Page WP 3T-31, Table 3-31, Footnote a: Figure 3-1 should be changed to Figure 3-5.			
84.	Page WP 3T-32, Table 3-32, Footnote a: Figure 3-5 should be changed to Figure 3-8.			
85.	Page WP 3T-34, Table 3-34: Other non-radioactive waste is mentioned in the text as potential sources of pollutants such as coal, oil, fuels, and solvents. Constituents for these materials are not mentioned. Additionally, PCBs that may have been present in certain hydraulic fluids and aluminum in the alum from the water plant are also not mentioned.			
86.	Page WP 4-3 to 4-7: The data needs are not adequately divided into "general needs" and "limited investigation needs".			



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87.	Page WP 4-7, Par. 1, Sen. 3: The phrase, "where the data will be collected" is not in agreement with the preceding gerund phrases.			
88.	Page WP 4-7, Sec. 4.1.2.3, Par. 0, Bullet 6: Are treatability studies a part of the Hanford Site Past-Practice RI/FS process? Are they equivalent to "pilot-scale tests" (page WP 4-11, Par. 2, Bullet 1)? No mention of "treatability studies" appears in Chapter 1.0 or Figure 1-3. A discussion of the purpose, extent, and timing of treatability studies be added in the document. The difference, if any, between treatability studies and pilot-scale tests should be clarified.			
89.	Page WP 4-14, Sec. 4.2.2.1, Par. 1, Sen. 1 and 3: Details regarding field screening methods for volatile organics and radionuclide screening should be added to Chapter 5.0 and referenced in Section 4.2.2.			
90.	Page WP 4-14, Sec. 4.2.3: This section is present in BC-5 but not in BC-1.			
91.	Pages WP 4T-1a, -1b, and 1c, Table 4-1: The six "Purpose of Data" column headings should be retitled and rearranged from left to right to correspond with the titles of Sections 4.1.2.1 through 4.1.2 (pages WP 4-5 through WP 4-9). In the current fifth and sixth column headings, the RCRA terminology (corrective measures study) should be changed to the corresponding CERCLA terminology.			
92.	Page WP 4T-2a, Table 4-2: For 116-B-1, under "Investigation Approach", the phrase "Analyses will be conducted for physical soil properties" needs to be added.			



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93.	Page WP 5-1, Sec 5-1, Par. 4: A statement is not provided in the text about which tasks are part of BC-1 or BC-5. The locations of the schedules for tasks not included in this work plan are not referenced.			
94.	Page WP 5-1, Sec. 5.0 and Sec. 5.1: The titles of Section 5.0 and 5.1 have not been changed to correspond to the outline.			
95.	Page WP 5-1, Sec. 5.1, Par. 4: The described tasks are for the LFI and not the RI as stated.			
96.	Page WP 5-4, Sec. 5.1.2.1, Par. 4, Sen. 3: The word "consisted" needs to be changed to "consists".			
97.	Page WP 5-6, Sec. 5.1.2.3.1, Par. 2: Why is the 116-B-11 Retention Basin not being sampled during Activity 2c-1 Source Sampling?			
98.	Page WP 5-9, Sec. 5.1.5.2, Par. 2, Sen. 3 and 4: Change "these ... facilities" to "this ... facility". Change "each facility" to "this facility".			
99.	Page WP 5-11, The ARARs for air are not mentioned.			
100.	Page WP 5-17, Sec. 5.2, Par. 1, 2, 3, and 4: The use of "operable unit" is confusing. The first paragraph states that the FS process for the 100 Areas will not be conducted on an operable unit basis while the second paragraph states that selected sites in the operable unit will have remedial action implemented. Also, it is not clear if one FS will be done for each 100 Area or if a focussed FS will be done at each site (solid wastes, soil, river sediments, groundwater, and 100-N Area). Part of the basis for streamlining remediation at Hanford is the use of LFIs, focussed feasibility studies, and IRMs. This process must be clear.			



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101.	Page WP 5-17, Sec. 5.2, Par. 4: The final ROD and the public notice process is described in detail while the public process for the IRM, which is the first step, is not adequately explained.		
102.	Page WP 5-18, Sec. 5.2.2, Par. 0: Four general tasks are identified but these tasks are difficult to find on Figure 6.2. The Feasibility Study tasks should be more specifically identified and numbered to facilitate tracking these tasks on the schedule. These tasks should be distinguished from the general 100-Area aggregate studies.		
103.	Page WP 5-18, Sec. 5.2.3: The focused feasibility study is difficult to follow on Figure 6.2.		
104.	Page WP 5-22, Sec. 5.2.3.5, Par. 4: The proposed remedial action plan is discussed, but the LRI is not discussed.		
105.	Page WP 6-1, Title: Title should be changed to "PROJECT SCHEDULE".		
106.	Page WP 6-1, Sec. 6.2: The reason for deleting assumptions should be given.		
107.	Page WP 6F-1, 6F-2, 6F-3, and 6F-4, Figures 6-1, 6-2, 6-3, and 6-4: All figures should have "100-BC-1 operable unit Remedial Investigation/Feasibility Study Work Plan" in figure title. When schedule figures from 100-BC-1 and 100-BC-2 work plans get mixed together, it is difficult to determine which figures go with which work plan.		

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108.	Page 6F-1, Figure 6-1: On the figure, the subtasks under Task 2, Task 5 and others should conform to list of subtasks provided in text of Chapter 5.0. For example, subtasks discussed in Chapter 5.0 for Task 2 include 2a - Source Data Compilation and Review, 2b - Geodetic Control, 2c - Field Activities, etc. All tasks except Task 6, Groundwater Investigations, are applicable to this operable unit. A time frame for performance of these tasks should be shown on the figure. If it is considered unnecessary to show performance periods for these tasks, the reasoning for the omission should be explained in a footnote. Showing the submittal dates of documents would be helpful. The footnote at bottom of figure does not seem technically correct. On "5.1.1 Mobilization" the bar chart shows approximately 5-6 weeks to mobilize (mid-August through Sept. 1992). Is it really going to take this long to mobilize to start field activities?			
109.	Page WP 7-2, Sec. 7.1.2.3, 7.1.2.4, and 7.1.2.5: The job position of Quality Assurance Officer, Quality Coordinator, and Health and Safety Officer are not referenced to Figure 7-1 (page WP 7F-1). These positions should be referenced and subsequently added to the figure, so as to be consistent with the remainder of Section 7.1.2.			
110.	Page WP 7-3, Sec. 7.1.2.9, Par. 1, Sen. 3: Do Figures 7-3 through 7-6 refer to organizational structures of Westinghouse Hanford Company (WHC) technical teams only, or do these figures depict the structure of RI/FS contractor terms under direction of the WHC Environmental Engineering Group? Please clarify the relationship in Section 7.1.2.9 and also in the four figures.			



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111.	Page WP 7.3, Sec. 7.1.2.9: Table 7.1 is not in the document.				
112.	Page WP 7-3, Sec. 7.2, Par. 2, Sen. 1: For clarity, the words "Tri-Party" should be inserted before the existing words "Action Plan".				
113.	Page WP 7-3, Sec. 7.3.1, Par. 3, Sen. 3: This sentence states that the management control system must meet the requirement of DOE Order 2250.1B (DOE 1985). However, Work Plan DOE/RL-90-08 states that the system must meet the requirement of DOE Order 2250.1C (DOE 1988b). This difference should be corrected or explained.				
114.	Page WP 7F-1, Figure 7-1: The word "Figures" in the lowermost box on the right is misspelled.				
115.	Pages WP 7F-3 and WP 7F-4: The word "Remedial" in the second box in the center is misspelled.				
116.	Pages WP 7F-3 through WP 7F-6: Modify the figure titles to show if these are WHC teams or RI/FS Contractor Teams.				
117.	Page WP 7T-1, Table 7-1: This page is missing from the document copy which was reviewed. (It is present in the DOE/RL-90-08 document.)				
118.	Appendix A: Quality assurance and quality control references should be upgraded from 1989 to 1991 where applicable, to conform to those stated in Work Plan DOE/RL-90-07, Draft B.				
119.	Page A-1, Sec. 1.3, Par. 1, Sen. 6: This sentence contains double parentheses.				
120.	Page A-3, Sec 3.0, Par. 2: The "goal" for the detection limits has not been established as required on p. 31 of the "Letter Report".				

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121.	Page A-8, Sec. 4.1.1: EIs should be initially defined.			
122.	Page B-3, Sec. 1.6: Should a sentence be added stating that contractor or subcontractor personnel regularly working at sites governed by an HWOP will undergo annual whole-body radiation scans?			
123.	Page B-9, Sec. 3.0, Par. 3, Sen. 2: Should the correct wording be "decommissioning" rather than commissioning?"			
124.	Page C-5, Table C-2: The work plans, that include the other tasks, are not identified in the table.			