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Department of Energy

Richland Operations Office
P.O. Box 550
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9202740

APR 20 1992



92-ERB-061

Mr. Paul T. Day
Hanford Project Manager
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

Mr. David B. Jansen, P.E.
Hanford Project Manager
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600



Dear Messrs. Day and Jansen:

RESPONSE TO THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY) AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S (EPA) REVIEW OF THE U-PLANT SOURCE AGGREGATE AREA MANAGEMENT STUDY REPORT (AAMSR) DRAFT A

This letter transmits the responses to comments received from Ecology and EPA on Draft A of the U-Plant AAMSR (M-27-02) (enclosure 1). The responses reflect clarification of the comments based on the March 24, 1992, meeting and the March 31, 1992, tele-conference. All comments except number 50 were agreed to. Comment 50 was dismissed by mutual agreement. A redlined version of the U-Plant Source AAMSR incorporating your comments is currently available. The U.S. Department of Energy, Richland Field Office (RL) requests a meeting be scheduled at your convenience as soon as practicable, to discuss the responses and review the redlined version of the U-Plant Source AAMSR. The final version of the U-Plant Source AAMSR will be released shortly after mutual agreement is reached on the redlined version.

The subject report is a secondary document; the responses are being transmitted to Ecology and EPA by the required date of April 18, 1992. This date represents the Hanford Federal Facility Agreement and Consent Order 30-day review/comment period extrapolated from Ecology's March 19, 1992, transmittal of their U-Plant AAMSR comments to RL (reference: Ecology ltr. to A. C. Harris from L. S. Goldstein "Ecology Review of U-Plant Source Aggregate Area Management Study (AAMS) Draft A," dtd. March 19, 1992).

Also included in this transmittal are the redlined versions of the U-Plant Source AAMSR Sections 1 and 9 (enclosure 2), distributed at the March 24, 1992, meeting; a draft U-Plant AAMSR Executive Summary (enclosure 3); and a draft March 31, 1992, tele-conference meeting minutes (enclosure 4).

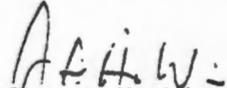
Messrs. Day and Jansen
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If you have any questions, please contact Mr. A. C. Harris at (509) 376-4339.

Sincerely,


Steven H. Wisness
Hanford Project Manager

ERD:ACH

Enclosures: As stated

cc w/encls:

D. Teel, Kennewick Ecology

cc w/o encls:

M. K. Harmon, EM-442

R. E. Lerch, WHC

T. B. Veneziano, WHC

ENVIRONMENTAL ENGINEERING AND GEOTECHNOLOGY
COMMENT RECORD FORM

1. Date 3/19/92 2. Page 1 of 30

3. Document Title/Number
U Plant Source Aggregate Area Management Study Report, DOE/RL-91-52, Draft A

4. Lead Engineer/Scientist M.J. Galgoul 5. Organization

6. Location/Phone/MSIN 450 Hills/376-2038/H4-55

7. Reviewer Ecology/EPA; letter L. Goldstein to A. Harris 8. Organization
Sign and Print Name Date

9. Location/Phone/MSIN

10 The document was reviewed, and the reviewer had no comments.

Reviewer _____ 11. Date

12 I have reviewed the disposition of comments with the Lead Engineer/Scientist.

Reviewer _____ 13. Date

14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
G1	There is no indication of whether limited field characterization activities were conducted to meet the objective to "conduct limited new site characterization work if data or interpretation uncertainty could be reduced by the work" (Section 1.3, page 1-8). For example, some of the unplanned releases (Table 5-1) are evaluated as low priority sites on the basis of hazard ranking scores (HRS). Limited field characterization data taken at these unplanned release locations might have helped to better support decisions for expedited, interim, or limited actions.	Accept. Limited Field Investigations are being conducted in support of the AAMS including spectral borehole and groundwater monitoring. Spectral borehole logging results will not be available to support source AAMSR but will be reported in separate topical reports and will be used to support future work plans (i.e., UP-2 O.U. Work Plan). Preliminary groundwater data will be used to support GW AAMSR and final results will be reported in a topical report. No characterization work was conducted to evaluate data uncertainties since no data were found that could be enhanced by additional field investigations within a time frame to support the AAMS.

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
G2	The criteria and rationale for the recommendations made in Section 9.0 need to be further developed. A more logical progression of data, analysis of data (including limitations and data needs) and final recommendations would provide better support for the recommendations.	Accept. Section 9.0 will be modified to include additional rationale.
G3	And All Subsequent pages: No schedules are provided for submittal of the work plans for the prioritized operable units. Also, there is no commitment nor schedules for conducting treatability studies for the recommended remedial technologies.	Accept. The schedule for UP-2 will be discussed. Although OUs are prioritized, schedules will not be developed until after all AAMSRs have been prepared. This will be addressed in the executive summary.
G4	The report appropriately references the draft <u>Hanford Site Baseline Risk Assessment Methodology</u> (Doe 1991) in several areas. However, the AAMS should follow accepted risk-based screening procedures, which are based on EPA Region 10 guidance (EPA 1991), when attempting to reduce the number of contaminants.	Accept. The AAMS did use the EPA guidance. The use of this guidance will be clarified in Section 4.2.
G5	The report focuses primarily on human exposure and resulting health effects. The AAMS must include additional information on ecological exposure and potential effects as specified in EPA (1989b, c).	Accept. No ecologic risk studies specific to waste management units or the Aggregate Area are available for assessing relative ecologic risks. Section 4 and 8 will be revised to clarify this data gap.
G6	There is little information provided in this report describing the interaction among various RL programs. The integration of RCRA, CERCLA, and D&D activities is critical to ensure timely and cost-effective program management.	Accept. The strategy for integrating the various RL programs is being formalized. The extent to which this strategy has been developed at this time will be discussed.
G7	The report often is written in the future tense, and leaves unanswered many specific questions concerning how, when, and by whom decisions will be made.	Accept. The tense in Section 1.0 and 9.0 has been revised to clarify whether work has been done or will be done. See Comment G3 for issues related to scheduling.

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
1.	<p>Section 1.2.2, page 1-6, second paragraph</p> <p>The text indicates Topical Reports will be based on information in WIDS. A great deal of WIDS information has already been summarized in the 200-UP-2 Operable Unit Work Plan, and this AAMS. New reports generated subsequent to this AAMS should be focused on satisfying specific data quality objectives, and should augment WIDS data. For example, compiling new data for operational histories and waste disposal records (see Sections 2.4 and 8.1.2).</p>	<p>Accept. Technical Baseline Reports which are considered topical reports precede the preparation of the AAMS. Section 1.0 has been clarified to reflect the correct tense.</p>
2.	<p>Section 1.4, page 1-9</p> <p>The text on quality assurance should also reference standard EPA guidance documents, e.g., <u>Contract Laboratory Program Statement of Work for Organic Analysis</u> (EPA 1988), and the <u>Quality Assurance Project Plan</u> being written for 100 Area work plans.</p>	<p>Accept. Quality Assurance documents will be referenced as appropriate in Section 1.4.</p>
3.	<p>Section 1.5, page 1-11</p> <p>The reference to Appendix D: "Data Management Plan" is misleading. This section of text is more appropriately titled, "Information Management Overview." This is consistent with how this information is being described in the 100 Area work plans.</p>	<p>Accept. Appendix D will be retitled.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
4.	<p>Section 2.3.1, page 2-4</p> <p>The text references the decommissioning and decontamination program without any explanation of what this program is, or when remediation will occur. Similarly, the text in Section 2.3.1.2.1, page 2-7, accurately refers to remediation of the 222-U laboratory under a "separate decommissioning and decontamination program," with no explanation.</p> <p>Coordination among various RI programs is critical to ensure integrated, mutually supportive and cost-effective remediation site-wide. An explanation of how the D&D program relates to remedial action under the <u>Hanford Federal Facility Agreement and Consent Order</u>, and how activities will be coordinated, would help clarify this issue.</p>	<p>Accept. Reference to "decommissioning and decontamination" program will be revised to Surplus Facility Program. A more detailed discussion of this program will be provided in Section 2.7.</p> <p>See General Comment G6.</p>
5.	<p>Section 2.3.1.1.2, page 2-7</p> <p>There are no data provided to support the assertion in this paragraph that only "Currently, noncorrosive steam condensate . . . goes through the 207-U basins and the 216-U-14 Ditch." Unless data are provided, this paragraph should be modified, and the report should describe when this data will be collected.</p>	<p>Accept. The assertion is based on stream specific reports which will be referenced in the text.</p>
6.	<p>Section 2.3.2, page 2-8, second paragraph</p> <p>The text should describe how the single-shell tank closure program is occurring under the auspices of RCRA, as provided for in the <u>Hanford Federal Facility Agreement and Consent Order</u>.</p>	<p>Accept. Will include text which describes the SST closure program.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
7.	<p>Section 2.3.2.1, page 2-9, second paragraph</p> <p>This paragraph should reference Table 2-5 for unplanned release data. Also, there is a discrepancy of 1,000 gallons between the text and Table 2-5, for the amount of bismuth phosphate leaked from the tank.</p>	<p>Accept. Table will be referenced and discrepancy will be resolved. Text will be changed to 30,000 gallons.</p>
8.	<p>Section 2.3.2.12, page 2-17, third paragraph</p> <p>The text states that the total volume believed to have leaked as 8,500 gallons, whereas Table 2-5 only notes the initial 500 gallon leak in 1969. Table 2-5 should be corrected. Also, the reference for unplanned releases should be corrected to read "Section 2.3.10." This correction also applies to the second paragraph on page 2-20.</p>	<p>Accept. Table will be revised to also reflect the total volume leaked. Reference will be corrected to read Section 2.3.10.</p>
9.	<p>Section 2.3.3.5, page 2-25</p> <p>This text on the 216-U-17 crib should be updated to include M-17 activities. Describe the resumption of flow to the crib that began 1/20/92, and is scheduled to cease 6/95; also describe the anticipated effluent quality and sampling requirements, e.g., <u>UO₂ Plant Process Condensate Effluent to 216-U-17 Sampling and Analysis Plan (WHC-SD-CD-PLN-11).</u></p>	<p>Accept. This text will be modified to include M-17 activities, and anticipated effluent quality from WHC-SD-CD-PLN-11.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
10.	<p>Section 2.3.3.7, page 2-25</p> <p>This text on the 216-Z-20 crib should be updated to describe M-17-16A activities.</p> <p>Given the information presented in this section, and the clear inclusion of this crib in the U Plant Aggregate Area, the rationale for <u>not</u> including the crib in planned investigations and remediation within this aggregate area should be explained.</p>	<p>Accept. Text will be updated to include M-17-16A activities. Additional rationale will be provided in Section 9.3 for taking the crib out of the 200-UP-1 OU and placing it into the 200-ZP-1 OU.</p>
11.	<p>Section 2.3.3.7, page 2-26, first paragraph</p> <p>The source(s) of data describing releases, leaks, and spills should be included in this paragraph.</p>	<p>Accept. The data will be researched to determine if a releasable source exists.</p>
12.	<p>Section 2.3.5.1, page 2-29</p> <p>The text describes the 216-U-10 Pond as being approximately 30 acres in size at its maximum, but gives no indication of what the status of the pond is today, e.g., is there any water left in the pond? What were the levels of surface radiation in 1990 that required two-feet of fill soil to be placed south of the pond? What are the data sources for "deactivation" activities?</p>	<p>Accept. The text will be clarified to show the pond is deactivated and dry. Data will be researched to determine if a releasable source exists.</p>
13.	<p>Section 2.3.9.2, page 2-43, second paragraph</p> <p>Is the <u>200-UP-2 Operable Unit Technical Report</u> (DeFord 1991) a Topical Report prepared for this study? This appears to be a key reference document.</p>	<p>Accept. The 200-UP-2 Technical Baseline Report was prepared to support the preparation of the 200-UP-2 Work Plan.</p>

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COMMENT RECORD FORM (cont.)

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
14.	<p>Section 2.3.10, page 2-43, second paragraph</p> <p>This paragraph raises of couple of interesting points. The statement concerning the need to compile more information is welcome, and noteworthy, since this "next step" data need is infrequently mentioned in Section 2.3.</p> <p>The text would be clarified by reference to Section 9.2.4.5. For example, the text states "a formal evaluation of the regulatory status of these (two) sites will be made." What does this mean? Are these the same sites already indicated for remediation under the RARA program in Section 9.2.4.5?</p>	<p>Section 2.3 refers to "new" suspect sites identified during the AAMS. These 2 "new" sites were not evaluated under the data evaluation process, but will be deferred until a formal evaluation is conducted. Text will be added to clarify which procedures will be followed.</p>
15.	<p>Section 2.6, page 2-48, second paragraph</p> <p>The text states the 216-U-12 crib is a TSD facility because of discharge of corrosive process condensate. The text should explain why this criterion isn't met for other cribs, e.g., the 216-U-12 crib was active post-November 1980 and likely received similar wastes. It appears that the 216-Z-19 ditch, active until September 1982, also should be classified as a RCRA past practice unit.</p> <p>The text also references closure of the 216-U-12 crib under RCRA. However, no information is provided to explain this "interaction." How will closure/post closure of this crib be coordinated with the investigation and remediation of other cribs in the aggregate area or operable units?</p>	<p>Accept. DOE is currently evaluating its position regarding reclassification of waste management units. However, such reclassification is outside the scope of the AAMS. Section 9.3.4 addresses the 216-U-12 crib and its interaction with past-practice activities.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
16.	<p>Section 2.7, page 2-49</p> <p>The text in this section is informative in mentioning other Hanford Programs, but says very little about how these programs "interact" to ensure integrated, mutually supportive and cost-effective compliance and remedial activities occur on a site-wide basis.</p>	<p>Accept. Please see response to Comment G6.</p>
17.	<p>Figures and Tables, pages 2F-1a to 2T-9b</p> <p>The figures and tables presented in this section are excellent, and should serve as a model for operable unit work plans and subsequent aggregate area reports.</p>	<p>Accept. The tables are being used in preparation of the 200-UP-2 Work Plan.</p>
18.	<p>Table 2-2, page 2T-2</p> <p>The 216-U-12 trench should be referenced by the same designation number as used in Section 2.3.5.1.6, i.e., 216-U-11. It also appears that the 216-Z-19 ditch is missing from this table.</p>	<p>Accept. Table will be clarified. 216-U-12 is a crib. There are no inventory data for the 216-Z-19 ditch, but it will be added to the table.</p>
19.	<p>Section 3.2.1, page 3-3</p> <p>The description of precipitation should include information concerning seasonal storm events. This would lead into a more detailed discussion in Sections 3.5.1 and 3.5.2.2 concerning the potential impact of stormwater runoff on recharge and the spread of contamination.</p>	<p>Accept. Additional information will be provided.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
20.	<p>Section 3.4.3.3, page 3-16</p> <p>The statement that the Plio-Pleistocene unit "is continuous in the U Plant Aggregate Area" appears misleading, and contradicts preceding text in this section which mentions the "good possibility" of erosional windows. Also, Section 2.3.3.1 describes gaps and transport through the caliche layer (of uranium) into the unconfined aquifer.</p>	<p>Accept. Section will be clarified to be made consistent.</p>
21.	<p>Section 3.5.1, page 3-19, fourth paragraph</p> <p>Did the research by Gee (1987) and Routson and Johnson (1990) include sampling during early spring storm events? Temperatures in February-March, for example, would seem to preclude much evapotranspiration.</p>	<p>Accept. The discussion of subject documents will be clarified with respect to the testing conditions. Additional information regarding the 100 year storm event will be also be included in the discussion.</p>
22.	<p>Section 3.6, pages 3-32 to 3-36</p> <p>There is a great deal of information presented in this section. Unfortunately, there are no references provided to simplify additional data collection.</p> <p>For example, it would be helpful for planning field work to know the location of sensitive or threatened flora. Reference is also made to badgers (Section 3.6.3.1) and harvester ants (Section 3.6.1.3.4), and data indicating these fauna can spread contamination. A key data objective for this and subsequent studies is to quantify environmental pathways; this report should consistently support satisfying this objective.</p>	<p>Accept. Please see response to Comment G5. No references are provided because this is original work created specifically for the AAMS by site biologists.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
23.	<p>Section 3.6.3, page 3-38</p> <p>The text notes there are no "domestic" groundwater supply wells within the aggregate area. Are there any public groundwater supply wells? The text should explain where on-site workers derive their potable water.</p> <p>The text also notes the nearest domestic well is over 20 miles distant from the study area. <u>The text should be modified.</u></p>	<p>Accept. Section will be clarified. Text will include a discussion of well 66-52-C at the PNL Observatory, well S28-E0 at the Training Academy and well 699-41900-C at the Yakima Barricade. The well designated as 699-24-95(4) is a seep well and will also be included.</p>
24.	<p>Section 4.1.1.2.1, page 4-4</p> <p>This section would be improved with a better attempt to make sense of what the data <u>do</u> indicate, with limitations, rather than explaining what they don't tell us. It is not clear, for example, why it is "nearly impossible" to convert gross gamma counts to a meaningful exposure rate due to "the complex distribution of radionuclides on the site."</p> <p>Within the context of surface soil radiological surveys, it may be true, as stated, that not all data will accurately describe surface conditions. But what is the point in making this distinction? Where, for example, are data on the "shallow buried radionuclides?"</p>	<p>Accept. Section will be clarified regarding usefulness of existing data. The text will indicate that the radiological survey technique provides an indication of both surface and subsurface contamination. Without direct sampling data to determine the location and speciation of contaminants, exposure calculations would be based on supposition. The data does however provide an indication of where additional sampling might be done to provide data required to calculate exposure rates.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
25.	<p>Section 4.1.1.2.2, page 4-6, first paragraph</p> <p>The text notes very high readings for the 216-U-Pond in 1985, with much lower readings in subsequent years. Data and citations would improve the value of this section. Section 4.1.1.2.1 also refers to the lower counts associated with Pond, but without providing any data. However, there was sufficient radioactivity just south of the Pond in 1990 to require a two-foot fill of clean soil (see Section 2.3.5.1).</p> <p>These concerns address not only the completeness of topics in this report, but more importantly, the data that needs to be presented. In this case, data and justification must be provided given the determination in Section 9.2.3.2 that insufficient data exists to conduct an IRM for the Pond.</p>	<p>Accept. Additional justification will be provided. All data that were available were provided in Draft A. Data will be researched to determine if releasable sources exist.</p>
26.	<p>Section 4.1.1.4, page 4-7, first paragraph</p> <p>It is stated that no upward trends in radionuclide concentrations were detected in wildlife species. In order for this information to be useful, baseline data must be presented, e.g., trends from what standard? Specific references should be provided to enable further research and field investigations.</p> <p>Are there statistically significant data to support the statement, "there are no statistically significant trends in vegetation radionuclide concentration since 1979?" If so, please provide some data and a citation. If not, the text should be modified.</p>	<p>Accept. Reference will be provided. Eberhardt et al. (1989).</p> <p>The 216-U-Pond will be reevaluated to assess whether an LFI is needed to support an IRM.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
27.	<p>Section 4.1.1.5, page 4-8, third paragraph</p> <p>The conclusion that only eight waste management units have the potential for contaminating the unconfined aquifer requires qualification. For example, it appears from Table 4-13 the 216-U-14, 216-Z-11, and 216-Z-19 ditches were not included in the calculations. Is this because there are no data on waste volume received in these units? Are there any empirical data to support the calculations? Also, it should be described how these determinations were used in making recommendations regarding LFIs and IRMs for these units.</p>	<p>Accept. Text will be clarified and table will be revised to include ditches. A footnote will be included on the table to indicate specific waste volume data not available for these sites. These determinations will not exclude sites while determining recommendations.</p>
28.	<p>Section 4.1.2.3.1, page 4-13, fourth paragraph</p> <p>The text refers to an "accident" that apparently flushed thousands of pounds of uranium into the aquifer. This unplanned release should be explained. It could be inferred from the data that this flushing action was the result of systematic discharge from the 221 and 224-U Plants. When did this accident occur? Are there calculations on how much uranium is left in the vadose zone?</p>	<p>Accept. Will clarify the discussion of the uranium releases and reference back to the more detailed discussion in 2.3.3. No specific calculations for uranium remaining in vadose zone are known.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
29.	<p>Section 4.1.2.3.7, page 4-14, third paragraph</p> <p>The data presented indicating no radionuclide contamination of groundwater is not conclusive. Does the linear regression, based on an average migration of 0.3-feet per year, assume homogeneity of the entire vadose zone? Where is the screened interval in this well? Are there more recent data to compare results?</p> <p>In general, when determinations or assumptions concerning the fate and transport of contaminants are based on historical data, there should be a reference to the 200 West Aggregate study, and a requirement that recent monitoring well data be used to test these assumptions.</p>	<p>Accept. The text will be modified to clarify the conclusion. Text will be added to indicate the basis for assumptions and their limitations. The reference will be cited.</p>
30.	<p>Section 4.1.2.5.1, pages 4-17 to 4-18</p> <p>The radionuclide data in this one section is presented in multiple units indicating activity and mass volume, e.g., ct/min, Pci/L, mrem/yr and ppm. Throughout this report, it would be helpful if conversions could be made where possible in order to simplify and make uniform data presentation.</p>	<p>Accept. Clarifying text will be added to provide comparison basis.</p>
31.	<p>Section 4.1.2.5.4, page 4-22, sixth paragraph</p> <p>The text notes that plutonium and americium were the most important radionuclides released to the 216-Z-ID ditch. How is "important" used in this context? A source for the data gathered in 1980 should be provided.</p>	<p>Accept. Text will be clarified and a releasable source added if available.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
32.	<p>Section 4.2, page 4-27, first paragraph</p> <p>The purpose of this section is to assess known data and develop a conceptual model on potential impacts to human health <u>and</u> the environment. This discussion presents only human exposure concerns. The text should also discuss potential ecological concerns and environmental pathways.</p>	<p>Accept. Text will be clarified to include ecological concerns and environmental pathways. No ecological risk studies specific to waste management units or the Aggregate Area are available for assessing relative ecologic risks. Sections 4 and 8 will be revised to clarify this data gap.</p>
33.	<p>Section 4.2, page 4-27, third paragraph</p> <p>Standard EPA risk assessment guidance documents, e.g., <u>Risk Assessment Guidance for Superfund</u>, should also be referenced in this paragraph.</p>	<p>Accept. Will reference appropriate EPA risk assessment guidance documents.</p>
34.	<p>Section 4.2.2, page 4-29, first paragraph</p> <p>Ingestion of soil (from fugitive dust or during characterization), direct contact with radionuclides, and uptake from contaminated biota through the foodchain should also be presented in this summary of transport pathways.</p>	<p>Accept. Will include subject items in Section 4.2.</p>
35.	<p>Section 4.2.2.2, page 4-33, third paragraph</p> <p>The conclusion that, "the contribution from the U Plant Aggregate Area to site-wide fugitive dust emissions is expected to be relatively minor" seems unsubstantiated and lacking purpose. It also appears contrary to the very high levels of surface radiation described in Section 4.1.1.2.1, and Figure 4-1, and fugitive dust control in the 216-U-14 Ditch. Please elaborate.</p>	<p>Accept. Appropriate reference basis for this statement will be provided. The 216-U-14 measures are undertaken as a proactive measure to control dust emissions.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
36.	<p>Section 4.2.2.4, page 4-34</p> <p>The acknowledgement in this section of major data gaps regarding biotic transport and environmental pathways should be clearly identified in Section 5.0 and addressed in Section 8.3.3.6. Where in this report are requirements to quantify environmental pathways?</p> <p>There are no data or references included in this discussion. A major purpose of this report is to define data needs and facilitate additional data compilation and field work.</p>	<p>Accept. Will provide additional text to discuss biota in Sections 4.0, 5.0, and 8.0. No ecological risk studies specific to waste management units or the Aggregate Area are available for assessing relative ecologic risks. Sections 4 and 8 will be revised to clarify this data gap.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
37.	<p>Section 4.2.4, page 4-36, first paragraph</p> <p>The rationale or reference for using the second criterion is not presented, and contaminants appear to be inappropriately eliminated by the use of one of the screening criteria (third bullet). These criteria are discussed below.</p> <p>The second criterion indicates that buildup of short-lived daughter radionuclide activity to a level of 1 percent or greater of the parent radionuclide activity causes the daughter to be included on the contaminant-of-concern list. However, the rationale or reference for this criterion is not included, and should be. If the parent activity is extremely high, 1 percent may not be a conservative screening level.</p> <p>The third criterion indicates that contaminants were placed on the contaminant-of-concern list if they are known or suspected carcinogens or have an EPA noncarcinogenic toxicity factor. It appears that contaminants not meeting such criteria are eliminated from the contaminant list. This screening fails to follow the contaminant screening process outlined in the DOE (1991) methodology. This criterion should be deleted.</p> <p>Missing from this list are references to regulatory standard, e.g., § 300.430(2), RCW 70.105, and 173-340 WAC. The risk assessment methodology for the Hanford site should be discussed and referenced in this.</p>	<p>Accept. The basis for this criterion will be modified and more clearly stated. Although daughter radionuclides are normally identified during the course of parent radionuclide investigations, they are also identified as contaminant of concerns through this criterion. This provides an additional level of assurance that all contaminants will be addressed.</p> <p>A statement will be included, similar to one in subsequent AAMS, that states contaminants without toxicity factors are included in the list if they have a recognized toxic effect.</p> <p>The reference and its secondary references will be discussed in the text.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
38.	<p>Section 4.2.4.3.1, page 4-39, fifth paragraph</p> <p>The text in this section and Table 4-28 should account for speciation of contaminants. For example, there is a major difference in the mobility and toxicity of arsenic depending on its valence state and ligands.</p>	<p>Accept. Text will be clarified to indicate the use of this Table is qualitative. Will discuss the influences of valence state and ligands on mobility and toxicity.</p>
39.	<p>Section 4.2.4.5.1, page 4-41, first paragraph</p> <p>The text states that generic and teratogenic effects generally occur at higher exposure levels than those required to induce cancer. The reference supporting this statement should be included.</p>	<p>Accept. The reference will be included.</p>
40.	<p>Section 4.2.4.5.1, page 4-42, second paragraph</p> <p>This paragraph discusses the excess cancer risks for exposure to radionuclide contaminants via various exposure pathways. The text should also discuss the use of slope factors in the determination of cancer risks and provide a reference for the slope factors.</p>	<p>Accept. Text will be modified to include this information.</p>
41.	<p>Section 4.2.4.5.1, page 4-42, third paragraph</p> <p>EPA guidance, e.g., <u>Risk Assessment Guidance for Superfund</u>, should also be referenced in this paragraph.</p>	<p>Accept. Appropriate EPA guidance will be referenced.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
42.	<p>Section 4.2.4.5.1, page 4-42, last paragraph</p> <p>The text states that EPA risk assessment guidance assumes exposure to multiple carcinogens resulting in effects that are additive without regard to target organ or cancer mechanism. The text should distinguish between radionuclide and nonradionuclide additivity. That is, risks from multiple radionuclides can be added together, and risks from nonradionuclides can be added together. However, risks from radionuclides and nonradionuclides should not be added together because of differing assumptions in the respective exposure assessment equations.</p> <p>A reference to 173-340-708(5)(6) WAC, for example, would enhance the regulatory context needed in making risk assessment determinations.</p>	<p>Accept. Comment noted. Details of the risk assessment approach are being developed in the M29-03 milestone (Hanford Baseline Risk Assessment Methodology). A reference to the risk assessment will be added.</p>
43.	<p>Section 4.2.4.5.2, page 4-43, second paragraph</p> <p>It is stated that many chemicals lacking toxicity criteria have "negligible toxicity or are necessary nutrients in the human diet." There is no citation provided for this assertion, and it is of questionable validity.</p> <p>Many trace metals are necessary in the human diet, and most are highly toxic, some acutely so, in sufficient levels. What is the point of this statement?</p>	<p>Accept. Text will be deleted. None of these chemicals were dropped from the contaminant of concern list for this reason.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
44.	<p>Section 4.2.4.5.1, page 4-42, third paragraph</p> <p>The text references the <u>Hanford Baseline Risk Assessment Methodology</u>, which proposes to use the dose conversion factors developed by the International Commission on Radiological Protection to calculate risk values when EPA slope factors are not available. However, this document also states that if a slope factor is not available, the EPA Office of Radiation Programs will be consulted and requested to develop the required slope factor. <u>This requirement should be mentioned in the text.</u></p>	Accept. Text will be modified.
45.	<p>Figure 4-3, page 4F-3</p> <p>The arrow leading from biota to humans (ingestion) should be deleted, unless the authors know something we don't!</p>	Accept. Figure will be modified.
46.	<p>Table 4-32, page 4T-32a</p> <p>This table appears to provide only human health effects information; the title of the table should reflect this. The table indicates the Integrated Risk Information System and the Registry of Toxic Effects of Chemical System (RTECS) were used for locating toxicity information. RTECS is not commonly used in a toxicity assessment. EPA (1989a), Chapter 7, Section 7.4, provides a list of resources that should be used for locating toxicological information. RTECS can be used, but only after resources included in EPA 1989A have been exhausted. In addition, a column should be included that provides the reference for each piece of data.</p>	Accept. Table will be modified. The reference for the toxicity information will be included for each entry in the table. The reference to RTEC is made because EPA 1989a does not provide information on Tributyl Phosphate.

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
47.	<p>Section 5.0, page 5-1</p> <p>The title of this section is "Health and Environmental Concerns," yet the entire section is devoted to describing human health only. Where is the discussion on environmental concerns?</p>	<p>Accept. No ecologic risk studies specific to waste management units or the Aggregate Area are available for assessing relative ecologic risks. Sections 4 and 8 will be revised to clarify this data gap.</p>
48.	<p>Section 5.1, page 5-2, first paragraph</p> <p>The title of this section, Conceptual Framework for Risk-based Screening, is misleading. The reader expects to find information on risk assessment screening procedures as outlined in EPA (1989a, 1991) guidance. What is presented is a discussion on general exposure pathways and an occupational exposure scenario. Therefore, a more appropriate title for this section is "Conceptual Framework for the Occupational Scenario."</p>	<p>Accept. Additional text will be provided to further describe the risk-based screening.</p>
49.	<p>Section 5.1, page 5-2, fourth paragraph</p> <p>The text should indicate that the occupational exposure scenario is most appropriate for identifying <u>current</u> health hazards associated with the U Plant Aggregate Area. Health hazards could change dramatically during investigation and remedial activities.</p>	<p>Accept. Text will be modified.</p>
50.	<p>Section 5.2.1, page 5-4, first paragraph</p> <p>It appears from the data presented that the 216-U-1 and 216-U-2 cribs, and the 216-U-10 Pond should be added to this list of high priority sites. Please clarify.</p>	<p>Reject. U-1 and U-2 cribs and the U-10 pond are on the list of high priority sites. No change in text will be made.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
51.	Section 5.3, page 5-7, third paragraph The acronym "ENS" should be defined.	Accept. Acronym will be defined or deleted.
52.	Table 5-1, page 5T-1a The table or accompanying text should define the column entitled Environmental Protection Score. The uranium contamination leak and paint waste spill sites do not have HRS or mHRS ratings. However, these sites were given a priority of "No." The rationale should be given in the text for giving these sites a priority of "No" when data are not available.	Accept. Table will be clarified. The two "new" suspect sites will be removed from the table (please see response to Comment 14).
53.	Section 6.4.2.3, page 6-18, third paragraph Washington state regulatory requirements are correctly noted in the first paragraph of this section. Therefore, the statement that "Ecology may require use of AKART," is misleading; this requirement isn't optional.	Accept. Text will be modified.
54.	Section 6.6, page 6-19, second paragraph Regulatory citations, for example, 173 340-720(6) WAC, would be helpful in this discussion of Point of Compliance.	Accept. Text will be clarified to refer to previous sections of Chapter 6.0.

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
55.	<p>Section 7.1 and 7.2, pages 7-2 to 7-4</p> <p>These sections would be improved if they were written based on the fundamental concepts in CERCLA § 121(b). This regulation requires the preference for isolation and/or permanent and significant reduction in volume, toxicity and mobility of hazardous substances. Missing from the text in the third paragraph on page 7-3 is the goal of isolation and permanence in the remedial action.</p> <p>For example, the text on page 7-4 implies that institutional controls will likely be a primary remedial measure, to the exclusion of treatment and isolation. As defined in § 300.430(a)(iii)(D), "the use of institutional controls should not substitute for active response measures."</p>	<p>Accept. Text will be modified to include discussion of recommended concepts. The use of institutional controls will be clarified, so they are not construed as a substitute for active response measures.</p>
56.	<p>Section 7.1, page 7-3, third paragraph</p> <p>The text discusses the media of concern for the U Plant Aggregate Area. The text should also discuss direct exposure to soils contaminated with nonradionuclides, and inhalation of particulates.</p>	<p>Accept. Text will be modified to discuss indicated routes of exposure.</p>
57.	<p>Section 7.4, pages 7-7 to 7-13</p> <p>The text in this section appears to lack a commitment to performing treatability tests in order to support recommended remedial technologies. This is a major deficiency that should be corrected.</p>	<p>Accept. Text will be modified to include discussion of treatability studies in alternatives, consistent with recommendations in Section 9. Additional detail regarding the scope of treatability studies will be added in Section 9.5.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
58.	<p>Section 8.2.1, page 8-13</p> <p>There is reference in this section to ecological risk, but without a commitment to gather biologic data. "Site characterization" generally refers to geologic, hydrologic and contaminant specific data. This section should address biotic data uses. A specific reference to M-29-03 would also help.</p>	<p>Accept. No ecological risk studies specific to waste management units or the Aggregate Area are available for assessing relative ecologic risks. Section 4 and 8 will be revised to clarify this data gap.</p>
59.	<p>Section 8.2.1, page 8-13, second paragraph</p> <p>The text references only Superfund risk assessment guidance produced by EPA headquarters for human health risk assessment. EPA Region 10 risk assessment guidance (EPA 1991) for human health should also be referenced, as should EPA guidance on ecological risk assessment (EPA 1989b, 1989c).</p>	<p>Accept. References will be added.</p>
60.	<p>Section 8.2.2.2, page 8-16</p> <p>This section should also incorporate the concepts and requirements defined in the <u>Quality Assurance Project Plan</u>. This generic document will be used in 100 Area investigations, and should be used in the 200 Area.</p>	<p>Accept. Text will be modified, adapted to the 200 Areas.</p>
61.	<p>Section 8.2.2.3, page 8-17, fourth paragraph</p> <p>The text notes that in the absence of data, an approach or rationale "will need to be developed to justify sampling locations and the number of samples selected." The text should describe when, how, and by whom this will occur.</p>	<p>Accept. Please see response to G3.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
62.	<p>Section 8.2.2.5, page 8-18, second paragraph</p> <p>This paragraph raises interesting points that we look forward to discussing in greater detail.</p> <p>The statement that analysis of arsenic to much lower levels is "impossible because of limitations of analytical methods" should be explained. Most CLP procedures, e.g., Method 200.62-C-CLP, can analyze to 500 ppb. However, we agree that background levels may make this point moot.</p>	Accept. Explanation will be provided.
63.	<p>Section 8.3.3.3, page 8-25</p> <p>Reference should be made to the UO₃ Plant stabilization activity defined in the M-17-19, and the sampling requirements contained therein.</p>	Accept. The reference and sampling requirements contained therein will be added to the discussion.
64.	<p>Section 8.3.3.6, page 8-26, first paragraph</p> <p>The ecological investigation discussion should include a statement that the information obtained through ecological investigation activities will be used to refine the conceptual model and in the ecological risk assessment.</p>	Accept. Statement will be added.

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
65.	<p>Section 9.0, page 9-2, third paragraph</p> <p>The text states that all recommendations for future characterization needs will be fully developed in the RFI/CMS. This statement is contrary to the <u>Hanford Past Practice Strategy</u>, which emphasizes LFIs in order to provide data necessary to make IRM decision. Section 8.3.3 correctly lists field investigations being undertaken primarily as LFIs and IRMs, and "possibly some RIs."</p>	<p>Accept. Text will be clarified so that it does not preclude options identified in the Hanford Site Past-Practice Strategy. We will delete RI/FS (RFI/CMS) and add "through work plans which may be operable unit (geographically) based or based on LFIs or IRMs (specific waste management units or groups of waste management) future work plans will focus on the sampling rational and approved.</p>
66.	<p>Section 9.1, page 9-2, fourth paragraph</p> <p>The relationship between Imminent and Substantial Endangerment (ISE) and Expedited Response Actions (ERA) should be discussed within a regulatory context. An ISE has a specific regulatory meaning, whereas ERAs at the Hanford Site have occurred without determining an ISE situation exists.</p>	<p>Accept. ISE will be removed as a criterion.</p>
67.	<p>Section 9.1, page 9-3, first paragraph</p> <p>The text in this paragraph implies a degree of certainty for making recommendations that is inconsistent with numerous paragraphs describing data limitations. See, for example, the last paragraph in Section 8.1.4.</p> <p>This designation process should be expressed in very preliminary terms. What data, for example, were used to eliminate waste management units? The HRS ranking system data are extremely limited, and address essentially radioactivity only. The mHRS system is not approved by EPA or Ecology.</p>	<p>Accept. Text will be revised to describe the context for screening decisions within the AAMS reports.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
68.	<p>Section 9.1.1, page 9-4</p> <p>This section should be examined to check for consistency with the <u>Hanford Past Practice Strategy - "Programmatic Decisions,"</u> and EPA (1991b). Expedited Response Actions are undertaken to protect public health and the environment. These criteria are lost in this discussion.</p>	<p>Accept. Please see response to Comment 67. The term imminent and substantial endangerment has been removed. The criteria contained in the Hanford Site Past Practice Strategy has been included.</p>
69.	<p>Section 9.1.1, page 9-4, second paragraph</p> <p>The rationale for using 100 times the CERCLA reportable quantity or 100 times the most applicable standard for a particular constituent when determining whether a site warrants an expedited response action (ERA) should be provided. It should be noted that this criterion is applicable under 173-340 WAC for soils only.</p>	<p>Accept. Text will be revised to describe the context for screening decisions within the AAMS reports.</p>
70.	<p>Section 9.1.1, page 9-5, first through third paragraphs</p> <p>The first paragraph describes criteria that are vague, confusing, and appear inconsistent with § 300.415 criteria. Availability of resources, for example, is not a criterion for justifying an ERA, and should be deleted.</p>	<p>Accept. Change "whether ERAs are justified" to "the conduct of ERAs."</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
71.	<p>Section 9.1.2, page 9-6, first paragraph</p> <p>We agree that grouping of sites can be an effective way to reduce characterization requirements. The risk inherent in this approach is the assumption that similar units have received the same quantity and quality of wastes, and that all units have the same potential for causing adverse environmental effects. The data do not support this concept of homogeneity.</p> <p>The text in Section 9.2.3.1, page 9-12, brings other criteria into consideration, and expresses a justified conservative approach. Consider moving this paragraph into this section, or modify this section to address this qualification.</p>	<p>Accept. Text will be moved.</p> <p>Accept. There is risk inherent in grouping sites. The rationale and justification for grouping similar units for characterization or remediation purposes will be more fully developed in work plans. This approach is consistent with HPPS.</p>
72.	<p>Section 9.1.2, page 9-6, fourth paragraph</p> <p>Availability of resources is not a criterion for justifying an IRM, and should be deleted.</p>	<p>Accept. Please see response to Comment 70.</p> <p>Change "on whetherjustified" to "regarding the conduct of IRMs in the U Plant AA"</p>
73.	<p>Section 9.1.3, page 9-7, third paragraph</p> <p>What regulatory authority allows a "no further action" recommendation for sites believed to be remediated, but the "location of the contamination is no longer known?" Who determines when a site is officially "lost."</p>	<p>Accept. "No further action" recommendations have been deleted. UPRs will be investigated in the final remedy selection path.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
74.	<p>Section 9.2.1, page 9-7</p> <p>The text notes the 2607-W5 Septic Tank "was" recommended for an ERA. Where in the text is this recommendation made? For example, previous text in Sections 2.3.6.1 and 4.1.2.6 give no indication this tank and drain field present any notable human or environmental health problem. The information needed to justify this recommendation is finally provided in Section 9.2.1.1.</p> <p>In general, a re-ordering of text, with an emphasis on providing important information as early as possible in the report, e.g., Sections 2.3 and 4.1, would provide a more logical progression of data, analysis, and recommendations.</p>	<p>Accept.</p> <p>Section 9.0 is intended to discuss recommendation. Additional clarification for this recommendation will be provided.</p> <p>Text follows the outlined defined TPA.</p>
75.	<p>Section 9.2.2, page 9-10, fourth paragraph</p> <p>The text notes there are 24 IRM candidate sites with inadequate data to meet an IRM designation. Twenty will remain as IRM candidates. What is the status of the other four sites?</p>	<p>Accept. Text will be clarified to indicate the status of these sites.</p>
76.	<p>Section 9.2.3.2, page 9-13, first paragraph</p> <p>The linkage between this section and data presented in Section 2.3.5.1 seems to be missing. Some sites identified in earlier sections appeared to have sufficient data to recommend an IRM, e.g., 216-Z-19 ditch, but were not. There should be a summary of information and rationale in this section, and Section 9.2.3.1, to enable the reader to understand how and why these recommendations have been made.</p>	<p>Accept. Justification for recommendations will be provided.</p> <p>The sufficiency of data to support IRMs directly will be reevaluated.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
77.	<p>Section 9.3.2, page 9-18</p> <p>The rationale for removing investigation of groundwater and the 200 West Area groundwater operable unit from the scope is not provided, and should be.</p> <p>Similarly, no reason is provided for including the 216-U-14 ditch and 207-U retention basin in the 200-UP-1 operable unit rather than the 200-UP-2 operable unit. The agencies need to resolve the classification of these units and identify how and when they will be remediated prior to the final draft of this report. Please see, Ecology letter dated March 14, 1992, regarding classification of the 216-U-14 Ditch.</p> <p>A list of high-level waste transfer facilities and pipelines to be removed from the work scope of the 200-UP-1 and 200-UP-2 operable units is not provided, and should be.</p> <p>As mentioned in Comment #10, no explanation is provided for including the 216-Z-20 crib in the Z plant AAMS. Similarly, why is there a recommendation to place the 216-S-4 french drain and the 216-S-21 in the S plant AAMS for the 200-UP-1 operable unit?</p>	<p>Accept. Justification for recommendations that involve reassignment of waste management units will be provided.</p> <p>Text will be clarified to indicate that these facilities are not (and have never been) within the scope of UP-1 and UP-2. These facilities are in the operational program or the Single-Shell Tank program.</p> <p>Justification for recommendations that involve reassignment of waste management units will be provided.</p>

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14. Item	15. Comment(s) (Provide technical justification for the comment and proposed action to correct or resolve the comment.)	16. Disposition (Provide brief justification if NOT accepted.)
78.	<p>Figure 9-1, page 9F-1</p> <p>This data evaluation flow chart should have explanatory text, best located in Section 9.2. It should be noted this chart is not intended to be comprehensive, for example, it does not include administrative requirements such as the Proposed Plan and public involvement prior to undertaking an IRM.</p>	<p>Accept. Text will be added to Section 9.1, where the explanatory text for Figure 9-1 is currently located.</p>
79.	<p>Table 9-1, page 9T-1a</p> <p>The candidate ERA sites recommended for evaluation and implementation under the Radiation Area Remedial Action program should be listed in this table under a separate column. Also, the table should include the corresponding operable unit for each waste site.</p>	<p>Accept. Table will be clarified.</p>
80.	<p>Section 10.0, page 10-4</p> <p>References should be included for EPA (1989b, 1991).</p>	<p>Accept. References will be added.</p>

9212541.0-4

1.0 INTRODUCTION

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2
3
4 The U.S. Department of Energy (DOE) Hanford Site in Washington State is organized
5 into numerically designated operational areas including the 100, 200, 300, 400, 600, and
6 1100 Areas (Figure 1-1). The U.S. Environmental Protection Agency (EPA), in November
7 1989, included the 200 Areas of the Hanford Site on the National Priorities List (NPL)
8 under the Comprehensive Environmental Response, Compensation and Liability Act
9 (CERCLA) of 1980. Inclusion on the NPL initiates the Remedial Investigation (RI) and
10 Feasibility Study (FS) process for characterizing the nature and extent of contamination,
11 assessing risks to human health and the environment, and selection of remedial actions.
12

13 This report presents the results of an aggregate area management study (AAMS) for the
14 U Plant Aggregate Area located in the 200 Areas of the U.S. Department of Energy (DOE)
15 Hanford Site in Washington State. The study will provide the basis for initiating RI/FS
16 under CERCLA or under the Resource Conservation and Recovery Act (RCRA) Facility
17 Investigations (RFI) and Corrective Measures Studies (CMS). This report also integrates
18 RCRA treatment, storage or disposal (TSD) closure activities with CERCLA and RCRA past
19 practice investigations.
20

21 This chapter describes the overall AAMS approach for the 200 Areas, defines the
22 purpose, objectives and scope of the AAMS, and summarizes the quality assurance (QA)
23 program and contents of the report.
24

25 26 1.1 OVERVIEW

27
28 ~~The 100, 200, 300, and 1100 Areas have been listed on the EPA's NPL.~~ The 200
29 Areas, located near the center of the Hanford Site, encompasses the 200 West, East and
30 North Areas which contain reactor fuel processing and waste management facilities.
31

32 Under the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party
33 Agreement), signed by the Washington State Department of Ecology (Ecology), DOE, and
34 EPA (Ecology et al. 1990), the 200 NPL Site encompasses the 200 Areas and selected
35 portions of the 600 Area. The 200 NPL Site is divided into 8 waste area groups largely
36 corresponding to the major processing plants (e.g., B Plant and T Plant), and a number of
37 isolated operable units located in the surrounding 600 Area. Each waste area group is
38 further subdivided into one or more operable units based on waste disposal information,
39 location, facility type, and other site characteristics. The 200 NPL site includes a total of 44
40 operable units including 20 in the 200 East Area, 17 in the 200 West Area, 1 in the 200
41 North Area, and 6 isolated operable units. The intent of defining operable units was to

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1 group associated waste management units together, such that they could be effectively
2 characterized and remediated under one work plan.
3

4 The Tri-Party Agreement also defines approximately 25 RCRA TSD groups within the
5 200 Areas which will be closed or permitted (for operation or postclosure care) in
6 accordance with the Washington State Dangerous Waste Regulations (WAC 173-303). The
7 TSD facilities are often associated with an operable unit and are required to be addressed
8 concurrently with past-practice activities under the Tri-Party Agreement.
9

10 This AAMS is one of ten studies that will provide the basis for past practice activities
11 for operable units in the 200 Areas. In addition, the AAMS will be collectively used in the
12 initial development of an area-wide groundwater model, and conduct of an initial site-wide
13 risk assessment. Recent changes to the Tri-Party Agreement (Ecology et al. 1991), and the
14 *Hanford Past-Practice Strategy* document (Thompson 1991) establish the need and provide
15 the framework for conducting AAMS in the 200 Areas.
16

17 18 **1.1.1 Tri-Party Agreement** 19

20 The Tri-Party Agreement was developed and signed by representatives from the EPA,
21 Ecology, and DOE in May 1989, and revised in 1990 and 1991. The scope of the agreement
22 covers all CERCLA past practice, RCRA past practice, and RCRA TSD activities on the
23 Hanford Site. The purpose of the Tri-Party Agreement is to ensure that the environmental
24 impacts of past and present activities are investigated and appropriately remediated to protect
25 human health and the environment. To accomplish this, the Tri-Party Agreement provides a
26 framework and schedule for developing, prioritizing, implementing and monitoring
27 appropriate response actions.
28

29 The 1991 revision to the Tri-Party Agreement requires that an aggregate area approach
30 be implemented in the 200 Areas based on the *Hanford Past-Practice Strategy* (Thompson
31 1991). This strategy requires the conduct of AAMS which are similar in nature to an RI/FS
32 scoping study. The Tri-Party Agreement change package (Ecology et al. 1991) specifies that
33 10 Aggregate Area Management Study Reports (AAMSR) (major milestone M-27-00) are to
34 be prepared for the 200 Areas. Further definition of aggregate areas and the AAMS
35 approach is provided in Sections 1.2 and 1.3.
36
37

38 **1.1.2 Hanford Site Past Practice Strategy** 39

40 The *Hanford Past-Practice Strategy* was developed between Ecology, EPA, and DOE
41 to streamline the existing RI/FS and RFI/CMS processes. A primary objective of this

1 strategy is to develop a process to meet the statutory requirements and integrate CERCLA
2 RI/FS and RCRA Past Practice RFI/CMS guidance into a singular process for the Hanford
3 Site that ensures protection of human health and welfare and the environment. The strategy
4 refines the existing past practice decision-making process as defined in the Tri-Party
5 Agreement. The fundamental principle of the strategy is a bias-for-action by optimizing the
6 use of existing data, integrating past practice with RCRA TSD closure investigations,
7 focusing the RI/FS process, conducting interim remedial actions, and reaching early
8 decisions to initiate and complete cleanup projects on both operable-unit and aggregate-area
9 scale. The ultimate goal being is the comprehensive cleanup or closure of all contaminated
10 areas at the Hanford Site at the earliest possible date in the most effective manner.

11
12 The process under this strategy is a continuum of activities whereby the effort is
13 defined based upon knowledge gained as work progresses. Whereas the strategy is intended
14 to streamline investigations and documentation to promote the use of interim actions to
15 accelerate cleanup, it is consistent with RI/FS and RFI/CMS processes. An important
16 element of this strategy is the application of the observational approach, in which
17 characterization data are collected concurrently with cleanup.

18
19 For the 200 Areas the first step in the strategy is the evaluation of existing information
20 presented in AAMSR. Based on this information, decisions ~~will be~~ are made regarding
21 which strategy path(s) to pursue for further actions in the aggregate area. The strategy
22 includes three paths for interim decision making and a final remedy-selection process that
23 incorporates the three paths and integrates sites not addressed in those paths. As shown on
24 Figure 1-2, the three paths for decision making are the following:

- 25
26
- 27 • Expedited response action (ERA) path, where an existing or near-term
28 unacceptable health or environmental risk from a site is determined or suspected,
29 and a rapid response is necessary to mitigate the problem
 - 30 • Interim remedial measure (IRM) path, where existing data are sufficient to
31 indicate that the site poses a risk through one or more pathways and additional
32 investigations are not needed to screen the likely range of remedial alternatives
33 for interim actions; if a determination is made that an IRM is justified, the
34 process ~~will~~ proceeds to select an IRM remedy and ~~may include~~ a focused FS, if
35 needed, to select a remedy
 - 36 • Limited field investigation (LFI) path, where minimum site data are needed to
37 support IRM or other decisions, and ~~can be~~ is obtained in a less formal manner
38 than that needed to support a final Record of Decision (ROD). ~~It may be~~
39 determined that ~~d~~Data generated from a LFI is may be sufficient to directly
40

1 support an interim ROD. Regardless of the scope of the LFI, it is a part of the
2 RI process, and not a substitute for it.
3

4 The process of final remedy selection must be completed for the aggregate area to
5 reach closure. The aggregation of information obtained from LFI and interim actions may be
6 sufficient to perform the cumulative risk assessment and to define the final remedy for the
7 aggregate area or associated operable units. If the data are not sufficient, additional
8 investigations and studies will be performed to the extent necessary to support final remedy
9 selection. These investigations would be performed within the framework and process
10 defined for RI/FS or RFI/CMS programs.
11

12 1.2 200 NPL SITE AGGREGATE AREA MANAGEMENT STUDY PROGRAM

13 The overall approach and scope of the 200 Areas AAMS program is based on the Tri-
14 Party Agreement and the *Hanford Past-Practice Strategy*.
15

16 1.2.1 Overall Approach

17 As defined in the 1991 revision to the Tri-Party Agreement, the AAMS program for
18 the 200 Areas consists of conducting a series of ten AAMS for eight source (Figures 1-3 and
19 1-4) and two groundwater aggregate areas delineated in the 200 East, West, and North
20 Areas. Table 1-1 lists the aggregate areas, the type of study and associated operable units.
21 With the exception of 200-IU-6, isolated operable units associated with the 200 NPL site
22 (Figure 1-5) are not included in the AAMS program. Generally, the quantity of existing
23 information associated with isolated operable units is not considered sufficient to require
24 study on an aggregate area basis prior to work plan development. Operable unit 200-IU-6
25 will be addressed as part of the B Plant AAMS because of similarities in waste
26 management units (i.e., ponds).
27

28 The eight source AAMS are designed to evaluate source terms on a plant-wide scale.
29 Source AAMS will be conducted for the following aggregate areas (waste area groups)
30 which largely correspond to the major processing plants including the following:
31

- 32 • U Plant
- 33 • Z Plant
- 34 • S Plant
- 35
- 36
- 37
- 38
- 39
- 40
- 41

- 1 • T Plant
- 2
- 3 • PUREX
- 4
- 5 • B Plant
- 6
- 7 • Semi-Works
- 8
- 9 • 200 North.
- 10

11 The groundwater beneath the 200 Areas will be investigated under two groundwater
12 AAMS on an Area-wide scale (i.e., 200 West and 200 East Areas). Groundwater aggregate
13 areas were delineated to encompass the geography necessary to define and understand the
14 local hydrologic regime, and the distribution, migration and interaction of contaminants
15 emanating from source terms. ~~which is~~ The groundwater aggregate areas are considered an
16 appropriate scale for developing conceptual and numerical groundwater models.
17

18 The U.S. Department of Energy, Richland Operations Field Office (DOE-RL) functions
19 as the "lead agency" for the 200 AAMS program. Depending on the specific AAMS, EPA
20 and/or Ecology function as the "Lead Regulatory Agency" (Table 1-1). Through periodic
21 (monthly) meetings information is transferred and regulators are informed of the progress of
22 the AAMS such that decisions established under the *Hanford Past-Practice Strategy* (e.g., is
23 an ERA justified?) (Figure 1-2) can be quickly and collectively made between the three
24 parties. These meetings will continually refine the scope of AAMS as new information is
25 evaluated, decisions are made and actions taken. Completion milestones for AAMS are
26 defined in Ecology et al. (1991) and duplicated in Table 1-1. All AAMSR will be
27 submitted as Secondary Documents which are defined in the Tri-Party Agreement as
28 informational documents.
29

30 31 1.2.2 Process Overview

32 Each AAMS ~~will be conducted in~~ consists of three steps: 1) the analysis of existing
33 data and formulation of a preliminary conceptual model, 2) identification of data needs and
34 evaluation of remedial technologies, and 3) conduct of limited field characterization activities
35 and report preparation. Steps 1 and 2 are components of an AAMSR. Step 3 is a parallel
36 effort for which separate reports will be produced.
37

38
39 The first and primary task of the AAMS investigation process involves the search,
40 compilation and evaluation of existing data. Information that ~~will be~~ collected for these
41 purposes includes the following:

- 1 • Facility and process descriptions and operational histories for waste sources
2
3 • Waste disposal records defining dates of disposal, waste types, and waste
4 quantities
5
6 • Sampling events of waste effluents and effected media
7
8 • Site conditions including the site physiography, geology, hydrology, meteorology,
9 ecology, demography, and archaeology
10
11 • Environmental monitoring data for affected media including air, surface water,
12 sediment, soil, groundwater and biota.
13

14 Collectively this information ~~will be~~ is used to identify contaminants of concern,
15 determine the scope of future characterization efforts, and to develop a preliminary
16 conceptual model of the aggregate area. Although data collection objectives are similar, the
17 types of information collected ~~will~~ depend on whether the study is a source or groundwater
18 AAMS. The data collection step serves to avoid duplication of previous efforts and
19 facilitates a more focused investigation by the identification of data gaps.
20

21 Topical reports referred to as Technical Baseline Reports ~~will be~~ are initially prepared
22 to summarize facility information. These reports ~~will~~ describe individual waste management
23 units and unplanned releases contained in the aggregate area as identified in the Waste
24 Information Data System (WIDS) (WHC 1991a). The reports are based on review of current
25 and historical Hanford Site reports, engineering drawings and photographs and are
26 supplemented with site inspections and employee interviews. Information contained in the
27 reports ~~will be~~ is summarized in the AAMSR. Other topical reports are used as sources of
28 information in the AAMSR. These reports are as follows:
29

- 30 • U Plant Geologic and Geophysics Data Package
31
32 • Z Plant Geologic and Geophysics Data Package
33
34 • S Plant Geologic and Geophysics Data Package
35
36 • T Plant Geologic and Geophysics Data Package
37
38 • PUREX Geologic and Geophysics Data Package
39
40 • B Plant Geologic and Geophysics Data Package
41

- 1 • 200 N Geologic and Geophysics Data Package
- 2
- 3 • Semiworks Geologic and Geophysics Data Package
- 4
- 5 • Geologic and Geophysics Data Packages
- 6
- 7 • Hydrologic Model for the 200 West Groundwater Aggregate Area
- 8
- 9 • Hydrologic Model for the 200 East Groundwater Aggregate Area
- 10
- 11 • Unconfined Aquifer Hydrologic Test Data Package for the 200 West
- 12 Groundwater Aggregate Area
- 13
- 14 • Unconfined Aquifer Hydrologic Test Data Package for the 200 East Groundwater
- 15 Aggregate Area
- 16
- 17 • Confined Aquifer Hydrologic Test Data Package for the 200 Groundwater
- 18 Aggregate Area Management Studies
- 19
- 20 • Groundwater Field Characterization Report
- 21
- 22 • 200 West Area Borehole Geophysics Field Characterization
- 23
- 24 • 200 East Area Borehole Geophysics Field Characterization
- 25

26 The general scope of the topical reports related to this AAMSR is described in Section
 27 8.0. ~~Generally, other topical reports will be generated for environmental monitoring or~~
 28 ~~sampling data which have not been previously compiled or summarized, or when existing~~
 29 ~~reports are outdated or inadequate.~~

30
 31 Information on waste sources, pathways, and receptors ~~will be~~ is used to develop a
 32 preliminary conceptual model of the aggregate area. In the preliminary conceptual model,
 33 the release mechanisms and transport pathways are identified. If the conceptual
 34 understanding of the site is considered inadequate, limited field characterization activities can
 35 be undertaken as part of the study. Field screening activities ~~planned under~~
 36 occurring in parallel with and as part of the AAMS process include the following:

- 37
- 38 • Expanded groundwater monitoring programs (non Contract Laboratory Program)
- 39 at approximately 80 select existing wells to identify contaminants of concern and
- 40 refine groundwater plume maps
- 41

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- 1 • In situ assaying of gamma-emitting radionuclides at approximately 10 selected
2 existing boreholes per aggregate area to develop radioelement concentration
3 profiles in the vadose zone.
4

5 Wells, boreholes, and analytes ~~will be~~ are selected based on a review of existing
6 environmental data which ~~will be~~ is undertaken early in the AAMS process. Field
7 characterization results will be presented later in topical reports.
8

9 After the preliminary conceptual model is developed, health and environmental
10 concerns are identified. The purpose of this determination is to provide one basis for
11 determining recommendations and prioritization for subsequent actions at waste management
12 units. ~~preliminary~~ Potential applicable or relevant and appropriate requirements (ARARs)
13 and potential remedial technologies ~~will be~~ are identified. In cases where the existing
14 information is sufficient, the *Hanford Past-Practice Strategy* allows for a focused FS or CMS
15 to be initiated prior to the completion of the study.
16

17 Data needs ~~will be~~ are identified by evaluating the sufficiency of existing data and by
18 determining what additional data are necessary to adequately characterize the aggregate area,
19 refine the preliminary conceptual model and potential ARARs, and/or narrow the range of
20 remedial alternatives. Determinations ~~will be~~ are made regarding the level of uncertainty
21 associated with existing data and the need to verify or supplement the data. If additional data
22 are needed, the intended data uses ~~will be~~ are identified, data quality objectives (DQO)
23 established and data priorities set.
24

25 Each AAMSR ~~will~~ results in management recommendations for the aggregate area
26 including the following:
27

- 28 • The need for ERA, IRM, and LFI or whether to retain in the final remedy
29 selection path
30
31 • Definition and prioritization of operable units
32
33 • Prioritization of work plan activities
34
35 • Integration of RCRA TSD closure activities
36
37 • The conduct of field characterization activities
38
39 • The need for treatability studies.
40

- Identification of waste management units addressed entirely under other operational programs

The waste management units recommended for ERA, IRM, or LFI actions are considered higher priority units that require rapid response. Lower priority waste management units will generally follow the conventional process for RI/FS. In spite of this distinction in the priority of sites, RI/FS activities will be conducted for all the waste management units. In the case of the higher priority waste management units, rapid response operations will be followed by conventional RI/FS activities, although these activities may be modified because of knowledge gained through the remediation activities. In the case of the lower priority waste management units, an area-wide RI/FS will be prepared which encompasses these sites.

Based on the AAMSR, a decision is made on whether the study has provided sufficient information to forego further field investigations and prepare a FS. ~~If further field investigations are required,~~ an RI/FS work plan (which may be limited to LFI activities) is- will be developed and executed. ~~The scope of future work plans will be largely limited to that of a sampling and analysis plan.~~ The background information normally required to support the preparation of a work plan (e.g., site description, conceptual model, DQO, etc.) is developed in the AAMSR and can be referenced accordingly. The future work plans will reference information from the AAMSR. They will also include the rationale for sampling and analysis, will present detailed, unit-specific DQO, and will further develop physical site models as the data allows. In some cases, there may be insufficient data to support any further analysis than is provided in the AAMSR, so an added level of detail in the work plan may not be feasible.

All ten AAMS are scheduled to be completed by September 1992. This will facilitate a coordinated approach to prioritizing and implementing future past practice activities for the entire 200 Areas.

1.3 PURPOSE, SCOPE, AND OBJECTIVES

The purpose of conducting an AAMS is to compile and evaluate the existing body of knowledge and conduct limited field characterization work to support the *Hanford Past-Practice Strategy* decision making process for an aggregate area. The AAMS process is similar in nature to the RI/FS scoping process prior to work plan development and is intended to maximize the use of existing data to allow a more limited and focused RI/FS. Deliverables for an AAMS consist of the AAMSR and health and safety, project management, and data management plans.

1 Specific objectives of the AAMS include the following:

- 2
- 3 • Assemble and interpret existing data including operational and environmental data
- 4
- 5 • Describe site conditions
- 6
- 7 • Conduct limited new site characterization work if data or interpretation
- 8 uncertainty could be reduced by the work
- 9
- 10 • Develop a preliminary conceptual model
- 11
- 12 • Identify contaminants of concern, and their distribution
- 13
- 14 • Identify preliminary potential ARARs
- 15
- 16 • Define preliminary remedial action objectives, screen potential remedial
- 17 technologies, and if possible provide recommendations for focused FS
- 18
- 19 • Recommend treatability studies to support the evaluation of remedial action
- 20 alternatives
- 21
- 22 • Define data needs, establish general DQO and set data priorities
- 23
- 24 • Provide recommendations for expedited, interim or limited ERA, IRM, LFI or
- 25 other actions
- 26
- 27 • Redefine and prioritize, as data allow, operable unit boundaries
- 28
- 29 • Define and prioritize, as data allow, work plan and other past practice activities
- 30 with emphasis on supporting early cleanup actions and records of decisions
- 31
- 32 • Integrate RCRA TSD closure activities with past practice activities.
- 33

34 Information on single-shell and double-shell tanks is presented in Sections 2.0 and 4.0.

35 The AAMSR is not intended to address remediation related to the tanks. Nonetheless, the

36 tank information is presented because known and suspected releases from the tanks may

37 influence the interpretation of contamination data at nearby waste management units.

38 Information on other facilities and buildings is also presented for this same reason. However

39 because these structures are addressed by other programs, the AAMSR does not include

40 recommendations for further action at these structures.

41

1 Depending on whether an aggregate area is a source or groundwater aggregate area, the
2 scope of the AAMS will vary. Source AAMS focus on source terms, and the
3 environmental media of interest include air, biota, surface water, surface soil, and the
4 unsaturated subsurface soil. Accordingly, detailed descriptions of facilities and operational
5 information are provided in the source AAMS. In contrast, groundwater AAMS focus on
6 the saturated subsurface and on groundwater contamination data. Descriptions of facilities in
7 the groundwater AAMS are limited to liquid disposal facilities and reference is made to
8 source AAMS for detailed descriptions. The description of site conditions in source
9 AAMS concentrate on site physiography, meteorology, surface water hydrology, vadose
10 zone geology, ecology, and demography. Groundwater AAMS summarize regional
11 geohydrologic conditions and contain detailed information regarding the local geohydrology
12 on an Area-wide scale. Correspondingly, other sections of the AAMS vary depending on
13 the environmental media of concern.
14

16 1.4 QUALITY ASSURANCE

17
18 A limited amount of field characterization work will be performed as part in parallel
19 with preparation of the AAMS report. To help ensure that data collected are of sufficient
20 quality to support decisions, all work on the Hanford Site is subject to the requirements of
21 DOE Order 5700-1A, Quality Assurance (DOE RL 1983), which establishes broadly
22 applicable QA program requirements in compliance with American National Standards
23 Institute/American Society of Mechanical Engineers QA guidelines (ANSI/ASME 1989); the
24 QA program requirements so defined apply to all types of project activities conducted on the
25 Hanford Site.
26

27 To ensure that the objectives of the past practice activities are met in a manner
28 consistent with DOE RL Order 5700-1A (DOE RL 1983), Quality Assurance, all work will
29 be performed in compliance with Westinghouse Hanford's existing QA manual, WHC-CM-4-
30 2 (WHC 1988a) and with procedures outlined in the QA program plan, WHC-EP-0383
31 (WHC 1990a) specific to CERCLA RI/FS activities. This QA program plan describes the
32 various plans, procedures, and instructions that will be used by Westinghouse Hanford to
33 implement the QA requirements of DOE RL Order 5700-1A.
34

36 1.5 ORGANIZATION OF REPORT

37
38 In addition to this introduction, the AAMS will consist of the following nine sections
39 and appendices:
40

- 1 • Section 2.0, Facility, Process and Operational History Descriptions, describes the
2 major facilities, waste management units and unplanned releases within the
3 aggregate area. A chronology of waste disposal activities is established and waste
4 generating processes are summarized.
5
- 6 • Section 3.0, Site Conditions, describes the physical, environmental, and
7 sociological setting including, geology, hydrology, ecology, meteorology, and
8 demography.
9
- 10 • Section 4.0, Preliminary Conceptual Model, summarizes the conceptual
11 understanding of the aggregate area with respect to types and extent of
12 contamination, exposure pathways and receptors.
13
- 14 • Section 5.0, Health and Environmental Concerns, identifies chemicals used or
15 disposed within the aggregate area that could be of concern regarding public
16 health and/or the environment and describes and applies the screening process for
17 determining the relative priority of follow-up action at each waste management
18 unit.
19
- 20 • Section 6.0, Potentially Applicable or Relevant and Appropriate Requirements,
21 identifies federal and state standards, requirements, criteria, or limitations that
22 may be considered relevant to the aggregate area.
23
- 24 • Section 7.0, Preliminary Remedial Action Technologies, identifies and screens
25 potential remedial technologies and establishes remedial action objectives for
26 environmental media.
27
- 28 • Section 8.0, Data Quality Objectives, reviews QA criteria on existing data,
29 identifies data gaps or deficiencies, and identifies broad data needs for field
30 characterization and risk assessment. The DQO and data priorities are
31 established.
32
- 33 • Section 9.0, Recommendations, provides guidance for future past practice
34 activities based on the results of the AAMS. Recommendations are provided for
35 ERA at problem sites, IRM, LFI, refining operable unit boundaries, prioritizing
36 work plans, and conducting field investigations and treatability studies.
37
- 38 • Section 10.0, References, list reports and documents cited in the AAMSR.
39 • Appendix A, Supplemental Data, provides supplemental data supporting the
40 AAMSR.
41

1 The following plans are included and will be used to support past practice activities in
2 the aggregate area:

- 3
- 4 • Appendix B: Health and Safety Plan
 - 5
 - 6 • Appendix C: Project Management Plan
 - 7
 - 8 • Appendix D: Data Management Plan
 - 9

10 Community relations requirements for the U Plant Aggregate Area can be found in the
11 *Community Relations Plan for the Hanford Federal Facility Agreement and Consent Order*
12 (Ecology et al. 1989).
13

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9.0 RECOMMENDATIONS

1
2
3
4 The purpose of the aggregate area management study (AAMS) is to compile and evaluate the
5 existing body of knowledge to support the ~~Hanford Past-Practice Investigation Strategy~~ (Thompson
6 1991) decision making process. A primary task in achieving this purpose is to assess each waste
7 management unit and unplanned release within the aggregate area to determine the most expeditious
8 pathway for remediation within the statutory requirements of the Comprehensive Environmental
9 Response, Compensation and Liability Act (CERCLA) and Resource Conservation Recovery Act
10 (RCRA). The existing body of pertinent knowledge regarding U Plant Aggregate Area waste
11 management units and unplanned releases has been summarized and evaluated in the previous sections
12 of this study. A data evaluation process has been established that uses the existing data to develop
13 preliminary recommendations on the appropriate remediation ~~process-pathway~~ for each site. This data
14 evaluation process is a refinement of the ~~Hanford Past-Practice Investigation Strategy~~ (Figure 1-2) and
15 establishes criteria for selecting appropriate ~~Hanford Past-Practice Investigation Strategy~~ pathways
16 (expedited response action, ERA; interim remedial measures, IRM; limited field investigation, LFI;
17 and final remedy selection) for individual waste management units and unplanned releases within the
18 200 Areas. A discussion of the criteria for pathway selection and the results of the data evaluation
19 process are provided in Section 9.1. and 9.2, respectively. Figure 9-1 provides a flowchart of the
20 data evaluation process that will be discussed. Tables 9-1 and 9-2 provide a summary of the results
21 of the data evaluation assessment of each unit and the decisional matrix patterns each unit followed.
22

23 This section presents recommended assessment paths for the waste management units and
24 unplanned releases at the U Plant Aggregate Area. These recommendations are only proposed at this
25 time and are subject to adjustment and change. Factors that may affect development of final
26 recommendations include, but are not limited to, comments and advice from the U.S. Environmental
27 Protection Agency (EPA), Washington State Department of Ecology (Ecology), or U.S. Department
28 of Energy (DOE); identification and development of new information; and modification of the criteria
29 used in the assessment path decision-making process. Changes in recommendations will be
30 addressed, and more detail on recommended assessment paths for waste management units and
31 unplanned releases will be included in work plans as they are developed for the actual investigation
32 and remediation activities.
33

34 A majority of waste management units and unplanned releases do not have information
35 regarding the nature and extent of contamination necessary for quantitative or qualitative risk
36 assessment, especially with regard to hazardous constituents, and were recommended for additional
37 investigation (e.g., LFI). One unit, a septic tank and drain field, was recommended for an ERA and
38 corrective action, if required, to assess whether the liquid discharged to the system is mobilizing
39 contamination beneath the 216-U-1 and 216-U-2 Cribs. Several units and releases assessed within the
40 ERA pathway were recommended for actions that fall within the scope of existing operational
41 programs. Wooden cribs with collapse potential and sites with elevated levels of surface radionuclide
42 contamination were recommended for fall within inclusion in the Radiation Area Remedial Action
43 (RARA) program. ~~No further action was recommended for an unplanned release site that had been
44 cleaned up after the release and for which the location can no longer be determined.~~
45

1 Waste management units and unplanned releases which will be dispositioned dealt with entirely
2 by other programs were not subjected to the data evaluation eriteria process. This includes units and
3 unplanned release which are within the scope of the Single-Shell Tank Program, Surplus Facilities
4 Program, and Defense Waste Management Program.

5
6 A majority of facilities addressed included in the data evaluation fall within the scope of the Single-
7 Shell Tank Program. The activities associated with closure of the 200-UP-3 Operable Unit single-shell
8 tank sites have separate Hanford Federal Facility Agreement and Consent Order (Tri-Party
9 Agreement) milestones and any recommendations for disposition of these units and associated
10 unplanned releases will be developed as part the ongoing program addressing the single-shell tanks.
11 The units associated with the 200-UP-3 Operable Unit that were not evaluated include single-shell
12 tanks and associated diversion boxes, vaults, catch tanks, and high-level waste transfer lines.

13
14 ~~One hundred forty two million liters of single shell tank wastes are stored in 149 single shell~~
15 ~~tanks in the 200 Areas. Safety concerns are being evaluated and corrective actions formulated.~~
16 ~~Characterization is being performed in support of tank safety, remediation, interim stabilization, and~~
17 ~~isolation, as well as closure planning. After the single shell tank wastes are placed in a safe interim~~
18 ~~storage configuration, the single shell tank operable units will be closed under the National~~
19 ~~Environmental Policy Act (NEPA)/environmental impact statement (EIS) and RCRA closure~~
20 ~~processes. New technology is needed to support each major step in this process.~~

21
22 ~~Since the activities associated with closure of the 200-UP-3 Operable Unit single shell tank sites~~
23 ~~are extensively covered by a separate program and separate Hanford Federal Facility Agreement and~~
24 ~~Consent Order (Tri-Party Agreement) milestones, recommendations for disposition of these units and~~
25 ~~associated unplanned releases will not be included in the aggregate area management study report~~
26 ~~(AAMSR).~~

27
28 A discussion of the four decision-making paths shown on Figure 9-1: ERA, IRM, LFI, and
29 final remedy selection, is provided in Section 9.1. Section 9.2 provides a discussion of the waste
30 management units grouped under each of these paths. A discussion of regrouping and prioritization
31 of the waste management units is provided in Section 9.3. Recommendations for redefining operable
32 unit boundaries and prioritizing operable units for work plan development is-are also provided in
33 section 9.3. No additional aggregate area-based field characterization activities are recommended to
34 be undertaken as a continuation of the AAMS. All recommendations for future characterization needs
35 (see Section 8.0) will be more fully developed and implemented through the remedial investigation
36 (RI)/feasibility study (FS) (RCRA Facility Investigation (RFI)/Corrective Measures Study [CMS])
37 work plans. Sections 9.4 and 9.5 provide recommendations for focused feasibility and treatability
38 studies, respectively.

39 40 41 9.1 DECISION MAKING CRITERIA

42
43 The criteria used for assessing the most expeditious remediation process pathway are based
44 primarily on urgency for action and whether site data are adequate to proceed along a given pathway
45 (Figure 9-1). All units and unplanned releases that are not completely addressed under other Hanford

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1 Site programs are assessed in the data evaluation process. All of the units and releases that are
2 addressed in the data evaluation process have been initially evaluated as candidates for an ERA.
3 Sites where a release has occurred or is imminent ~~become~~ are considered candidates for ~~an~~ ERAs.
4 Conditions that might trigger an ERA are the determination of an unacceptable health or
5 environmental risk or a short time frame available to mitigate the problem (Thompson 1991). ~~For the~~
6 ~~purpose of this evaluation, this trigger implies imminent and substantial endangerment.~~ As a result,
7 candidate ERA units were evaluated against a set of criteria to determine whether ~~imminent and~~
8 ~~substantial endangerment to human health or the environment~~ potential for exposure to unacceptable
9 health or environmental risks exists. Units and unplanned releases that are recommended for ERAs
10 will undergo a formal evaluation following the selection process outlined in WHC (1991b).
11

12 Waste management units and unplanned releases that are not recommended for an ERA
13 continue through the data evaluation process. Sites continuing through the process that potentially
14 pose a high risk (refer to Section 5.0), become candidates for an IRM. The criteria used to determine
15 a potential for high risk, thereby indicating a high priority site, were the Hazard Ranking System
16 (HRS) score used for nominating waste management units for CERCLA cleanup (40 CFR 300), the
17 modified Hazard Ranking System (mHRS) scores, surface radiation survey data, and rankings by the
18 Environmental Protection Program (Huckfeldt 1991b). Units and unplanned releases with HRS or
19 mHRS scores greater than 28.5 (the CERCLA cleanup criterion) were designated as candidate IRM
20 sites. Units and unplanned releases that did not have an HRS score were compared to similar sites to
21 establish an estimated HRS score. Sites with surface contamination greater than 2 mR/h exposure
22 rate, 100 ct/min beta/gamma above background or alpha greater than 20 ct/min were also designated
23 as candidate IRM sites. In addition, surface contamination sites which had an Environmental
24 Protection Program ranking of greater than 7 were ~~further also~~ designated as candidate IRM sites.
25 The candidate IRM sites are listed in Table 5-1, which summarizes the high priority sites. Candidate
26 IRM sites were then further evaluated to determine if an IRM is appropriate for the site. Candidate
27 IRM sites that did not meet the IRM criteria were placed into the final remedy selection pathway.
28

29 For certain units and unplanned releases, it was recognized that remedial actions could be
30 undertaken under an existing operational or other Hanford Site program (e.g., Single-Shell Tank,
31 RARA, or Surplus Facility programs). As a result, recommendations were made that remedial
32 actions be undertaken (partially or completely) outside the 200 AAMS past practice program. Units
33 or unplanned releases that could be addressed only in part by another program (e.g., surface
34 contamination cleanup under the RARA program) remained in the 200 AAMS data evaluation process
35 for further consideration. If it cannot be demonstrated that these sites will be addressed under the
36 operational program within a time frame compatible with the past practice program, they will be
37 readdressed by the 200 AAMS process.
38

39 Units and unplanned releases recommended for complete disposition under another program
40 (e.g., single-shell tanks and associated structures under the Single-Shell Tank program) were not
41 considered in the 200 AAMS data evaluation process. In addition, potentially new sites that were
42 identified during the AAMS were also not considered. It is recommended that a formal determination
43 be made regarding the regulatory status of all new sites following established procedures before they
44 are considered further under the 200 AAMS data evaluation process. Potentially new sites identified
45 in the U Plant Aggregate Area are described in Section 2.3.10.

1 Specific criteria used to develop initial recommendation for EPA ERA, LFI, and IRM for units
2 and unplanned releases within the aggregate area are provided in Sections 9.1.1 and 9.1.2. Units and
3 unplanned releases not initially addressed under an ERA, LFI or IRM will be first evaluated under the
4 final remedy selection pathway discussed in Section 9.1.3.
5

6 7 9.1.1 Expedited Response Action Pathway 8

9 Candidate ERA sites are evaluated to determine if they pose an ~~imminent and substantial~~
10 ~~endangerment to human health or the environment~~ unacceptable health or environmental risk. All
11 units and unplanned releases other than those recommended for complete disposition under another
12 Hanford program are assessed against the ERA criteria. The Hanford Past-Practice Strategy describes
13 conditions that might trigger abatement of a candidate waste management unit or unplanned release
14 under an ERA. Generally, these conditions would rely on a determination of, or suspected, existing
15 or future unacceptable health or environmental risk, and a short time-frame available to mitigate the
16 problem. Conditions include, but are not limited to:

- 17
- 18 • Actual or potential exposure to nearby human populations, biota, or the food chain from
19 hazardous substances and radioactive or mixed waste contaminants
 - 20
 - 21 • Actual or potential contamination of drinking water supplies or sensitive ecosystems
22
 - 23 • Threats of release of hazardous substances and radioactive or mixed waste contaminants
24
 - 25 • High levels of hazardous substances and radioactive or mixed waste contaminants in soils
26 that pose or may pose a threat to human health or the environment, or have the potential
27 for migration
 - 28
 - 29 • Weather conditions that may increase the potential for release or migration of hazardous
30 substances and radioactive or mixed waste contaminants
 - 31
 - 32 • The availability of other appropriate federal or state response mechanisms to respond to
33 the release
 - 34
 - 35 • Time required to develop and implement a final remedy
36
 - 37 • Further degradation of the medium which may occur if a response action is not
38 expeditiously initiated
 - 39
 - 40 • Risks of fire or explosion or potential for exposure as a result of an accident or failure of
41 a container or handling system
 - 42
 - 43 • Other situations or factors that may pose threats to human health or welfare or the
44 environment.
 - 45

1 These conditions were used as the initial screening criteria to identify candidate waste
2 management units and unplanned releases for ERAs. Candidate waste management units and releases
3 that did not meet these conditions were not assessed through the ERA evaluation path. Additional
4 criteria for further, detailed screening of ERA candidates were developed based on the conditions
5 outlined in the Hanford Past-Practice Strategy. These additional screening criteria are implicit in
6 Figure 9-1 and are described below.

7
8 The ~~initial-next~~ criterion used to assess the ~~unit or unplanned release~~ each ERA candidate is
9 whether a driving force to an exposure pathway exists or is likely to exist. Units or unplanned
10 releases with contamination that is migrating or is likely to significantly migrate to a medium that can
11 result in exposure and harm to humans required additional assessment under the ERA process. Units
12 or unplanned releases where contamination could ~~spread-migrate~~ and, therefore, potentially require
13 significantly more extensive remedial action if left unabated were also assessed in the ERA pathway.

14
15 Waste management units and unplanned releases with a driving force were assessed to
16 determine if ~~substantial-endangerment-unacceptable health or environmental risk~~ exists from the
17 release. The criteria used to determine "~~substantial~~" ~~unacceptable~~ are based on the quantity and
18 ~~quality-concentration~~ of the release. If the release or imminent release is greater than 100 times the
19 CERCLA reportable quantity for any constituent, the unit or unplanned release ~~will-remain~~ in
20 consideration for an ERA. If the release or imminent release contains hazardous constituents at
21 concentrations that are 100 times the most applicable standard, the unit or unplanned release continues
22 to be considered for an ERA. In some cases, engineering judgment was used to estimate the quantity
23 and ~~quality-concentration~~ of a postulated release. Standards applied include Model Toxics Control
24 Act (MTCA) standards for industrial sites and U.S. Department of Energy and Westinghouse Hanford
25 Company radiation criteria (refer to Section 6.0). The application of these standards does not signify
26 they are recognized as ARARs.

27
28 If a release is ~~imminent-and-substantial unacceptable~~ with respect to ~~health or environmental~~
29 ~~risk~~, a technology must be readily available to control the release for a unit or unplanned release to be
30 considered for an ERA. An example that would require substantial technology development before
31 implementation of cleanup would be a tritium release since no established ~~control-treatment~~
32 technology is available ~~for-to~~ separate low concentrations of tritium ~~separation from water~~.

33
34 ~~Another criterion for an ERA is to determine whether implementation of the available~~
35 ~~technology would have adverse consequences that would offset the benefits of an ERA. Examples of~~
36 ~~adverse consequences include: technologies where the exposure to cleanup personnel would pose a~~
37 ~~much greater risk than the release; the ERA would foreclose future remedial actions; or the ERA~~
38 ~~would prevent or greatly hinder future data collection activities. If adverse consequences are not~~
39 ~~expected to be present then the site remained in consideration for an ERA.~~

40
41 The next step in the ERA evaluation path involves determining whether implementation of the
42 available technology would have adverse consequences that would offset the benefits of an ERA.
43 Examples of adverse consequences include: (1) use of technologies that result in risks to cleanup
44 personnel that are much greater than the risks of the release; (2) the ERA would foreclose future

1 remedial actions; and (3) the ERA would prevent or greatly hinder future data collection activities. If
2 adverse consequences are not expected, the site remains in consideration for an ERA.

3
4 The final criterion is to determine if the candidate ERA is within the scope of an operational
5 program. Maintenance and operation of active waste management facilities are within the scope of
6 activities administered by the Defense Waste Management Program. Active facilities include certain
7 transfer lines, diversion boxes, the 241-UX-302 Catch Tank, the 244-U Receiver Tank, the 216-U-17
8 Crib, the 216-Z-20 Crib, and the 216-U-14 Ditch. Generally, active facilities will not be included in
9 past practice investigations unless operation is discontinued prior to initiation of the investigation.
10 The Surplus Facilities and RCRA Closures program is responsible for safe and cost-effective
11 surveillance, maintenance, and decommissioning of surplus facilities and RCRA closures at the
12 Hanford Site. The Surplus Facilities program is also responsible for RARA activities that include
13 surveillance, maintenance, decontamination, and/or stabilization of inactive burial grounds, cribs,
14 ponds, trenches, and unplanned release sites.

15
16 If the proposed ERA will not address all the contamination present, the unit or unplanned
17 release continues through the process to be evaluated under a second pathway. For example, surface
18 contamination cleanup under the RARA program is an example where initial cleanup may not address
19 subsurface contamination and, therefore, additional investigation may be needed.

20
21 Final decision regarding whether ERAs are justified in the aggregate area will be made between
22 the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the
23 Washington Department of Ecology (Ecology) based, at least in part, on the recommendations
24 provided in this section, results of the final selection process outlined in WHC (1991b), and
25 availability of resources.

26 27 28 9.1.2 Limited Field Investigation and Interim Remedial Measure Pathway

29
30 High priority waste management units and unplanned release sites were evaluated to determine
31 if sufficient need and information exists such that an IRM could be pursued. An IRM is desired for
32 high priority units and unplanned releases where extensive characterization is not necessary to reach a
33 defensible cleanup decisions. Implementation of ~~an IRM-IRMs at waste management units and~~
34 ~~unplanned releases~~ with minimal characterization is expected to rely on observational data acquired
35 during remedial activities. Successful execution of this strategy is expected to reduce both time and
36 cost for cleanup of units and unplanned releases without impacting the effectiveness of the
37 implemented action.

38
39 The initial step in the IRM ~~assessment process evaluation path~~ is to categorize the units. The
40 exposure pathways of interest are similar for each site in a category; therefore, it is effective to
41 evaluate candidate units as a group. The groupings used in Section 2.3 (e.g., cribs; tanks and vaults;
42 etc.) will continue to be used to group the units for IRM assessment. This grouping ~~units approach~~ is
43 especially effective ~~to~~ in reducing characterization requirements. The LFIs can be used to
44 characterize a representative unit or units in detail to develop a remedial alternative for the group of

1 units. Observational data obtained during implementation of the remedial alternative could be used to
2 meet unit specific needs.
3

4 Data adequacy is assessed in the next step. The existing data were are evaluated to determine
5 if: 1) existing data were sufficient to develop a conceptual model and qualitative risk assessment; 2)
6 the IRM will work for this pathway; 3) implementing the IRM will have adverse impacts on the
7 environment, future remediation activities or data collection efforts; 4) the benefits of implementing
8 the IRM are greater than the costs. If data are not adequate an assessment was made to determine if
9 an LFI might provide enough data to perform an IRM. If an LFI would not collect sufficient data to
10 perform an IRM, the unit was addressed in the final remedy selection pathway.
11

12 The final step in the IRM evaluation process is to assess if the IRM will work without
13 significant adverse consequences. This includes: will the IRM be successful? will it create significant
14 adverse environmental impacts (e.g., environmental releases)? will the costs outweigh the benefits?
15 will it preclude future cleanup or data collection efforts? and will the risks of the cleanup be greater
16 than the risks of no action? Units where remediation is considered to be possible without adverse
17 consequences outweighing benefits of the remediation are recommended for IRMs.
18

19 Final decisions will be made between DOE, EPA, and Ecology on whether particular IRMs are
20 justified based, to least in part, on the recommendation provided in this AAMSR, results of a
21 supporting LFI, and availability of resources.
22

23 9.1.3 Final Remedy Selection Pathway 24

25 Sites recommended for initial consideration in the final remedy selection pathway are those not
26 recommended for IRMs, LFIs, or ERAs or were and those considered to be low priority sites. It is
27 recognized that all units and unplanned releases within the operable unit or aggregate area will
28 eventually be addressed collectively under the final remedy pathway to support a final Record of
29 Decision (ROD). For the purposes of this discussion, RI/FS and the RFI/CMS processes are
30 synonymous; therefore, RI/FS will be used throughout this discussion to represent either the
31 CERCLA or RCRA investigation past practices process.
32
33

34 The initial step in the final remedy selection process pathway is to assess whether the combined
35 data from the AAMS, and any completed ERAs, IRMs, and LFIs are adequate for performing a risk
36 assessment (RA) and selecting a final remedy. Whereas the scope of an ERA, IRM, and LFI is
37 limited to individual waste management units or groups of similar waste management units, the final
38 remedy selection pathway will likely address an entire operable unit or aggregate area.
39

40 If the data are collectively sufficient, an operable unit or aggregate area RA will be performed.
41 If sufficient data are not available, additional needs will be identified and collected.
42

43 No further action is recommended for those sites that were remediated in the past but have no
44 coordinates for their location. An example of such a site is an unplanned release along a road during
45 the transport of radioactive materials (i.e. UN 200 W 46). If the contaminated segment of road is

1 cleaned to background radiation levels in the area and the location of the contamination is no longer
2 known, then the site will be recommended for no further action.
3

4 5 9.2 PATHWAY RECOMMENDATIONS 6

7 Initial recommendations for ERA, IRM, and LFI are discussed in Section 9.2.1 through 9.2.3,
8 respectively. Sites Waste management units and unplanned releases proposed for initial consideration
9 under the final remedy selection pathway are discussed in Section 9.2.4. Table 9-1 provides a
10 summary of the data evaluation process path assessment. A summary of the responses to the decision
11 points on the flowchart that led to the recommendations is provided in Table 9-2. Sites recommended
12 for no further action are proposed in Section 9.2.5. Following approval by DOE, EPA, and Ecology,
13 these recommendations will be further developed and implemented in work plans. Finally, Section
14 9.2.6 provides recommendations for interations treatment, storage, or disposal (TSD) facility closures
15 with past practices activities.
16

17 18 9.2.1 Proposed Sites for Expedited Response Actions 19

20 Several units were evaluated along the ERA pathway. Ten waste management units and
21 unplanned releases meet all the criteria for an ERA prior to determining whether the proposed action
22 was within the scope of an operational program. One unit, 2607-W5 Septic Tank and Drain Field
23 was recommended for an ERA. Six candidate ERA units (cribs with collapse potential and surface
24 contamination sites) were recommended for disposition under the RARA program. Three active
25 waste management units receiving liquid discharges were evaluated as candidate ERA units. The
26 active units were recommended for disposition under an ongoing Defense Waste Management
27 program to discontinue discharges from liquid effluent to the soil column. A discussion of the
28 recommendations for these sites is waste management units are included in this section. Since the
29 anticipated response actions are not expected to fully remediated the ERA sites, all sites-units will be
30 included for further assessment in the remaining pathways data evaluation in the assessment paths.
31

32 9.2.1.1 Sites Potentially Causing Subsurface Contaminant Migration. The 2607-W-5 Septic Tank
33 and Drain Field is located about 50 m (164 ft) from the center of the 216-U-1 and 216-U-2 Cribs.
34 Approximately 12 m³ of water per day gal are said to be discharged to the drain field. There is thus
35 a significant flux of water through the vadose zone beneath the site. This water could be remobilizing
36 vadose zone contamination that originated at the cribs. This problem may be especially significant in
37 the perched water zone above the Plio-Pleistocene caliche layer. At this location, there can be
38 significant lateral movement of vadose zone water. The septic system could be flushing uranium
39 contaminated water that is more than 100 times the reportable quantity and the quality standards into
40 the underlying aquifer.
41

42 The 2607-W-5 Septic Tank and Drain Field should be investigated to determine if deactivation
43 is necessary. The volume of water flowing to the facility needs to be confirmed. If the value is
44 significant an investigation needs to be made to determine if the liquid is flushing contaminants
45 beneath the 216-U-1 and 216-U-2 Cribs. If it is, the crib should be deactivated. A LFI is

1 recommended for this site after the ERA has been completed to assess if hazardous contamination has
2 been discharged to the site.
3

4 9.2.1.2 Cribs With Collapse Potential. Four of the older cribs are open wooden structures that could
5 collapse and potentially expose workers. A sudden collapse could bring contaminated dust from the
6 buried crib to the surface. Based on crib inventory data, dust derived from the bottom of the cribs
7 would be expected to contain radionuclides at several orders of magnitude above reportable quantities
8 and quality standards. Cribs 216-S-21, 216-U-1 and 216-U-2, and 216-U-8 all have potential collapse
9 problems. An interim stabilization ~~plan is being implemented~~ has been completed for the area
10 surrounding the 216-U-1 and 216-U-2 Cribs.
11

12 Maintenance and contamination control measures for cribs with collapse potential are
13 implemented under ~~an operational program; the RARA program~~. Therefore, ~~interim actions to~~
14 mitigate environmental releases from these facilities will be ~~deferred to performed under~~ the RARA
15 program. An engineering study is planned under the RARA program for 1993 to evaluate the
16 potential for crib collapse ~~for 200 Area cribs~~.
17

18 Response actions such as the addition of clean fill material over the cribs or pressure grouting
19 void areas within the crib to prevent collapse may be considered for these ~~sites~~ waste management
20 units. Evaluation and recommendation of response actions for these facilities will be performed under
21 the RARA program.
22

23 9.2.1.3 Active Waste Management Units. Three active liquid effluent units operate within the U
24 Plant Aggregate Area, 216-U-14 Ditch, 216-U-17 Crib, and 216-Z-20 Crib. Operation of these
25 facilities provides a potential for migration of radioactive contaminants to the groundwater. Efforts
26 are currently underway to evaluate an alternative that could be implemented that would result in
27 deactivation of three facilities by June 1995. In the interim, hazardous wastes will not be discharged
28 to these units. Evaluation and deactivation of these facilities will remain with the ongoing program
29 and will not be included as part of the past practices investigation. In addition, investigation of
30 contamination associated with the facilities will be deferred until after deactivation of the facilities.
31

32 9.2.1.4 Sites With Significant Surface Contamination. There are five sites with levels of surface
33 contamination that are high enough to be of immediate concern. Surface contamination is
34 immediately accessible to humans (i.e., workers) and biota. The potential for transport by the wind
35 or biota is also significant and so surface migration is also a problem. It is expected that the releases
36 of radionuclides and potential radiation exposure levels at these sites would be greater than 100 times
37 reportable quantities and quality standards. The corrective action for surface contamination sites ~~falls~~
38 ~~is addressed~~ within the scope of the RARA program.
39

40 The 216-U-14 Ditch has been issued a Surveillance and Compliance Inspection Report (SCIR),
41 and has been given a ranking of 13 out of 15 possible points. This means that the site has high
42 surface radiation levels, that it is accessible, and that there is ongoing surface contaminant migration
43 (Huckfeldt 1991b). Past sampling has also shown that the sediments contain radionuclide
44 concentrations at greater than 100 times the reportable quantity and quality standards. Actions for
45 control of surface contamination of this site are currently planned for implementation under the

1 RARA program. This action is in addition to efforts to discontinue liquid effluent discharged to 216-
2 U-14 Ditch (Section 9.2.1.3).

3
4 Surface contamination exists in an area surrounding 216-U-1 and 216-U-2 Cribs. This area has
5 been issued a SCIR and has been given an Environmental Protection Program ranking of 9 (Huckfelt
6 1991b). The area includes UN-200-W-19 Unplanned Release. This area is being stabilized as part of
7 the interim stabilization plan (RARA program).

8
9 The 216-U-7 French Drain and Unplanned Release UN-200-W-101 are both within an area of
10 surface contamination of up to 35,000 ct/min. Surface contamination control activities at this site are
11 recommended for evaluation and implementation under the RARA program.

12
13 The 207-U Retention Basin contains several contaminated areas with radiation counts of up to
14 70,000 dis/min. Only half of the basin is filled with water and there is potential wind blown
15 contaminant migration from the dry half. Surface contamination control activities at this site are
16 recommended for evaluation and implementation under the RARA program.

17
18 9.2.1.5 Non-ERA Sites. The primary reason most sites ~~waste management units and unplanned~~
19 ~~releases~~ were not recommended for ERAs was because of the lack of driving force to an exposure
20 pathway. Inactive cribs, ponds, ditches, and trenches are no longer receiving waste and, therefore,
21 no longer have artificial recharge as a driving force to move subsurface contaminants. Natural
22 recharge from local precipitation was not considered a significant short-term driving force. Specifics
23 for each waste management unit or unplanned release are provided in Table 9-2.

24
25 A majority of the unplanned release sites either ~~were deferred to~~ are addressed by the RARA
26 program to eliminate the airborne release pathway or had insufficient quantity and quality
27 concentration of contamination to qualify as an ERA.

28 29 30 9.2.2 Proposed Sites for Interim Remedial Measures

31
32 Twenty-three of the 46 waste management units and unplanned releases addressed in the U
33 Plant Aggregate Area data evaluation process were identified as high priority units (refer to section
34 5.0) and were assessed as candidates for IRMs. All but three of the 23 units designated as high
35 priority units and unplanned releases were so designated because of high HRS and mHRS scores.
36 The other unit and unplanned releases, 216-U-7 French Drain and UN-200-W-101 and
37 UN-200-W-161 Unplanned Releases, were designated as high priority because of surface radiation
38 measurements. The Environmental Protection rankings did not add to the high priority sites because
39 they had been included on the list because of the other criteria. The 216-U-8 Crib was not a high
40 priority unit but was included in the IRM assessment pathway within the cribs category because of its
41 similarity to the other facilities. Septic tanks and drain fields and unplanned releases were two
42 primary classes of units not considered in the IRM pathway.

43
44 ~~None~~ All of the 24 candidate IRM units or releases met the criteria for IRM designation, with
45 the exception of having adequate data. ~~therefore, no IRMs are recommended initially for the U Plant~~

1 ~~Aggregate Area. The reason units and unplanned releases did not meet the criteria was because none~~
2 ~~were considered to have adequate data to perform a qualitative risk assessment and/or select a~~
3 ~~remedy. Twenty units remain as IRM candidates but require LFIs to obtain sufficient information to~~
4 ~~proceed with the IRM. It was determined that an LFI could gather sufficient data for 20 of the 24~~
5 ~~units or releases, therefore, 20 units and releases remain IRM candidates. A discussion of the LFIs is~~
6 ~~provided in Section 9.2.3.~~

9.2.3 Proposed Sites for Limited Field Investigation Activities

10 Twenty waste management units are recommended to undergo LFIs. ~~The LFIs have to be~~
11 ~~recommended to provide sufficient information to proceed with an IRM. The rationale for IRM and~~
12 ~~LFI will be more completely developed in work plans, however, the following addresses possible~~
13 ~~considerations during work plan development.~~

14 Possible LFI objectives would be to:

- 15 • Evaluate the potential for releases from the waste management unit to impact underlying
16 groundwater quality.
- 17 • Determine if contamination exists in the soil beneath the waste management unit, and if
18 so, assess the extent.
- 19 • Assess the nature and extent of contaminant migration from the waste management unit
20 in support of focused feasibility studies.

21 Candidate IRM units have been categorized into two groups that contain similar release waste,
22 release mechanisms, and design. The first group contains cribs, French drains, and the reverse well.
23 The second group contains the U Pond system which includes the pond and associated trenches and
24 ditches.

25 9.2.3.1 Cribs, French Drains, and the Reverse Well. Cribs with collapse potential have also been
26 evaluated along the ERA pathway have been recommended for actions under the RARA program (see
27 Section 9.2.1). The actions implemented under the RARA program will precede the LFI activities.
28 Cribs with collapse potential include:

- 29 • 216-S-21
- 30 • 216-U-1
- 31 • 216-U-2
- 32 • 216-U-8

1 Cribs to be involved in LFI activities that do not require actions under the RARA program
2 (cribs without collapse potential) include:

- 3
- 4 • 216-U-12 (RCRA disposal facility)
 - 5
 - 6 • 216-U-16
 - 7
 - 8 • 216-U-17 (active)
 - 9
 - 10 • 216-Z-20 (active)

11

12 The two active cribs will be included in investigation activities if they are deactivated prior to
13 preparation of investigation plans.

14

15 French drains and reverse wells are essentially small diameter cribs and are therefore
16 categorized with cribs. The units include:

- 17
- 18 • 216-S-4
 - 19
 - 20 • 216-U-3
 - 21
 - 22 • 216-U-4 (Reverse Well)
 - 23
 - 24 • 216-U-4A
 - 25
 - 26 • 216-U-4B
 - 27
 - 28 • 216-U-7

29

30 The cribs with collapse potential and the 216-U-7 French Drain were addressed in the IRM
31 pathway after first being assessed in the ERA pathway. The actions recommended for the units will
32 not address the subsurface contaminations in the facilities; therefore, they were included for
33 assessment under the remaining criteria. The cribs, French drains and reverse well, with the
34 exception of 216-U-8, were high priority units. The 216-U-8 Crib was included in the cribs grouping
35 because of its similarity to the other cribs.

36

37 The initial decision point in the IRM pathway is to assess whether data are adequate to conduct
38 an IRM. The data available for cribs are screening level data and estimated inventories which do not
39 provide information on the nature and extent of the contamination. Therefore, an IRM could not be
40 implemented without further investigation.

41

42 Similarities of units may make it possible to remediate them using the observational approach
43 after characterizing only a few of the units. Therefore, it was expected that a LFI would provide
44 sufficient information to proceed with an IRM for waste management unit groups. Therefore, the
45 basis for recommending a LFI is that sufficient information can be gained from a more detailed

1 investigation of one or two of the cribs and a French drain that would allow a remedial decision to be
2 made on the other cribs with little or no additional characterization.
3

4 Possible representative cribs for the U Plant Aggregate Area would be the combined 216-U-1
5 and 216-U-2 Cribs, the 216-U-12 Crib, and 216-U-3 French Drain. The 216-U-1 and 216-U-2 Cribs
6 were selected to represent cribs receiving waste during initial operations in addition to being
7 representative of perched water and mobile uranium contamination conditions. The 216-U-12 Crib
8 was selected to be representative of cribs receiving waste from more recent operations. The 216-U-
9 12 Crib was selected also since it is a RCRA TSD facility which may require characterization for
10 closure under RCRA. The 216-U-3 French Drain was chosen because it received the most waste of
11 the French drains and has the highest inventory of contaminants. The rationale for IRM and LFI will
12 be more completely developed in work plans.
13

14 9.2.3.2 U Pond, Trench, and Ditches. The U Pond system consists of the following sites:

- 15 • 216-U-10 Pond and associated unplanned release sites
- 16 • 216-U-11 Trench
- 17 • 216-U-14 Ditch (Active)
- 18 • 216-Z-1D Ditch
- 19 • 216-Z-11 Ditch
- 20 • 216-Z-19 Ditch
- 21
- 22
- 23
- 24
- 25
- 26
- 27

28 The waste management units are all high priority units and have been designated as IRM
29 candidates. These units have insufficient data to conduct an IRM and, therefore, have been
30 recommended for additional characterization. Although the Z ditches received waste from a distinctly
31 different source than the remaining trench and ditch, these sites are grouped together because all
32 wastes were commingled in U Pond. The U Pond system contains over 5 km (3 mi) of trenches and
33 ditches and 12 hectares (30 acres) of pond spreading area. The vast area of the pond and ditches does
34 not require an exhaustive characterization effort because contaminant profiles are expected to be
35 similar along the trenches and ditches and throughout the pond area. Therefore, a LFI was
36 recommended to characterize a limited number of areas of the trench, ditches and pond. The
37 information gained from the LFI is expected to provide sufficient information to continue with an
38 IRM if it is determined to be justified.
39

40 Investigation of the active portion of the 216-U-14 Ditch will be included in the past practices
41 investigation of the ponds and ditches if the unit is deactivated prior to the investigation. Deactivation
42 of the ditch will remain with the ongoing program which is evaluating alternatives to replace the unit.
43

44 9.2.4 Proposed Sites for Final Remedy Selection

45

WHC.12/3-19-92/02154A

1 A number of unplanned releases, along with several diverse waste management units which are
2 unique because of design, contaminants received, or operational history, have been proposed for the
3 final remedy selection path. It was determined that sufficient information may exist to perform a RA
4 and select a final remedy for one french drain, three trenches, and four unplanned releases; these are
5 discussed in Section 9.2.4.2. The RIs are recommended for the remainder of the waste management
6 units and unplanned releases due to the lack of information to perform RAs and select final remedies.
7 These waste management units and unplanned releases are discussed in Section 9.2.4.1.
8
9

10 9.2.4.1 Proposed Sites for Remedial Investigation. ~~Sites proposed for an operable unit or aggregate~~
11 ~~area RI include a large group of unplanned releases along with a small group of diverse units which~~
12 ~~are unique because of design or contaminants received.~~
13

14 ~~The sites proposed for an RI have been placed in categories for discussion purposes. A RI has~~
15 ~~been recommended for the U Plant Aggregate Area which includes several groups of waste~~
16 ~~management units and unplanned releases. The first category group generally contains a mix of~~
17 ~~unique units which were assessed in the IRM pathway but had insufficient data to conduct an IRM.~~
18 ~~The second category group consists of low priority trenches (dry trenches) which generally received~~
19 ~~one time transfers of waste. The third group category contains septic tanks and drain fields which~~
20 ~~require confirmatory sampling to show that the sites do not contain hazardous or radioactive~~
21 ~~substances. The fourth category group contains burial sites which require confirmatory sampling to~~
22 ~~show no contamination exists. The fifth category group contains low priority unplanned releases~~
23 ~~which have unique contamination histories.~~
24

25 9.2.4.1.1 Retention Basin and Settling Tank. The two waste management units within this
26 group are high priority and were assessed in the IRM pathway prior to designation as final remedy
27 sites. The sites include:
28

- 29 • 207-U Retention Basin
- 30
- 31 • 241-U-361 Settling Tank
- 32

33 The retention basin was first assessed in the ERA pathway and was recommended for
34 disposition under the RARA program. The retention basin required surface contamination control
35 measures. The RARA program action does not assess subsurface releases from the facility and,
36 therefore, the unit continued to be assessed against the remaining criteria.
37

38 The two units in this group have been assessed as high priority units in the IRM pathway.
39 Insufficient data exists to conduct an IRM for these units. Because of their unique design and release
40 pathways, these units have no similar sites-units with which they can be grouped for the purposes of
41 an LFI.
42

43 Insufficient data exists at these sites to conduct a RA. A RI is recommended which would
44 include each of these sites to provide nature and extent of contamination information to perform a risk
45 assessment for final remedy selection.

1 9.2.4.1.2 Trenches. Four trenches have been grouped as a single class because of their
2 similarity. These trenches are basically excavations which were opened for a short duration of time
3 then filled in. The trenches include:

- 4
- 5 • 216-U-5
 - 6
 - 7 • 216-U-6
 - 8
 - 9 • 216-U-13
 - 10
 - 11 • 216-U-15
 - 12

13 All trenches are low priority units which were assessed in the final remedy selection pathway
14 only. The units are generally unique in the types of waste received. Three of the units, 216-U-13
15 being the exception, received one time transfers of waste which indicate a low migration potential.
16 The 216-U-13 site received small quantities of equipment decontamination waste.

17

18 The units were grouped and RA possibilities were examined. No data exists to determine the
19 nature and extent of contamination at these sites. Therefore, a RI which includes each unit was
20 recommended to provide data adequate to perform a RA and select a final remedy for the units. The
21 unique nature of the units will not allow for investigation of a representative unit and applying the
22 information to the other sites.

23

24 9.2.4.1.3 Septic Tanks and Drain Fields. Confirmatory investigation levels should be
25 performed at each of the septic tanks and drain fields: 2607-W-5, 2607-W-7, and 2607-W-9. The
26 investigation at 2607-W-5 should begin after an ERA has been completed. These four sites all have
27 been assigned low HRS scores by comparison with other units.

28

29 There are no sampling or inventory data for any of the sites and so a RA cannot be performed.
30 The purpose of a limited sampling program is to confirm that no contamination exists in the tanks and
31 drain fields. If no contamination were to be found, then no further action would likely be
32 recommended.

33

34 9.2.4.1.4 Construction Surface Laydown Area and the Burning Pit/Burial Ground.
35 Confirmatory investigation levels should be conducted at the Construction Surface Laydown Area and
36 the Burning Pit/Burial Ground. These units have been assigned low HRS scores by comparison with
37 other units and unplanned releases. There are no sampling or inventory data available for the areas,
38 so RAs cannot be performed. Historical data on the Construction Surface Laydown Area do not
39 indicate the disposal of any radioactive or hazardous material at this unit. The available information
40 on the Burning Pit/Burial Ground indicates that the contamination was cleaned up. Investigation is
41 were recommended for these units to provide enough data to confirm that contamination does not
42 exist at either of the two units. If no contamination were to be found, then no further action would
43 be recommended.

44

1 9.2.4.1.5 Unplanned Releases. Thirteen unplanned releases with known contamination are
2 candidates for inclusion in an aggregate area or operable unit RI and two of these sites are
3 recommended to undergo surface radiation cleanup under the RARA program before RI initiation.
4 These sites are:

- 5
- 6 • UN-200-W-6
- 7
- 8 • UN-200-W-19 (RARA)
- 9
- 10 • UN-200-W-33
- 11
- 12 • UN-200-W-39
- 13
- 14 • UN-200-W-48
- 15
- 16 • UN-200-W-55
- 17
- 18 • UN-200-W-60
- 19
- 20 • UN-200-W-68
- 21
- 22 • UN-200-W-78
- 23
- 24 • UN-200-W-101 (RARA)
- 25
- 26 • UN-200-W-117
- 27
- 28 • UN-200-W-118
- 29
- 30 • UN-200-W-161
- 31

32 Confirmatory sampling is only recommended for six unplanned releases. Unplanned Releases
33 UN-200-W-33, UN-200-W-68 and UN-200-W-78 all have HRS scores below 28.5, and do not have
34 any data to support a RA. Sites UN-200-W-117, UN-200-W-118 and UN-200-W-60 all have
35 insufficient information available for HRS scoring. However, each unplanned release is described as
36 having been cleaned up or released as a radiation zone as contamination decayed to background
37 levels. It is thus assumed that these sites would have low HRS scores. Confirmatory sampling is
38 recommended for these unplanned releases to provide enough data to confirm that contamination does
39 not exist at these unplanned release locations. If no contamination is found, no further action would
40 be recommended.

41
42 The unplanned releases, with the exception of the two RARA releases, all had low HRS scores
43 and surface radiation levels and were classified as low priority. The low priority releases are assessed
44 under the final remedy selection pathway. The two releases for which surface contamination cleanup

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1 actions were deferred to the RARA Program are not expected to be fully cleaned and therefore were
2 regrouped with the other unplanned releases.

3
4 A lack of soil sample data and inconsistent survey data make RA completion impossible. A RI
5 needs to be performed to identify the contaminants and their extent.

6
7 9.2.4.2 Proposed Sites for Risk Assessment. One candidate has sufficient information for inclusion
8 in the final RA under the final remedy selection path. The candidate, Unplanned Release UN-200-W-
9 46, occurred during transit of a contaminated piece of equipment across the aggregate area. There is
10 no specific geographic area identified as contaminated and no contamination has been attributed to this
11 release.

12
13 It is recommended that this unplanned release be included in the final RA without additional
14 investigation. It is likely that no further action will be required for this release.

15
16
17 ~~9.2.5 Proposed Sites for No Further Action~~

18
19 ~~Unplanned Release UN 200 W 46 has been designated as a no further action site. The~~
20 ~~unplanned release occurred during transit of a contaminated piece of equipment across the aggregate~~
21 ~~area. There is also no specific geographic area that was contaminated. There was insufficient data~~
22 ~~on Unplanned Release UN 200 W 46 to give it an HRS score and it was only described as spotty~~
23 ~~contamination in the Z and U Plant aggregate areas.~~

24
25
26 9.3 SOURCE OPERABLE UNIT REDEFINITION AND PRIORITIZATION

27
28 The investigation process can be made more efficient if units with similar histories and waste
29 constituents are studied together. The data needs and remedial actions required for similar waste
30 management units are generally the same. It is much easier to ensure a consistent level of effort and
31 investigation methodology if like units are grouped together. Economies of scale also make the
32 investigation process more cost effective if similar units are studied together.

33
34
35 9.3.1 ~~Units Deferred to Addressed by Other Aggregate Areas or Programs~~

36
37 The investigation of several sites should be transferred from the U Plant aggregate area to other
38 aggregate areas for investigation. The 216-S-4 French Drain and the 216-S-21 Crib should be
39 transferred to the S Plant Aggregate Area. The 216-Z-20 Crib should be transferred to the Z Plant
40 Aggregate Area. Transfer of these units would allow them to be investigated with other units with
41 similar waste histories.

42
43 All waste management units and unplanned releases in the 200-UP-3 Operable Unit are
44 ~~recommended for deferral to~~ addressed by the Single-Shell Tank closure program. The units include

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ATTACHMENT 3

EXECUTIVE SUMMARY

87-0-1452126

U PLANT SOURCE AAMS EXECUTIVE SUMMARY

1
2
3 This report presents the results of an aggregate area
4 management study (AAMS) for the U Plant Aggregate Area in the 200
5 Areas of the U.S. Department of Energy (DOE) Hanford Site in
6 Washington State. This scoping level study provides the basis
7 for initiating Remedial Investigation/Feasibility Study (RI/FS)
8 activities under CERCLA or Facility Investigations (RFI) and
9 Corrective Measures Studies (CMS) under RCRA. This report also
10 integrates select RCRA treatment, storage or disposal (TSD)
11 closure activities with CERCLA and RCRA past practice
12 investigations.

13
14 Through the experience gained to date on developing work
15 plans, closure plans and permit applications at the Hanford Site,
16 the parties to the Tri-Party Agreement have recognized that all
17 past-practice investigations must be managed and implemented
18 under one characterization and remediation strategy, regardless
19 of the regulatory agency lead (as defined in the Tri-Party
20 Agreement). In particular, the parties have identified a need
21 for greater efficiency over the existing RI/FS and RFI/CMS
22 investigative approaches, and have determined that, to expedite
23 the ultimate goal of cleanup, much more emphasis needs to be
24 placed on initiating and completing waste site cleanup through
25 interim measures.

26
27 This streamlined approach is described and justified in The
28 Hanford Federal Facility Agreement and Consent Order Change
29 Package, dated May 16, 1991 (Ecology et al. 1991). To implement
30 this approach, the three parties have developed the Hanford Site
31 Past-Practice Strategy (DOE/RL 1992) for streamlining the past-
32 practice remedial action process. This strategy provides new
33 concepts for:

- 34
35 • Accelerating decision-making by maximizing the use
36 of existing data consistent with data quality
37 objectives
38
39 • Undertaking expedited response actions and/or
40 interim remedial measures, as appropriate, to
41 either remove threats to human health and welfare
42 and the environment, or to reduce risk by reducing
43 toxicity, mobility, or volume of contaminants.
44
45

46 The Hanford Site Past-Practice Strategy (DOE/RL 1992)
47 describes the concepts and framework for the RI/FS (or RFI/CMS)
48 process in a manner that has a bias-for-action through optimizing
49 the use of interim remedial actions, culminating with decisions

1 on final remedies on both an operable-unit and aggregate-area
2 scale. The strategy focuses on reaching early decisions to
3 initiate and complete cleanup projects, maximizing the use of
4 existing data, coupled with focused short-time-frame
5 investigations, where necessary. As more data become available
6 on contamination problems and associated risks, the details of
7 the longer term investigations and studies will be better
8 defined.

9
10 The strategy includes three paths for interim decision-
11 making and a final remedy-selection process for the operable unit
12 that incorporates the three paths and integrates sites not
13 addressed in those paths. The three paths for interim decision-
14 making include the expedited response action (ERA), interim
15 remedial measure (IRM) and limited field investigation (LFI)
16 paths. The strategy requires that AAMSRs be prepared to provide
17 an evaluation of existing site data to support initial path
18 decisions. This AAMSR is one of ten reports that will be
19 prepared for each of the ten aggregate areas defined in the 200
20 Areas.

21
22 The near-term past practice strategy for the 200 Areas
23 provides for ERAs, IRMs, and LFIs for individual WMUs, WMU groups
24 and groundwater plumes, and recommends separate source and
25 groundwater operable units. Initial site-specific
26 recommendations for each of the WMUs within the U Plant Aggregate
27 Area are provided in the report. Work plans starting with the
28 200-UP-2 Work Plan will initially focus on limited intrusive
29 investigations at the highest priority WMUs or WMU groups as
30 established in the AAMSR. The goal of this initial focus is to
31 establish whether interim remedial measures are justified. WMUs
32 identified as candidate ERAs in Section 9 of the AAMS will be
33 further evaluated following the Site Selection Process for
34 Expedited Response Actions at the Hanford Site (WHC-MR-0290).
35

36 While these elements may mitigate specific contamination problems
37 through interim actions, the process of final remedy selection
38 must be completed for the operable unit or aggregate area to
39 reach closure. The aggregation of information obtained from the
40 LFIs and interim actions may be sufficient to perform the
41 cumulative risk assessment and to define the final remedy for the
42 operable unit or aggregate area. If the data are not sufficient,
43 additional investigations and studies will be performed to the
44 extent necessary to support final remedy selection. These
45 investigations would be performed within the framework and
46 process defined for RI/FS programs.
47

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1 Several integration issues exist that are generic to the overall
2 past practice process for the 200 Areas and include the
3 following:

4
5 Future Work Plan Scope. Although the current practice for
6 implementing RI/FS (RFI/CMS) activities is through operable
7 unit based work plans, individual LFI/IRMs may be more
8 efficiently implemented using LFI/IRM-specific work plans.

9
10 Groundwater Operable Units. A general strategy recommended
11 for the 200 Area is to define separate operable units for
12 groundwater affected by 200 Area source terms. This
13 requires that groundwater be removed from the scope of
14 existing source operable units and new groundwater-specific
15 operable units be established. Recommendations for
16 groundwater operable units will be developed in the
17 groundwater AAMSRs.

18
19 Work Plan Prioritization. Although priorities are
20 established in the AAMSR for operable units within the
21 aggregate area, priorities between aggregate areas have yet
22 to be established. The integration of priorities at the 200
23 Area level is considered a prerequisite to establishing a
24 schedule for past practice activities in the 200 Area.

25
26 It is intended that these integration issues be resolved
27 following the completion of all 10 AAMSRs (Draft A) scheduled for
28 September 1992. Resolution of these issues will be based on a
29 decisions/consensus process among EPA, Ecology, and DOE.
30 Following resolution of these issues a schedule for past practice
31 activities in the 200 Area will be prepared.

32
33
34 Background, environmental setting, and known contamination data
35 are provided in Sections 2.0 and 3 and Subsection 4.1. This
36 information provides the basis for development of the preliminary
37 conceptual model in Subsection 4.2 and assessing health and
38 environmental concerns in Section 5.0. Preliminary ARARs
39 (Section 6.0) and preliminary remedial action technologies
40 (Section 7.0) are also developed based on this data.
41 Section 8.0, provides a discussion of the data quality
42 objectives. Data needs identified in Section 8.0 are based on
43 data gaps determined during the development of the conceptual
44 model, human health and environmental concerns, ARARs, and
45 remedial action technologies. Recommendations in Section 9.0 are
46 developed using all the information provided in the sections
47 which precede it.
48
49

DOE/RL-91-52
DRAFT A

1 The Hanford Site, operated by the DOE, occupies about 1,450
2 km² (560 mi²) of the southeastern part of Washington north of the
3 confluence of the Yakima and Columbia Rivers. The Hanford Site
4 was established in 1943 to produce plutonium for nuclear weapons
5 using production reactors and chemical processing plants. The
6 U Plant Aggregate Area is located within the 200 West Area, near
7 the middle of the Hanford Site. There are 3 operable units
8 within the U Plant Aggregate Area.
9

10 Between 1952 and 1958, uranium was recovered from single-
11 shell tank wastes which resulted from the bismuth phosphate
12 process. A solvent extraction process which used tributyl
13 phosphate in normal paraffin hydrocarbon (kerosene) solvent to
14 recover uranium from a nitric acid solution was employed at 221-
15 U. The 224-U (UO₃) building operated between 1955 and the
16 present, converting uranyl nitrate hexahydrate to powdered UO₃.
17

18 The U Plant Aggregate Area contains a large variety of waste
19 disposal and storage facilities. High-level wastes were stored
20 in underground single-shell tanks. Low-level wastes such as
21 cooling and condensate water were allowed to infiltrate into the
22 ground through cribs, ditches, and open ponds. Based on
23 construction, purpose, or origin, the U Plant Aggregate Area
24 waste management units fall into one of ten subgroups as follows:
25

- 26 • 1 (No. of WMUs) Plants, Buildings and Storage Areas
- 27
- 28 • 22 Tanks and Vaults
- 29
- 30 • 12 Cribs and Drains
- 31
- 32 • 1 Reverse Well
- 33
- 34 • 10 Ponds, Ditches and Trenches
- 35
- 36 • 4 Septic Tanks and Associated Drain Fields
- 37
- 38 • 13 Transfer Facilities, Diversion Boxes and Pipelines
- 39
- 40 • 1 Basin
- 41
- 42 • 2 Burial Sites
- 43
- 44 • 34 Unplanned Releases.
- 45

46 Detailed descriptions of these waste management units are
47 provided in Section 2.3.
48

1 There are several ongoing programs that affect buildings and
2 waste management units in the U Plant Aggregate Area (Section
3 2.7). These programs include RCRA, the Hanford Surplus
4 Facilities Program, the Radiation Area Remedial Action (RARA)
5 Program, the Hanford Site Single-Shell Tank Program, and the
6 Defense Waste Management Program. Fifty-two units (primarily
7 single-shell tanks and associated transfer facilities) fall
8 completely within the scope of one of these programs and,
9 therefore, recommendations on these units will be made by the
10 respective programs rather than in this AAMS. An additional 10
11 waste management units will be partially addressed by an ongoing
12 program in addition to the actions recommended in the U Plant
13 AAMS.
14

15 Discussions of surface hydrology, and geology are provided
16 on a regional, Hanford Site, and aggregate area basis in Section
17 3.0. The interpretation is based on a limited number of wells
18 and this limitation does not support a detailed delineation of
19 waste management unit specific features. The section also
20 describes the Flora and Fauna, Land Use Water Use and Human
21 Resources of the 200 West Area and vicinity. Groundwater of the
22 200 West Area is described in detail in a separate Groundwater
23 AAMSR.
24

25 A preliminary site conceptual model is presented in Section
26 4.0. Section 4.1 presents the chemical and radiological data
27 that are available for the different media types (including
28 surface soil, vadose zone soil, air, surface water and biota) and
29 site-specific data for each waste management unit and unplanned
30 release.
31

32 A preliminary assessment of potential impacts to human
33 health and the environment is presented in Section 4.2. This
34 assessment includes a discussion of release mechanisms, potential
35 transport pathways, and a preliminary conceptual model of human
36 exposure based on these pathways. Physical, radiological, and
37 toxicological characteristics of the known and suspected
38 contaminants at the aggregate area are also discussed.
39

40 Health and environmental concerns are presented in Section
41 5.0. The preliminary qualitative evaluation of potential human
42 health concerns is intended to provide input to the waste
43 management unit recommendation process. The evaluation includes
44 1) an identification of contaminants of potential concern for
45 each exposure pathway that is likely to occur within the U Plant
46 Aggregate Area, 2) identification of exposure pathways
47 applicable to individual waste management units and 3) estimates
48 of relative hazard based on four available indicators of risk;
49 the CERCLA Hazard Ranking System (HRS) and modified HRS (mHRS),

1 surface radiation survey data, and Westinghouse Environmental
2 Protection Group site scoring.

3
4 Potentially Applicable or Relevant and Appropriate
5 Requirements (ARARs) to be used in developing and assessing
6 various remedial action alternatives at the U Plant Aggregate
7 Area are discussed in Section 6.0. Specific potential
8 requirements pertaining to hazardous and radiological waste
9 management, remediation of contaminated soils, surface water
10 protection, and air quality are discussed.

11
12 Preliminary remedial action technologies are presented in
13 Section 7.0. The process includes identification of remedial
14 action objectives (RAOs), determination of general response
15 actions, and identification of specific process options
16 associated with each option type. The process options are
17 screened based on their effectiveness, implementability and cost.
18 The screened process options are combined into alternatives and
19 the alternatives are described.

20
21 Data Quality is addressed in Section 8.0. Identification of
22 chemical and radiological constituents associated with the units
23 and their concentrations, with a view to determine the
24 contaminants of concern and their action levels, is a major
25 requirement to execute the Hanford Site Past-Practice Strategy.
26 There was found to be a limited amount of data in this regard.
27 The section provides a summary of data needs identified for each
28 of the waste management units in the U Plant Aggregate Area. The
29 data needs provide the basis for development of detailed data
30 quality objectives in subsequent work plans.

31
32 Section 9.0 provides management recommendations for the
33 U Plant Aggregate Area based on the Hanford Site Past-Practice
34 Strategy. Criteria for selecting appropriate Hanford Site Past-
35 Practice Strategy paths (ERA, IRM, and final remedy selection)
36 for individual waste management units and unplanned releases in
37 the U Plant Aggregate Area are developed in Section 9.1. As a
38 result of the data evaluation process, one waste management unit
39 was recommended for an ERA, for IRMs or LFIs which could lead
40 to IRMs and for final remedy selection. A discussion of the
41 data evaluation process is provided in Section 9.2.
42 Recommendations for redefining operable unit boundaries and
43 prioritizing operable units for work plan development are
44 provided in Section 9.3. Included in Section 9.3 are the
45 interactions with RCRA required to disposition the 216-U-12 RCRA
46 TSD facility. All recommendations for future characterization
47 needs will be more fully developed and implemented through work
48 plans. Sections 9.4 and 9.5 provide recommendations for focused
49 feasibility and treatability studies, respectively.

9252232D
ATTACHMENT 4

TELECONFERENCE MINUTES

9212541.0180

TELEPHONE CONFERENCE MEMORANDUM

Company: WHC Address: PO Box 1970, Richland H4-55

[] INCOMING [X] OUTGOING DATE: March 31, 1992 TIME: 1:30 p.m.

WITH: Curt Wittreich OF: WIIC PHONE: 6-1862
Michael Galgoul WHC 6-2038

WITH: Michael Rosenfeld OF: Ebasco PHONE: (206) 451-4654
Matt Schultz Ebasco (206) 451-4186
Dean Tulberg Ebasco (206) 451-4279
Allan Harris DOE-RL (509) 376-4339
Larry Goldstein Ecology (206) 459-6859
Dave Einan EPA (509) 376-3883

Copies to: Name Address
U Plant Project File H4-55

Subject: Ecology/EPA Comments on U Plant

The main purpose of this telephone conference was to clarify Ecology comments on the U Plant AAMSR that had not previously been discussed.

SUMMARY OF CONFERENCE

Curt Wittreich initiated the discussion by stating that the purpose of the telephone conference was to clarify and discuss Ecology comments on the U Plant AAMSR that had not yet been resolved. Larry Goldstein indicated that the comments in question were #25, #50, #65, and #69 (Letter L. Goldstein, Ecology, to A.C. Harris, RL, "Ecology Review of the U Plant Source Aggregate Area Management Study Report").

Larry began by discussing comment #25. This comment deals with sufficiency of data to recommend an IRM at the 216-U Pond. Larry stated that he felt there were several pieces of information that seemed to factor an IRM: surface rad readings led to placement of 2 feet of fill; a reading of 570 mrem/yr; large amounts of effluent discharged historically; and high estimates of uranium, plutonium, and strontium-90 loading to the pond. More generally, Larry believed that more data or references were needed to justify why it was determined that inadequate information was available to recommend IRMs at the 24 candidate IRM sites.

Curt asked if Larry favored an IRM for the 216-U Pond and offered to reevaluate the recommendations presented in the AAMSR. Larry responded that he was seeking more substantial justification for the decision that insufficient data existed to support an IRM, although there appeared to be substantial data.

Curt explained that a different angle was used: can we justify an IRM?

Larry pointed out two criteria: could a baseline conceptual model be done; and could we undertake a qualitative risk assessment? Larry suggested that the data might indicate that a range of alternatives might be possible, including removal, vitrification, and capping.

Curt replied that he would investigate to determine if sufficient data existed to do a qualitative risk assessment using the Hanford risk assessment methodology.

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Larry reiterated that he was interested in seeing more information to support statements made in Chapter 9. Specifically, the text reads that a "dramatic" decrease in surface radiation measurements occurred. Larry would like to see the data or the references that indicated this trend.

Curt replied that there may be a problem with supplying information contained in unreleased documents. Larry expressed concern that Ecology and EPA should be allowed to see all available data. Michael Galgoul explained that releasing WHC/DOE documents sometimes required considerable effort; because of the time constraints on the AAMS project, efforts were focused on data assimilation. WHC will show the agencies the data and the administrative record, and would start the process of releasing the documents if requested.

Curt added that the 200-UP-2 Technical Baseline Report is a background document that contains information supporting the 200 AAMS. However, the U-Pond is associated with the UP-1. Therefore, this document does not present data on the U-Pond.

The discussion then turned to comment #50, which deals with defining high priority sites.

There was some confusion about whether or not the 216-U-1 and 216-U-2 cribs and the 216-U-10 Pond are defined as high priority sites. Apparently, there was a misreading of the paragraph referenced in comment #50. In fact, these three waste management units are defined as high priority units, as summarized in Table 5-1 of the AAMSR. No action is required on this comment and it was agreed that it would therefore be rejected.

Comment #65 deals with the issue of the steps following the AAMS needed to make IRM determinations. Larry perceived an inconsistency between the approach stated in the paragraph referenced in comment #65 and the Hanford Past Practice Strategy. Curt described the direct action paths, and indicated that an LFI is needed to determine if an IRM is justified. Future work plans will specify what is to be done in the LFI and will provide the rationale for actions.

Larry indicated that Ecology's reading of the Hanford Past Practice Strategy was that the direction was to get away from producing documents and emphasize the bias-for-action strategy. He felt that the recommendations suggested yet another document must be produced before an LFI or IRM could be undertaken. Larry replied he didn't feel another WP was needed to produce a schedule, work scope, and other items to get data to do an IRM. Larry was seeking an explanation of how the bias-for-action strategy will be implemented.

Curt replied that work plans must first be prepared, but that they will consist mostly of a sampling and analysis plan (SAP). The first 4 to 5 chapters of the work plan will be taken from the AAMSR. Nonetheless, planning for the SAP would still be needed for items such as numbers of samples, drilling rigs, and so forth. That is, an SAP is needed to conduct an LFI.

Larry recommended that if an SAP is needed just to define data needs, that the text on page 9-2 be rewritten to reflect this approach. He also suggested that it be emphasized that the most expeditious method would be used.

Larry next discussed comment #69. This comment deals with the use of the criterion of 100x the applicable standard to qualify for an ERA. Larry stated that he did not see a clear rationale for the use of such a criterion and he also questioned its accuracy. Furthermore, he questioned if there was any agreement to use such a criterion, whether it had any standing, and how it would affect all tasks.

Allan Harris indicated that there had been much discussion on Figure 9-1 (the data evaluation process flowchart). Allan described how this strategy had been developed for informational purposes, and that Doug Sherwood (EPA) and Chuck Cline (Ecology) were present at a discussion of the process. Figure 9-1 was presented as an extension of the Past Practice Strategy to supply some criteria for AAMS decisions. At the end of the meeting between DOE, WHC, Ecology, and EPA, an agreement accepting the flowchart was signed by Julie Erickson (DOE), Doug Sherwood (EPA), Rich Carlson (WHC), and Chuck Cline (Ecology). Later, the first decision diamond ("is an ERA justified?") was added. The purpose of this meeting was to get input from the regulators. If the regulators disagreed with the flowchart and the process, a major rewrite would be needed. To date, this strategy has been used in all the AAMS, and much work has been done using the flowchart that has been agreed to. Allan noted that there were a number of other comments related to the flowchart and the decision-making process. He suggested that all these questions should be looked at together, and if necessary, Figure 9-1 may need to be modified.

Michael Galgoul explained that the use of the number 100 was not intended to imply a specific numeric criteria; rather, it was an attempt to establish a criteria that could be used consistently throughout the AAMS. The number is not specifically justifiable.

Larry accepted the goal of consistency and stated that he understood the effort to provide further definition. He added that there is much subjectivity in the criteria used to determine threats to human health and the environment. Numbers can be misleading in this determination because of possible cumulative effects or absence of standards. He doesn't want to preclude the use of ERAs because the 100x criterion is not met. Larry stated that because the number 100 is arbitrary, there shouldn't be a standard. If a standard is needed, then the parties should work together to establish this number.

Dean Tulberg explained that the use of a numerical value was an effort to quantify "substantial" in the phrase "imminent and substantial endangerment." Larry replied that the number was still very subjective. Dean accepted this point, but emphasized the need for consistency. Curt added that the consistency was needed to ensure that the producers and reviewers of the reports could duplicate the recommendations. Specific criteria are important to removing the subjectivity. Michael added that the goal of consistency was not intended to exclude future ERAs. He suggested adding text that stated that future decisions regarding ERAs may be different from the recommendation presented in the AAMSR.

Larry accepted this suggestion. He explained that the text addition should be more than a sentence, and should state that MTCA, DOE orders, Ecology, EPA and other regulations and guidance should be applied in making these decisions. Larry stated that his concern was that because the AAMS is a benchmark to augment the decision-making process, he didn't want to see the 100x criteria acquire the same weighing as other policies. He wants to retain the subjectivity in making decisions regarding ERAs.

Larry brought up the example of the 2607-W5 Septic Tank. Larry stated that he didn't see a crisp determination based on data that justified the recommendation for an ERA. Dean indicated that more explanation would be added.

Larry also brought up comment #67, in particular the use of the mHRS scoring system. Larry indicated that the mHRS scoring process was created by PNL and it seems to be an improvement for sites where radionuclides are present. Nonetheless, the mHRS process is not approved by EPA and Ecology. He wanted to note the context of the mHRS as a screening tool. It was suggested to Larry that the text be modified to clarify how the mHRS criterion was used. Larry indicated that he didn't object to the use of the mHRS, but wanted acknowledgement that the mHRS process was not approved. Allan indicated that the

text should state this fact. Larry added that he would like to see additional discussion describing the mlRS process.

Allan Harris brought up comment #73, which deals addresses the issue of availability of resources as a criterion. Larry explained that the decision to recommend an ERA and the availability of resources are separate issues. An ERA determination is to be made irrespective of resource availability. It was explained to Larry that the intention was not to restrict ERAs solely based on resource availability, but that resources would affect the timing of implementation. Larry accepted Allan's suggestion that the text would be clarified to reflect his point.

Allan next brought up comment #73, which deals with an unplanned release site for which the location is not known. Larry expressed concern that a "lost site" was recommended for no further action because it couldn't be found. Dean explained that the decision on the "lost site" is being revised. Michael indicated that lost sites would be investigated during the end of the study process.

Allan indicated that Mike Thompson (DOE) is looking into the issues of comment #77, which deals with redesignation of 216-U-14 as a RCRA unit. Michael related to Allan that WHC has not yet made a determination of this issue.

Allan stated that he wants to see a full disposition of comments sent to EPA/Ecology. He would like to meet with the agencies if there are any unresolved issues. He doesn't want to reach apparent agreement only to find out later that there are still disagreements.

Larry mentioned discussions in the unit manager's meeting surrounding the 216-U-17 crib and the 241-WR vault. He wanted to know why these units were deferred. Michael responded that these units would be addressed more fully in the 200-UP-2 work plan. Larry also felt it was more appropriate to address the 216-U-17 crib under a RCRA closure. Michael replied that there was not agreement on moving this unit to another operable unit. To keep the crib from "dropping through the cracks," it was retained in the 200-U?-2 Work Plan.

Larry also asked when the issue of moving the 216-U-14 ditch to 200-UP-1 would be addressed. Michael replied that WHC has not yet met with DOE-RL to start this discussion. Larry replied that he did not consider the movement of the 216-U-14 ditch to another operable unit to be a RCRA vs. CERCLA issue, but that he just wanted to identify the best way of addressing this waste management unit. He didn't want to defer cleaning up sites to the next century. Michael indicated that the U-14 issue was on a parallel track with the AAMS, and will be discussed with DOE-RL.

Michael indicated that he would contact Larry to indicate when the redline copy of the U Plant AAMSR and the comment dispositions would be delivered.

SUMMARY OF ACTION ITEMS:

- Michael Galgoul: respond to Larry Goldstein regarding delivery date for redline AAMSR and comment dispositions.
- Curt Wittreich: check on methodology of Hanford Risk Assessment to determine if sufficient data exist to perform assessment.
- Dean Tulberg: Make specified changes to U Plant AAMSR.

*REISSUE

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Author	Addressee	Correspondence No.
S. H. Wisness, RL (M. J. Galgoul, WHC)	P. T. Day, EPA D. B. Jansen, Ecology	Incoming 9202740 Xref 9252232D

Subject: RESPONSE TO THE STATE OF WASHINGTON DEPARTMENT OF ECOLOGY AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S REVIEW OF THE U PLANT SOURCE AGGREGATE AREA MANAGEMENT STUDY REPORT DRAFT A

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The enclosures are the same as outgoing letter 9252232D. 1dp, 6-7049



*Reissue of letter on 4/30/92 to show correct letter number (9202314 is wrong).