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United States
Environmental Protection
Agency

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9207537



October 14, 1992



Steven H. Wisness
Tri-Party Agreement Manager
Department of Energy
Richland Operations Office
P.O. Box 550
Richland, WA 99352

Re: 200 North Aggregate Area Management Study Report Review

Dear Mr. Wisness

The Environmental Protection Agency (EPA), the Department of Ecology (Ecology), and their contractors have completed the review of the 200 North Aggregate Area Management Study Report (DOE/RL-92-17, Draft A). Enclosed are the combined comments on the technical and regulatory content of this report.

Also enclosed is a copy of Ecology's comments, as the support agency, for inclusion into the Administrative Record. A separate response to these comments is not required.

A Word Perfect 5.1 diskette is enclosed for you convenience.

If you have any questions or concerns regarding these comments, please contact me at (509) 376-4919.

Sincerely,

Pamela S. Innis
Unit Manager

Enclosure

cc: D.R. Jensen, Ecology
D.C. Nylander, Ecology
B.A. Austin, WHC
A. DeAngeles, PRC
B. Drost, USGS
Administrative Record, 200 North



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INTRODUCTION

The U.S Environmental Protection Agency (EPA) has completed the review of the *200 North Source Aggregate Area Management Study Report, Draft A (DOE/RL-92-17)* for the Hanford Site located in Richland, Washington. The document was prepared by the U.S. Department of Energy and is dated August 1992. The comments presented below are based on a technical review of the report. General comments are presented first, followed by specific comments and typographical errors.

GENERAL COMMENTS

In general, the report adequately addresses the scope of the 200 North Source Aggregate Area management study. However, some deficiencies were found. Although facility, process, and operational history descriptions are thorough, some additional information on waste types and extent of contamination is needed, as discussed in the specific comment section of this report. Other remedial options such as incineration or electrokinetics should be considered for treatment of mixed wastes for the 200 North Source Aggregate Area. A wide variety of wastes can be incinerated, resulting in a volume reduction of 100 to 1, and improving the waste form. Also, bench scale studies have demonstrated that mixed wastes can be removed efficiently from fine grain deposits by application of electrical currents across electrodes inserted in a soil mass. A pore fluid is supplied at the electrodes, creating an electrolysis reaction. The combination of chemical, hydraulic, and electrical potential differences generated results in contaminant desorption, transport, and removal (EPA 1992).

SPECIFIC COMMENTS

1. **Executive Summary, page ES-3, line 33**
It is noted in this paragraph that the use of 200 North started in 1945, yet Chapter 2 information puts the starting date at 1944. This inconsistency should be corrected.
2. **Executive Summary, page ES-3, line 35**
The text should be clarified to state that the storage of fuel elements at the 200 North Area was found to be unnecessary since adequate storage times could be accomplished at the reactor facilities.
3. **Acronyms and Abbreviations, page xii, ASIL acronym**
Should "acceptable source..." be "ambient source..."? Page 6-7, lines 25 and 26 note this as "ambient source...". Correct this inconsistency.
4. **Section 2.2, page 2-2, line 23**
The "acceptable concentration" for iodine-131 should be defined.

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5. **Section 2.2, page 2-3, lines 6-10**
The text describes the other uses of the three 200 North storage facility buildings. The dates of service should be noted here.
6. **Section 2.2, page 2-3, lines 9-10**
It is stated that the 212-R Building was used as a railcar maintenance shop. In the Executive Summary, usage is stated as maintenance on "radioactively-contaminated" railroad equipment. This inconsistency should be resolved.
7. **Section 2.3, page 2-4, line 39**
Tables 2-2 and 2-3 summarize the types of radiological wastes disposed to the waste management units and should be noted as such.
8. **Section 2.3.1.1.4, page 2-8**
The date that the 212-R Building was placed on laid-away status should be given.
- Section 2.3.1.1.2 states that the 212-R building was used to store wooden boxes containing hoods etc. This information should be restated in this section.
- Delete the sentence beginning with "Outside of the..." in line 42 and continuing on to page 2-9. This subject is explained in Section 2.3.1.1.6 and may cause confusion in its present context.
9. **Section 2.3.1.1.6, page 2-9, lines 24 and 25**
If any further information has developed concerning the zone of underground contamination at Well House 2, it should be included in the final document.
10. **Section 2.3.2.1, page 2-10**
The current use for the 212-P Transformer Oil Tank is given. The previous use should be given.
11. **Section 2.3.5.1, page 2-11**
The last sentence of this section states that the current posting of the pond may not meet WHC requirements. This is true of the next two sections. The paragraph should state at a minimum the actions that are being taken to remedy this situation.
12. **Sections 2.3.5.4 through 2.3.5.7**
Sections 2.3.5.4, 2.3.5.5, 2.3.5.6, and 2.3.5.7 provide the deactivation dates for these trenches. These dates are the same dates shown on Figure 2-9 as operation beginning dates for these trenches. Start-up and deactivation dates should clearly be identified.
13. **Section 2.3.5.4, page 2-12, line 13**
If any references are available concerning the "special tests" they should be noted in the text. Also similar text dealing with the "special tests should be included in Section 2.3.1.1.2.

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14. **Section 2.3.9, page 2-15**

This section notes that several pits are located near the 212-P Building yet the figure shows only one large pit. Clarification should be made.

15. **Section 2.3.10, page 2-15**

Further details on the quantity and type of contamination should be noted in this section, if available.

16. **Section 2.3.10.2, page 2-15**

See Comment 11.

17. **Section 2.4.1, page 2-17**

The second paragraph on this page states that storage of fuel elements at 200 North was found to be unnecessary. This statement must be expanded to explain why storage at 200 North was unnecessary.

The third paragraph states that the water exposed to the fuel elements could have been contaminated through particulate contamination. Examples or a list of possible contaminants should be given.

The fourth paragraph, last sentence states that radioactivity may be from other sources. The other sources should be defined.

18. **Section 2.7, page 2-19, second paragraph**

See Comment 6.

19. **Section 2.7, page 2-20, lines 3-5**

The text recommends that the surface contamination zone at 212-R be evaluated according to WHC MRP criteria. This issue should be resolved and the text revised.

20. **Figure 2-1, page 2F-1**

This figure shows a number of facilities which are not included on Plate 1 (251-N, -P, and -R electrical substations and 212-P Hazardous Waste Staging Area). These should be included on the plate.

21. **Table 2-1, page 2T-1a**

The table contains waste management units which are not shown on Plate 1 (212-P Hazardous Waste Staging Area and 212-P Transformer Oil Tank). These should be included on the plate.

22. **Table 2-4, page 2T-4**

The meaning for the symbol "NA" should be noted in the table.

23. **Table 2-5, page 2T-5**

This table lists trichloroethylene and PCBs under semivolatile organic compounds (SVOCs). These compounds are not SVOCs, and should be listed as volatile organics and PCBs, respectively.

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24. **Section 3.3.1, page 3-4, lines 24-25**
It is stated that perhaps <1% of precipitation becomes recharge. Recent recharge modeling indicates 4 to 6% (Bauer and Vaccaro, 1990, USGS WRI 88-4108).
25. **Section 3.3.3, page 3-5, lines 31 and 32**
The source for the large quantities of water introduced into Gable Mountain Pond and 216-B Pond should be stated.
26. **Section 3.4.3, page 3-15, lines 16-18**
It is stated that the logs for the 200 North Aggregate Area were reviewed but considered too generalized to add significant value to the cross sections.
- One 200-N well was used in section G-G' (699-55-60B).
- The available logs for the 200-N area indicate a significant slope on the basalt surface (dipping from the west to the east). Although these logs are inadequate to supply significant detail to the unconsolidated units, they are more than adequate to indicate the top of the basalt. An additional cross section (west to east through 200-N) would be an improvement.
27. **Section 3.4.3.1, page 3-15, line 28**
State the direction that the basalt dips under 200 North.
28. **Section 3.4.3.5, page 3-17, line 2**
It is unclear whether the statement regarding silts refers to the sand dominated facies or the sandy sequence. Clarify.
29. **Section 3.4.3.5, page 3-17, lines 23 and 34**
The thickness of the upper gravel sequence in 200-N is alternately given as 23 and 40 m. Figure 3-30 indicates as much as 70 m. This discrepancy should be corrected.
30. **Section 3.4.3.5, page 3-17 and 3-18**
The last three paragraphs of this section are confusing and need clarification. Lines 40 and 41 explain that the truncation of the contours indicated in the figures are typical of the Hanford formation resulting from the depositional environment. The second to the last paragraph continues with this thought and explains that channelling from the floods caused such abrupt contacts. The last paragraph, however, basically states that the afore mentioned information can be disregarded and that most abrupt contours are a result of insufficient information.
31. **Section 3.5.3.1.1, page 3-29, lines 8-11**
It is stated that the thickness of the vadose zone in 200-N varies from about 115 ft in the west to 100 ft in the east. With land-surface altitudes of about 580 ft in the west and 570 ft in the east, and water-table altitudes of about 420 and 405 ft, respectively, the vadose zone thickness apparently varies from about 160 to 165 ft.
32. **Section 3.5.3.3, page 3-30, lines 16-18**

The meaning of this sentence is not clear. Clarify what is meant by the erosional window being "adjacent to" the aquifers.

33. Section 3.6.2, page 3-36, lines 21 & 22

This statement is incorrect. Though the Hanford Site currently is a controlled area, future site use and restrictions have not been determined. This statement should be revised or deleted.

34. Figure 3-14, page 3F-14

200 North should be labeled on this figure.

The primes (') were left off of the cross-section labels (C', E', and G').

Well 699-55-60B (at the north end of G-G') was mislabeled as 699-53-60B.

The well at the south end of G-G' is labeled 699-36-61B on this figure and 699-36-61A on figure 3-18.

The dark patch at the top of the figure (assumably West Lake) should be labeled.

The shaded areas depicting basalt outcrops are not well defined and should be shaded darker.

Wells 699-55-60A and 699-55-60b should be included in the figure.

35. Figure 3-18, page 3F-18

The note below well 699-55-60B indicates that the top of the basalt may actually be much higher than indicated by the log. In Fecht and Lillie (1982), the log indicates sand and gravel to the bottom of the hole. Also, pumping test information (August 16-17, 1944) indicates a specific capacity of between 11,000 and 34,000 gpm/ft; far in excess of what would be expected from basalt.

The water table is not indicated in the section. Are there no data or was it inadvertently left out?

36. Figure 3-30, page 3F-30

The figure would be improved by indicating the areas where the unit can not be differentiated from the rest of the Hanford Formation versus where it is not present. In particular, the unit appears (from the figure) to be almost completely absent in 200-N when in actuality it just can't be differentiated.

37. Figure 3-31, page 3F-31

The figure indicates a Hanford thickness of about 60 m in eastern 200-N. However, the available well data (699-55-60B) indicate that the thickness is at least 88 m.

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38. **Figure 3-32, page 3F-32**
The figure (although generalized) is somewhat misleading. It indicates that saturated conditions found in the Hanford Formation represent perched ground water. This is not necessarily the case. The figure should be clarified.
39. **Section 4.1.1.1, page 4-3, lines 15-17**
The text gives the distance to 200W but not to 200E or 200-IU-6. Incorporate the distances to these areas.
40. **Section 4.1.1.2.3, page 4-5, line 6**
The reference for the off-site sampling for background concentrations should be given here.
41. **Section 4.1.1.2.1, page 4-4, lines 13-15**
This section states that no radiation levels above background were detected in 200 North. The level for background should be noted in the text.
42. **Section 4.1.1.2.1, page 4-4, lines 17-19**
The text identifies the primary areas of underground contamination as the 216-N-4 and 216-N-6 ponds. Figure 4-2 shows areas adjacent to 212-P and 212-R as areas of contamination. The figure should be redone to accurately represent the contamination associated with the ponds.
43. **Section 4.1.1.2.1, page 4-4, lines 23-26**
Identify the "one known area of surface contamination" in the text.

Identify the seven units which are surveyed quarterly and give justification explaining why surveys are not performed at other waste site areas.
44. **Section 4.1.1.2.2, page 4-4, lines 39-40**
Provide a reference for available data for B Plant and U Plant.
45. **Section 4.1.1.4, page 4-5, line 20**
Following the word "reactor", add "(N Reactor)" to clarify the text.
46. **Section 4.1.1.4, page 4-5, lines 24-25**
It is stated that biota samples were collected from one site. However, two sites are listed in table 4-7.
47. **Section 4.1.1.4, page 4-5, line 26**
It is stated that samples were taken at site 83. However, the table lists sites 83 and 84 (216-N-6 Pond).
48. **Section 4.1.1.4, page 4-5, lines 26-30**
This section refers to Table 4-7 and compares levels of detected radionuclides in biota samples to background levels. This section should discuss all analytes that were detected. Background levels for K-40, PB-212, and Zr Nb-95 should be

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provided. Also, the reference for the background results should be provided in the text.

49. **Section 4.1.1.5, page 4-5, first paragraph**

No information is given as to the reasoning behind excluding the water wells (699-55-60A and 699-55-60B) from consideration for geophysical logging.

50. **Section 4.1.1.5, page 4-5, line 34**

It is stated that records indicate four wells have been completed in the 200-N area. McGhan (1989) indicates seven wells (all completed between 1943-44).

51. **Section 4.1.1.5, page 4-5, line 36**

It is stated that all wells have been filled in and are therefore unavailable for borehole logging. McGhan indicates that two wells still exist (699-55-60A and -60B).

52. **Section 4.1.1.5, page 4-6, lines 7-8**

In addition to the conservative assumptions regarding the calculation, there is a non-conservative assumption. The calculation assumes that there was zero water content in the soil before introduction of the effluent; this is a non-conservative assumption.

53. **Section 4.1.2.5.1, page 4-7, line 21**

Section 2.3.5.1 indicates that the 216-N-1 Pond was covered with 2 to 6 feet of backfill. The sampling event in 1973 indicates that the sampling interval was 6 feet deep. Consideration should be given to the fact that the crib may not have been sufficiently sampled to remove it from radiation zone status.

54. **Section 4.1.2.5.2, page 4-7**

The text in line 35 gives the level of radiological contamination in ct/min. Section 4.1.1.5, page 4-6, line 21 gives the level of radiological contamination for the same sampling event (1973) in mrem/hr. This discrepancy should be corrected.

Line 37 notes surveillance is done semiannually. This should read "Radiological surveillance...".

55. **Section 4.1.2.5.3, page 4-7 and 4-8**

The results of the 1973 sampling event should be given in this section.

Line 4 notes surveillance is done semiannually. This should read "...surveyed for radiological contamination semiannually".

56. **Section 4.2.2.1.1, page 4-14, lines 1-6**

The text discusses depth of release as a factor in determining whether contaminants reach the unconfined aquifer. Any conclusions should be included in the text.

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57. **Section 4.2.2.1.2, page 4-14, lines 15-16**
It is stated that the natural precipitation recharge in 200-N is likely to fall at the bottom of the 1-10 cm/yr range. Coarse soils (combined with little or no vegetation) tend to yield the high recharge rates. The soils in 200-N are presumably very coarse, if vegetation is sparse at the waste sites, recharge probably is nearer to the high end of the range. A description of the surface cover (soil and vegetation) should be included to support recharge estimates.
58. **Section 4.2.2.3, page 4-17, lines 38-40**
The first sentences states that the ponds have been deactivated and backfilled. The second sentence makes the same statement yet gives approximate backfill depths. Please delete the redundant statement.
59. **Section 4.2.2.2, page 4-17, lines 34-36**
The text states that overall fugitive dust emission from the 200 North Aggregate Area are relatively minor because of the presence of clean cover soil. The extent of the clean cover soil should be mentioned.
60. **Figure 4-1, page 4F-1**
The footnote in the figure indicates that the 200 North Area is outlined in red. The text in Section 4.1.1.2.1 states that only 2/3 of 200 North is represented. Clarify the footnote.
61. **Figure 4-3, page 4F-3**
There should be arrows connecting "Trenches" and "Unplanned Releases" (under "Waste Sites" column) with "Volatilization" under the "Release Mechanisms" column.
62. **Tables 4-3 and 4-4, pages 4T-3 and 4T-4**
The tables should note that the values given in the far right column are average values, not total values as note in Table 4-4.
63. **Table 4-13 (Contaminates of Potential Concern), page 4T-13**
This table does not list Polychlorinated Biphenyls. Incorporate this contaminate into the list and reflect this in the entire document. Even though Section 4.2.4, page 4-23 lines 6-8, state PCB's are eliminated because they are managed by an active Toxic Substance Control Act, Ecology disagrees. This alone does not justify not sampling and listing as a potential contaminate of concern. Section 4.1.2.1, page 4-6, second paragraph, says that drums containing PCB's are stored on the western most pad of the 212-P building, therefore the likelihood of spills exists. Secondly, Section 4.2.3, page 4-19, lines 7-10, states PCB contamination exists, which contradicts the whole basis for not sampling. Clarify and incorporate PCB's in this document.
64. **Tables 4-17 & 4-18, pages 4T-17a - 4T-18b**
The tables indicate different half-lives for 241 Am. The correct half-life is 432 years. Correct Table 4-18 to reflect this change.

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65. **Table 4-17, page 4T-17b**
This table incorrectly list the half-life for 90 Y as 6.41 hours. Correct the table to reflect the half-life as 64.1 hours.
66. **Section 5.3, page 5-7, lines 12 and 37**
The text states that two units received "a qualitative high" score using the HRS scoring procedure. Table 5-1 shows only one unit receiving a high score. This inconsistency should be addressed and the text corrected.
67. **Section 7.4.7, page 7-15, first paragraph**
The beginning sentence and the last sentence of the paragraph contradict one another. One sentence says VOC do not exist while the other says they exist. Clarify and correct the paragraph. Also, if VOC's do exist, then a change to Section 7.5, page 7-16, line 15, deleting the word "not" must follow. Another section which contradicts the belief that VOC's don't exist in the 200 North Area is Section 9.5, page 9-18, line 36.
68. **Section 7.5, page 7-16; and Table 2-5, page 2T-5**
This section states that no sites at the 200 North Aggregate Area are contaminated with volatile organic compounds. However, Table 2-5 lists acetone and trichloroethylene among the chemicals disposed of at this site. This discrepancy should be resolved.
69. **Table 7-4, pages 7T-4a and 7T-4b**
The rational behind the exclusion of Alternative 4 (in-situ vitrification) and Alternative 5 (Excavation, Treatment and Disposal of TRU Soil) for the Ponds and Ballast Pits is needed. Data are not sufficient to eliminate these alternatives at this time.

The rational behind the exclusion of Alternative 5 (Excavation, Treatment and Disposal of TRU Soil) for the Unplanned release at Wellhouse 2 is needed. Data are not sufficient to eliminate this alternatives at this time.
70. **Section 8.1.2, page 8-5, lines 21-23**
See Comment 26.
71. **Table 8-4, pages 8T-4a to 8T-4d; and Table 2-5, Page 2T-5**
Table 2-5 lists radionuclides and chemicals disposed of at the 200 North Aggregate Area. However, some of these analytes are not listed in Table 8-4 for chemical/radionuclide analyses. These analytes include astatine-217, barium-137, cerium-141, cobalt-57, francium-223, iodine-131, iron-59, lanthanum-140, manganese-54, niobium-95, and trichloroethylene.
72. **Table 8-5, page 8T-5**
Table 8-5 should include a list of all analytes of concern that are known to be present at this site.

73. **Table 8-6, page 8T-6a**
Justify using analogous facilities for the characterization of the ponds and trenches.
74. **Section 9.2.1, page 9-9, line 32**
Explain the significance of "100 times the reportable quantities and quality standards".
75. **Section 9.3.3, page 9-16, lines 21 - 23**
This sentence notes possible contamination from sand blasting and decontamination activities. These activities are noted briefly in previous sections but relative information should be expanded if they are potential sources of contamination.

TYPOGRAPHICAL ERRORS

Section 3.4.3.3, page 3-16, line 4
Delete comma.

Section 3.5.3.1.1, page 3-29, line 11
"Figure 3-34" should be "Figure 3-35".

Section 3.5.3.1.1, page 3-29, line 15
Swanson et al. 1988 is not on the reference list.

Section 3.5.3.2, page 3-30, line 11
"Figure 3-34" should be "Figure 3-35".

Figure 3-17, page 3F-17
In the note; "complsed" should be "composed" and "internal" should be "interval"

Figure 3-18, page 3F-18
In the note; "complsed" should be "composed" and "internal" should be "interval".

Section 4.1.1.4, page 4-5, line 27
Change the word "yhe" to "the".

Section 4.1.1.5, page 4-6, line 21
This line contains a misspelling of mrem/hr as mrep/hr. This error should be corrected.

Page 4-7, line 27
Change "At" to In, and add a comma after the word "survey".

Page 4-7, line 37
Change "At" to In.

Page 4-8, line 4
Change "At" to In.

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Page 4-8, line 9

Change "At" to In, and add comma after the word "survey".

Page 4-8, line 14

Change "At" to In, and add comma after the word "survey".

Page 4-8, line 19

Change "At" to In, and add comma after the word "survey".

Page 4-8, line 24

Change "At" to In, and add comma after the word "survey".

Page 4-10, line 4

Place a comma after the word "fittings".

Table 4-4, page 4T-4

Schmidt et al. 1991 and 1992 are listed as 1992a and 1992b on the reference list.

Table 4-6, page 4T-6

Which reference (1992a or 1992b) is Schmidt et al. 1992 referring to?

Table 4-7, page 4T-7

Which reference (1992a or 1992b) is Schmidt et al. 1992 referring to?

Table 4-9, page 4T-9

Which reference (1992a or 1992b) is Schmidt et al. 1992 referring to?

Table 4-18, page 4T-18b

Which reference (1991a or 1991b) is EPA 1991 referring to? (4 instances)

Table 4-19, page 4T-19

Trichloroethylene is misspelled as Trichloroethyiene.

Page 5-7, line 3

Delete the word "of" at end of sentence.

Section 5.3, page 5-7, line 6

Huckfeldt 1991b; only Huckfeldt 1991 is on the reference list.

Table 5-1, page 5T-1b

Delete the word "visit" from the b/footnote.

Section 6.2, page 6-2, line 40

Table 4-23 does not exist. The correct table is Table 4-13.

Page 9-9, line 24

Change the word "which" to "that".

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Section 10, page 10-1, Ault reference
"Old Creek Syncline" should be "Cold Creek Syncline"

Table A-1, page AT-1b
Is Schmidt et al. 1992, a or b?

Table A-1, page AT-2b
Is Schmidt et al. 1992, a or b?

Table A-4, page AT-4c
Is Schmidt et al. 1992, a or b?

Section 5.2, page D-11, line 16
WHC 1990 is not on the reference list.

REFERENCES

EPA 1992. Radioactive Site Remediation Technologies Seminar.
United States Environmental Protection Agency. June 1992.

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