0021528

United States
Environmental Protection
Agency

Region 10
Hanford Project Office
712 Swift Boulevard, Suite 5
Richland WA 99352

9203126

EPA

May 7, 1992

Billie Mauss
Unit Manager/Chemist
Washington State Department of Ecology
7601 W. Clearwater, Suite 102
Kennewick, WA 99336

Re: S Plant AAMSR Review

Dear Ms. Mauss:

The U.S. Environmental Protection Agency, as a support agency, has reviewed the S Plant Aggregate Area Management Study Report. Attached are the comments in both printed and diskette formats.

If you have any questions, please contact me at (509) 376-4919.

Sincerely,

Pamela S. Innis

Pamela S. Innis
Unit Manager

Enclosures

cc: Larry Goldstein, Ecology

1 JUN 1992
RECEIVED
EDMC

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) reviewed the S Plant Aggregate Area Management Study Report for the Hanford Site, Richland, Washington Draft A (DOE/RL-91-60). The document dated March 1992, was prepared by the U.S. Department of Energy (DOE). The comments presented below are based on a comprehensive technical review of the report. General comments are presented first, followed by specific comments.

GENERAL COMMENTS

Some inconsistencies in the text and tables were found throughout the report. These inconsistencies are addressed in the specific comments section of this technical review.

The chemical waste inventory summary is incomplete. Many organic and inorganic chemicals were used in the process and were ultimately disposed of in the cribs, ponds, trenches, and ditches on site. Data are lacking for these chemical wastes.

The source description for each waste management unit is not sufficient for understanding the characteristics of wastes disposed of at these units. Additional information on the composition of wastes received at the waste management units should be included.

In the recommendations section of the report, a summary table should provide the following information:

- Redefined waste management units group
- Recommended action
- Redefined operable unit category
- Interface with other programs such as the Radiation Area Remedial Action program (RARA) and RCRA

- Waste management units not grouped
- Waste management units that are covered under other programs such as RARA, RCRA, defense waste management and Hanford surplus facilities programs, single- and double-shell tank programs, and other aggregate area management studies
- Investigation priority

SPECIFIC COMMENTS

1. Section 1.2.1, page 1-4, lines 26 through 28

Figures 1-3 and 1-4 are referred to as showing the eight source aggregate areas in the aggregate area management study (AAMS) program. The eight source aggregate areas include the source operable unit 200-NO-1, which is located in the 200 North aggregate area (Table 1-1). The cited figures show only the 200 East and West aggregate areas. A separate figure for the 200 North aggregate areas, showing the 200-NO-1 source operable unit, should be included and the text should reference this figure for the 200 North aggregate areas.

2. Section 1.2.1, page 1-4, lines 29 and 40

The rationale for not including isolated operable units, with the exception of 200-IU-6, in the AAMS is not provided and should be.

3. Section 1.2.2, page 1-6, lines 1 through 3

The text states that a separate report for step 3 (conduct limited field characterization activities) will be prepared. Since step 3 is included in the scope of the AAMS and is a parallel effort in the AAMS, the completion date for step 3 should be indicated in this report.

4. Section 1.2.2, page 1-7, lines 13 and 28

The data packages for geologic and geophysics and groundwater field characterizations should indicate the specific plant, facility, and operable unit to which the data packages refer.

5. Section 1.2.2, page 1-8, lines 3 through 16

A reference document for regulatory agency approval for expanded groundwater monitoring programs and in situ assaying of gamma-emitting radionuclides as part of the AAMS process should be cited. The date for submission of field characterization results topical reports for each AAMS should be presented.

6. **Section 1.2.2, pg. 1-8, line 37**
The word "retain" should be "remain".

7. **Section 1.3, page 1-10, lines 8 and 9**

Since field screening activities are a part of the AAMS process (page 1-8, lines 3 and 4), deliverables for an AAMS should also include topical reports for field characterization results.

8. **Figure 1-5, page 1F-5**

The 200-NO-1 source operable unit is incorrectly identified as an isolated operable unit. This discrepancy should be corrected.

9. **Section 2.1, page 2-1, lines 31 through 33**

The S plant aggregate area operable units are incorrectly reported as 200-UP-1, 200-UP-2, and 200-UP-3 instead of as 200-RO-1, 200-RO-2, 200-RO-3, and 200-RO-4 (Table 1-1). This discrepancy should be corrected.

10. **Section 2.2, page 2-2, line 34**

Definitions for the acronyms SX and SY should be provided.

11. **Section 2.3.1.1.1, page 2-5, line 10**

The type of material stored in the Canyon and the active period of the area should also be stated.

12. **Section 2.3.1.2.1, page 2-6**

It is not clear from the text whether the 204-S pumphouse or the 204-S tank farm with above-ground storage tanks was converted for unloading radioactive waste from rail tank cars and for storage of thorium nitrate solution. The period of operation for the 204-S pumphouse and 203-S and 204-S tank farms should be included. It is not clear whether the 204-S pumphouse is existing or if it has been removed. Additional information on the date of removal and the disposal of removed material should be provided for the 203-S and 204-S tank farms.

13. Section 2.3.1.2.2, page 2-6

The date of removal and the disposal of removed material for the 205-S building should be included.

14. Section 2.3.1.2.3, page 2-6

The type of process chemicals stored in the wooden valve house should be clearly specified. Information on the condition of the wooden valve house and its active period should be provided.

15. Section 2.3.1.2.4, page 2-6

Information on the treatment steps used, the types of wastes historically handled and generated, and the capacity of the 219-S waste retention and treatment facility should be included.

16. Section 2.3.1.2.10, page 2-7

Additional information on the process steps, process chemicals used, and on the generation and disposal of waste from the treatment of methyl isobutyl ketone (MIBK) should be included.

17. Section 2.3.1.2.14, pg 2-7

Additional information should be given for the 2704-S Monitoring House. A site visit or current or past employee interview may yield additional information.

18. Section 2.3.1.2.11, page 2-7

The text should provide information on the frequency of replacement of sand and gravel in the filter and on the disposal of contaminated sand and gravel.

19. Section 2.3.1.2.12, page 2-7

The approximate amount of waste generated from washing the inner liner of the 291-S stack complex and final disposal of washdown waste should be presented.

20. Section 2.3.2.1, page 2-9

In lines 19 and 20 the sentence should read that the "tops" and not the "bottoms of most tanks...".

In lines 27 and 28, the text states that the cascade systems are composed of three tanks each, but it appears from the tank numbers shown in parentheses that five tanks (108-112) were placed in one cascade. Also, tank 106 appears to be listed in two cascades. These discrepancies should be addressed.

The text in lines 40 and 41 states that radiation intensities should be lower as the wastes move down the cascade. This statement may not be true. The tanks are not always operated in series as originally arranged in a system of cascades. Sections 2.3.2.1.1 through 2.3.2.1.12 discuss the different type of waste received and the operating period for the individual single-shell tanks. Since these tanks receive both effluent from other tanks and liquid wastes directly from sources, radiation intensity in these tanks is expected to be very high.

21. Section 2.3.2.1.2, page 2-10

The total estimated volume (779,000 gallons) of interstitial liquid and solids currently stored in the 241-S-102 single-shell tank exceeds the capacity (750,000 gallons) of the tank. This discrepancy should be rectified.

22. Section 2.3.2.1.10, pages 2-11 and 2-12

The total estimated volume (752,000 gallons) of interstitial liquid and solids currently stored in the 241-S-110 single-shell tank exceeds the capacity (750,000 gallons) of the tank. This discrepancy should be rectified.

23. Section 2.3.2.2, pg 2-12, lines 43 and 44

This sentence should read that the "tops" and not the "bottoms of most tanks...".

24. Section 2.3.2.2.1, page 2-13, second paragraph

The text should state whether the reported temperatures in the tank were measured before or after the unit was connected to the 241-SX sludge cooler.

25. Section 2.3.2.2.2, page 2-14

In line 3, concrete is included as a waste received at tank 241-SX-102 (as in some other single shell tanks). Additional information on this waste, such as its source and form, should be included.

The statement on pumping the waste to a "minimum supernatant heel" is not clear and should be explained.

26. Section 2.3.2.2.4, page 2-14 and 2-15

It is not explained how a leak of 110,000 gallons of liquid was detected when the dry well radionuclide monitoring results remained stable. This information should be included.

27. Section 2.3.2.2.5, pg 2-15, line 25

The review period should be defined or referenced.

28. Sections 2.3.2.2.7, 2.3.2.2.9, and 2.3.2.2.12, pages 2-16 through 2-18

Information on the dates of removal from service of the leaking tanks and the action taken to control the leaks should be included.

29. Section 2.3.2.4, page 2-20, lines 17 and 18

The tank identification numbers should be provided for the wastes transferred from catch tanks to storage tanks.

30. Section 2.3.2.4.2, page 2-20

The year of removal from service of the 241-S-302A catch tank and the location of the 241-S-304A catch tank should be specified.

31. Section 2.3.2.4.3, page 2-20

The location of the 241-S-302B catch tank is incorrectly reported. This tank is located on the northeast side, not west, of the 241-S tank farm. This discrepancy should be corrected.

32. Section 2.3.3.1, pages 2-22 through 2-24

In line 8, Figure 2-9 should be substituted for Figure 2-6. The text refers to Figure 2-8 and the 202-S building to locate the cribs. The 202-S building is not shown on the map.

The text in the second paragraph states that the 216-S-1 and -2 facilities received cell drainage wastes from the D-1 receiver tank and redistilled condensate from the D-2 receiver tank. Additional information on the source, strength, and characteristics of these wastes and the functions of the D-1 and D-2 receiver tanks should be provided.

33. Section 2.3.3.1, page 2-22, line 9

The location of the 202-S Building should be depicted in either Figure 2-2 or Figure 2-8.

34. Section 2.3.3.1, page 2-22, line 41

The intent of this sentence is unclear.

35. Section 2.3.3.1, pg 2-23, line 2

The measurement 16 x 33 ft should also be given in meters.

36. Section 2.3.3.1, pg 2-23, line 11

Units should be given for the number 60.

37. Section 2.3.3.1, pg 2-23, line 15

Units should be given for the number 20.

38. Section 2.3.3.1, pg 2-23, lines 25-27

The last part of this sentence, "and was moved deeper into the profile before driving the casing deeper" should be clarified.

39. Section 2.3.3.2, page 2-24

The 207-S retention basin is noted in reference to the 216-S-5 crib location shown on Figure 2-8. The 207-S retention basin is not shown on the map. This comment is applicable to subsequent sections.

The specific process vessels or sources from which the acidic process vessel cooling water and steam condensate are generated and the nature of these wastes should be explained elsewhere to better evaluate the type of contaminants disposed of at the crib.

The basis for the reported volume of contaminated soil should be presented. This comment is applicable wherever appropriate in other sections.

It seems that the radioactivity for the localized spots mentioned in line 27 should reflect hot spots. A reading of 17 mR/h does not reflect this.

In lines 38 through 40, it is stated that breakthrough to groundwater is unlikely to have occurred in the vicinity of the crib based on a review of radiation data for sediments beneath the crib. Conversely, it is reported in Table 4-14 that there is a potential for migration of contaminants to the unconfined aquifer. This inconsistency should be rectified. Because of the highly acidic native and the large volume of waste disposed of through this crib, it is likely that the contaminants would have been in soluble form and would have migrated to groundwater during infiltration, in addition to being deposited in sediments beneath the crib.

40. Section 2.3.3.3, page 2-25

The text states that the crib received a total of 1.18×10^9 gal of low salt, natural/basic liquid waste. It then states that the site received the process vessel cooling water and steam condensate. In the third paragraph, it states that the site received high-level radioactive contaminated condensate. It is not clear whether the total amount of waste includes the amount of cooling water and steam condensate. This ambiguity should be clarified. Also, the text should explain the sources of the low salt, neutral/basic liquid wastes and high-level condensate, and include a description of low salt, neutral/basic liquid wastes in Section 2.4.

The basis for suspecting only contaminants Cs-137, Sr-90, Ru-106, and nitrate should be provided. This comment is applicable wherever appropriate for other sections.

In the second paragraph, the text indicates that a runoff ditch is provided for temporary excess flows at the crib. Additional information on the size of the run-off ditch and the amount of excess flows, if any are received, should be provided.

41. Section 2.3.3.4, pages 2-25 and 2-26

The generation rates and characteristics of all drainage and process condensates and the functions of the D-1 and D-2 receiver tanks and the H-6 condenser should be provided in Section 2.4.

The specific location and tank (single-shell or double-shell tanks) to which the H-6 condenser condensate was rerouted for storage should be included.

The approximate volumes of gravel fill, contaminated soil, and overburden soil are not reported for this crib. To be consistent with other sections, this information should be included. This comments is applicable wherever appropriate.

42. Section 2.3.3.7, pg 2-28, line 15

The statement "the ground was filled in" should be revised to give a more accurate account of the procedure.

43. Section 2.3.3.10, pg 2-30, line 4

This paragraph should identify under which program 216-S-25 Crib is handled.

44. Section 2.3.3.11, pg 2-30, line 30

A reference or value should be given for the ^{90}Sr guide.

45. Section 2.3.5.1.2, pg 2-32, line 45

A reference should be given for the boring sampling event.

46. Section 2.3.5.1.3, pg 2-33, line 8

This paragraph should identify under which program 216-S-11 Pond is handled.

47. Section 2.3.5.1.5, pg 2-36, line 34

Clarification should be given as to the reference of this source of contamination.

48. Section 2.3.5.1.5, pg 2-36, lines 41 and 42

The last sentence of this paragraph should be deleted.

49. Section 2.3.5.1/5, pg 2-37, line 1

The sentence is incomplete. "Addition of" should be added to the beginning of the statement.

50. Section 2.3.5.1.6, pg 2-38, line 22

A reference should be given for the prescribed disposal guidelines.

51. Section 2.3.9.2, pg 2-51, line 39

If an unknown amount of waste was buried in the burial ground can it be certain that the total beta activity is less than 0.1 Ci. A reference should be given.

52. Section 2.4, page 2-52

This section should include a subsection for wastes generated from decommissioning and decontamination operations including the methods, equipment, the chemicals used, waste generated, and the waste management units that received the wastes.

53. Section 3.3.1, pg 3-4, lines 13-15

It is noted that surface drainage from the Horse Heaven Basin enters the Pasco Basin. As shown in Figure 3-7, the Horse Heaven Basin does not drain into the Pasco Basin.

54. Section 3.5.2.4, pg 3-25, line 36

The text indicates that Figure 3-40 presents information on the groundwater mounding beneath the 200 Areas. The correct figure is Figure 3-42.

55. Section 3.5.2.4, pg 3-25, line 38

It is noted that the horizontal hydraulic gradient is expected to increase as the 200 West mound continues to dissipate. The gradient should actually decrease.

56. Section 3.5.3.1.1, pgs 3-26 and 3-27

Moisture content is described in terms of volume in the text and in Figures 3-40 and 3-41, but as moisture content by weight percent in the table on page 3-27. Units should be consistent in the report for comparison.

57. Section 3.5.3.1.1, pg 3-26, line 19

The text references Figure 3-41. The correct reference should be Figure 3-42.

58. Section 4.1, pgs 4-1 to 4-2, lines 46 & 1 respectively

The statement that the list of potential chemicals "does not necessarily include wastes that may have originated in the S plant Aggregate Area or other areas of the Hanford Site" is unclear.

59. Section 4.2.2.1.4, pg 4-36, line 9

The second reference to Cobalt 60 should be changed from ^{60}CO to ^{60}Co.

60. Section 4.2.3, Figure 4-3 and Plate 4

Both of the conceptual model figures depict arrows in both directions between humans and biota through the ingestion exposure route. The arrow should only indicate a transfer from biota to humans.

61. Table 5-1, page 5T-1a

Reference documents should be cited for the reported hazard ranking system (HRS) scores for the S plant aggregate area.

Also, the year data were collected for determining the HRS score should be provided.

Waste management units 216-S-13, 216-S-22, and 216-S-23 cribs are not considered as high priority sites in this table. Interim remedial measure (IRM) and limited field investigation (LFI) paths, however, are used for these sites, which indicates that they are being treated as high priority waste sites (Table 9-1).

Similarly, the 216-S-15 and 216-S-19 ponds are not considered to be high priority sites in the table but are treated as high priority sites in Table 9-1.

The 2904-S-171 control structure is considered to be a high priority site in this table but is not included in the Table 9-1.

The text in Section 5.2.1 (page 5-3, line 41) states that the 216-S-172 control structure is recommended as a high priority site; this site is not included in Table 5-1.

The text should be modified as appropriate.

62. Section 8.1.3, page 8-9, line 17

The term "S Plant" should be substituted for U Plant.

63. Section 8.2.2.2, page 8-16, lines 1 through 13

The text indicates that the data quality objective (DQO) parameters listed in Table 8-4 will be used for the development of site-specific sampling and analysis plans. Because of inadequate information on the disposal of waste constituents at the waste management units, the DQO parameters should include a full suite of CERCLA analytes (TCL and TAL) and radionuclides at least for critical samples that are to be identified for each waste management unit. Also, general physical and chemical parameters should be included in the site-specific sampling and analysis plan and quality assurance project plans.

64. Table 8-4, page 8T-4a

Subheadings and appropriate units (for example, PQL in pCi/g, precision in RPD, accuracy in %) should be included at the top of each column in this table.

References for analytical methods should be superscripted corresponding to each method or should be provided in a separate column for clarity.

65. Table 8-6, page 8T-6a

The rationale for excluding the following waste management units from characterization should be provided:

- 241-S-302 A catch tank
- 241-S-302 B catch tank
- 241-SX 302 catch tank
- 244-S receiver tank

66. Section 9.2.1, page 9-7, first-paragraph

The text states that none of the candidate units were recommended for an expedited response action (ERA), but in Table 9-1, 2904-S-160, 2904-S-170, 2904-S-172 control structures are recommended for ERA and IRM. This discrepancy should be corrected.

67. Section 9.2.2, page 9-9, second paragraph

Thirty-four candidate units are recommended for IRM, but only 23 candidate units including three control structures are listed as considered for IRM action in Table 9-1.

Also, in lines 37 and 38, data gathering is proposed for only 22 of the 34 candidate IRM units. The text is not clear whether adequate data are available for the remaining 12 IRM candidate units to support IRM action. Further, a list of the remaining 12 IRM candidate units is not provided and should be.

68. Section 9.2.3.3, page 9-12

The 2904-S-171 control structure is considered for LFI in this section but is not included in Table 9-1.

Conversely, the 2904-S-172 control structure is included for IRM in Table 9-1, but is not considered in this section. This discrepancy should be corrected.

69. Section 9.2.4.1.1, page 9-13 and Section 9.2.4.1.3, page 9-14

The 216-S-8 trench and 207-S retention basin are high priority units, but it is proposed to proceed with an RI. The text should explain why an LFI is not proposed for these units as for other high priority units where data are inadequate.

70. Section 9.2.4.2, page 9-15

No additional investigation is proposed for unplanned release UN-200-W-41. The stated reason is incorrect. The specific contaminated area is presented in Table 2-6, while the contamination attributed to this unknown release is discussed in Section 4.1.2.9.6. This site should be further assessed under an RI to confirm that no contamination exists here.

71. Section 9.3.2, page 9-16

A reference should be cited for information relating to the high-level waste transfer facilities and pipelines that are to be eliminated from the work scope.

The rationale should be provided for inclusion of the 216-S-4 French drain and the 216-S-21 crib in the 200-RO-1 operable unit. Also, the text should explain the recommended action for these sites.

72. Section 9.3.3, page 9-16, second paragraph

The text recommends investigation of cribs and French drain first and the S pond system next. It then states that the 200-RO-2 operable unit should be investigated before the 200-RO-1 operable unit, which should in turn be investigated before the 200-RO-3 operable unit. However, many of the cribs that received the largest quantities of contamination are included in the 200-RO-1 and 200-RO-3 operable units. The operable units should be redefined based on inventories of contaminants and should then be prioritized for investigation.

73. Table 9-1, page 9T-1a

Inconsistencies exist in reporting the waste management units (WMUs) for site characterization investigation methods. For example, investigation methods are proposed

for some WMUs in Table 8-1, which are not included in Table 9-1. Example include the:

- 291-S stack complex
- 240-S-302 catch tank
- 216-S-25 crib
- 216-S-26 crib
- 207-SL-retention basin

For some of the WMUs, investigation at representative analogous sites is proposed, but the analogous sites are not identified.

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
P. S. Innis, EPA	B. Mauss, Ecology	Incoming 9203126

Subject: S PLANT AAMS REPORT

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	X
		President's Office	B3-01	
		M. R. Adams	H4-55	
		L. D. Arnold	B2-35	X
		R. A. Carlson	H4-55	
		G. D. Carpenter	B2-16	
		C. K. DiSibio	B3-03	
		M. J. Galgoul	H4-55	X
		R. E. Lerch	B2-35	X
		P. J. Mackey	B3-15	
		H. E. McGuire	B3-63	
		T. B. Veneziano	B2-35	
		T. M. Wintczak	L4-92	X
		C. D. Wittreich	H4-55	
		R. D. Wojtasek	L4-92	
		EDMC	H4-22	X