

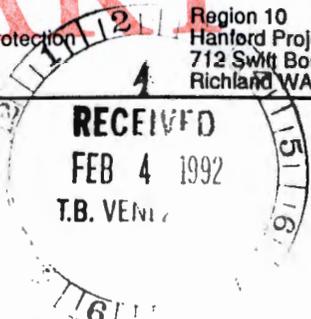
# START

United States  
Environmental Protection  
Agency

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

9200557

0018813



February 3, 1992



James D. Goodenough  
Operable Unit Manager  
U.S. Department of Energy  
P.O. Box 550, A6-95  
Richland, Washington 99352

Re: Remedial Investigation/Feasibility Study Work Plan for the  
100-KR-1 Operable Unit, Hanford Site, Richland, Washington,  
Draft D, dated September, 1991.

Dear Mr. Goodenough:

Enclosed are the comments from the U.S. Environmental  
Protection Agency (EPA) on the above referenced document.

The work plan and has been revised significantly to reflect  
the rescoping effort. In addition to the enclosed technical  
comments, EPA has concerns with the 100-KR-1 schedule. In  
particular, we believe that drilling activities associated with  
task five "Vadose Investigation" should begin upon approval of  
this work plan. The anticipated approval date for this work plan  
is May 1992. Given this, the remaining schedule should be  
adjusted to reflect the accelerated schedule for the vadose zone  
investigation.

EPA requires three interim milestones be added to milestone  
M-15-00. The first interim milestone for the 100-KR-1 Operable  
Unit will require submittal of all validated data from sampling  
activities associated with source and vadose zone investigations  
to us by July 31, 1993.

The second interim milestone will require the U.S.  
Department of Energy (DOE) to submit a draft 100-KR-1 Remedial  
Investigation report to EPA and Ecology by April 31, 1994.

The third interim milestone will require DOE to submit a  
draft 100-KR-1 Feasibility Study Report and Interim Remedial  
Measures Plan to EPA and Ecology by December 31, 1994.

A review of the schedule shows that there is no commitment  
to any remedial activity beyond the Interim Record of Decision  
(ROD). The schedule must be changed to reflect that additional  
remediation may need to occur to reach a final ROD. In addition,  
EPA does not agree that the proposed plan produced as a result of  
the 100-KR-1 RI/FS Work Plan will necessarily result in an  
interim ROD. This plan may address clean up of the entire  
operable unit and therefore result in a final ROD.

1 2 4 1 7 1 6 5 7

February 3, 1992

The schedule for the Interim Record of Decision is incorrect. The EPA is responsible for writing the Record of Decision based on the proposed plan submitted by DOE. The schedule must be changed to correct this error.

Another major area of concern focuses on the lack of detail in the Quality Assurance Project Plan (QAPjP) and field sampling activities listed in Section 5. These sections must be strengthened to support implementation of field sampling activities. Discussions held during comment resolution on the work plans for 100-BC-1 and 100-BC-5 resolved the issues concerning the QAPjP. It was agreed to at that time that the QAPjP for all future work plans would be revised based on those discussions.

The final concern pertains to the Data Management Plan. As you are aware, the EPA and Ecology are concerned with the current site-wide Data Management Plan and its ability to track and make available the large volumes of data that will be generated during the life of these projects. Since the Data Management Plan is applicable to all operable unit work plans it is suggested that the Site Wide Data Management Plan be addressed as part of appendix F to the Hanford Federal Facility Agreement and Consent Order. By doing this it will allow for more time to address the Data Management Plan issue while not impacting the approval of this work plan.

The comments enclosed have previously been transmitted to you electronically via cc:mail. If you have any questions or concerns, feel free to contact me at (509) 376-3883.

Sincerely,

  
David R. Einan  
Unit Manager

Enclosure

cc: R. Hibbard, Ecology  
D. Lacombe, PRC  
W. Staubitz, USGS  
D. Teel, Ecology  
T. Veneziano, WHC<sup>1</sup>  
Administrative Record (100-KR-1 Operable Unit)

22124171658

TECHNICAL REVIEW OF RI/FS WORK PLAN (DRAFT D)

FOR HANFORD SITE 100-KR-1 OPERABLE UNIT

1. Deficiency: Section 2.1.4.1, page WP2-5, third paragraph

Radioiodine monitoring devices are described as housed in the 1908-K building. However, Figure 2-2 shows building 1904-K housing radioiodine monitoring equipment. Table 2-2 lists both facilities housing radioiodine monitoring equipment.

Recommendation:

The discrepancies between the text, Figure 2-2, and Table 2-2 should be resolved.

2. Deficiency/Recommendation: Section 2.2.6.1, page WP2-22

This section addresses "active flora" as part of the environmental resources at the operable unit. It is unclear what distinguishes "active flora" from other flora. The term "active flora" should be explained.

3. Deficiency/Recommendation: Figure 2-6, WP 2F-6

Facies represented by solid black are shown in the geologic log to bore hole DH-19, but the nature of these facies is not identified in the legend.

4. Deficiency/Recommendation: Table 2-8, page WP2T-8a

The entire designation for each well should be used. For example, use 199-K-11 instead of K-11.

5. Deficiency/Recommendation: Table 2-9, page WP2T-9a

This table is a list of endangered and threatened flora and fauna potentially present at the Hanford Site. There is no information provided on the potential for occurrence of state-sensitive species. A reference should be made to Appendix D-2 of the rescoped work plan for the 100-KR-4 Operable Unit in which the issue of state-sensitive species is addressed as part of the area-wide ecological investigations.

22124171659

6. Deficiency/Recommendation: Section 3.3.1.3, page WP3-13

The list of environmental transport media should include the potential for introduction of contaminated soil into the riparian zone and the Columbia River through erosion processes.

7. Deficiency/Recommendation: Section 3.3.1.5, page WP3-14

This section states that "the most likely point of exposure for terrestrial biota is the plant root zone . . ." The sentence should read instead that the most likely point of exposure for terrestrial flora is the plant root zone.

8. Deficiency/Recommendation: Section 3.3.2.1, page WP3-15, last paragraph

The second sentence should clarify the meaning of "1E-06." One in a million is a value that usually describes excess lifetime cancer risk.

9. Deficiency: Section 3.3.2.2, page WP3-16

This section is incomplete and inappropriate in regard to the criteria identified by EPA (1989a) for toxicity as a contaminant characteristic. Hazardous substance designation pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (as implemented in 40 CFR 302.4) is based on frequency of detection as well as toxicity.

Recommendation:

This section should discuss the method of selection of the most toxic contaminants. EPA (1991) provides an example of a risk-based screening method.

10. Deficiency: Section 3.3.2.5, page WP3-17

This section discusses bioconcentration factors for certain 100-KR-1 contaminants, and an informational list is provided in Table 3-21. However, it is not clear why these specific bioconcentration factors are presented. That is, it is not clear if these contaminants are of special concern with respect to their ability to bioaccumulate or bioconcentrate.

Recommendation:

The rationale for providing the bioconcentration factors for the set of contaminants listed in Table 3-21 should be given.

2024171660

11. Deficiency: Section 3.3.3, page WP3-18

This section refers to the list of general contamination screening parameters applicable to the 100-KR-1 Operable Unit (Table 3-20, page WP3T-20). However, there is no rationale given for the selection of these parameters or discussion of how they will be used for screening purposes.

Recommendation:

This section should explain the need for these screening parameters and the criteria for their selection, such as the effects that physico-chemical properties might have on the behavior of the contaminants in the affected media. In addition, the section should provide an explanation of how these screening parameters will be used.

12. Deficiency: Section 3.3.3, page WP3-18

The fourth sentence discusses the fact that radioactive daughter products must be considered when evaluating human and environmental impacts of radionuclides but does not discuss how daughter products will be addressed.

Recommendation:

The work plan should discuss how impacts from daughter products will be considered during the investigation process.

13. Deficiency/Recommendation: Section 3.3.4, page WP3-18

The conclusions in this section should be supported by quantitative information such as comparison with applicable or relevant and appropriate requirements (ARARs) or risk-based screening values. If such information is not available and a comparison cannot be made, then a statement to that effect should be included.

14. Deficiency: Section 3.4.2, page WP3-21, last paragraph

The text on waste treatment is too general. It does not clearly identify the various process options for each type of waste site (i.e., solid wastes, soils, river sediments, and groundwater) as stated in Section 5.2.2.

Recommendation:

Since the contaminants of interest are known for each type of site, the preliminary waste treatment technologies should be clearly identified for solid waste and soils and should be presented in this work plan. The specific technologies for sediments and groundwater should be

presented in the work plan for the 100-KR-4 Operable Unit. Also, a brief discussion should be included on the purpose of each technology or process option in terms of contaminant reduction.

15. **Deficiency:** Section 3.4.4, pages WP3-23 and 3-24, second bullet

The text indicates that macroengineering will be conducted as a final alternative and not as an interim remedial measure (IRM). However, macroengineering is indicated as an interim remedial technology in Figure 3-11 and in the text (third paragraph, page WP3-22). It is not clear whether macroengineering removal action will be used as a final remedial action only or for both interim and final actions. Also in the last sentence, the following statement is vague and uninformative: "Macroengineering removal alternatives may be effective in meeting remedial action objectives for residential or agricultural land uses, but may be inconsistent with wildlife and recreational land uses."

**Recommendation:**

The statement on the use of macroengineering removal action for remedy selection should be consistent in the text and in the figure. Since macroengineering removal action is selected as one of the final remedial actions to meet the preliminary remedial action objectives, the manner in which macroengineering removal action may be inconsistent with the overall objectives should be explained.

16. **Deficiency:** Figure 3-10, page WP3F-10

There are several deficiencies in the contaminant exposure pathway model, as follows:

- y The figure legend shows a hexagonal symbol for primary contaminant sources and known contaminated media; however, primary sources (process effluents) and contaminated media (soil) are identified with a circle in the figure
- y The biota receptor component does not differentiate between terrestrial, riparian, and aquatic biota and fails to establish ingestion relationships among them
- y The arrow between biota and ingestion is pointed both ways

**Recommendation:**

The symbols given in the legend should be used for identification of all the appropriate components in the figure. Major ingestion relationships among the three biota components should be addressed. The arrow between biota and ingestion should be pointed to ingestion only.

7 2 4 1 7 1 5 6 2

17. Deficiency/Recommendation: Table 3-13, page WP3T-13

The footnote for this table refers to the sample locations in Figure 3-8. It should instead refer to Figure 3-6, page WP3F-6.

18. Deficiency/Recommendation: Table 3-14, page WP3T-14

The footnote for this table refers to Figure 3-8 for sampling locations. Figure 3-8 shows terrestrial fauna sampling stations. The footnote should reference the appropriate figure.

19. Deficiency/Recommendation: Table 3-16, page WP3T-16

The footnote refers to the terrestrial fauna sampling stations in Figure 3-9. The footnote should refer to Figure 3-8.

20. Deficiency: Table 3-20, page WP3T-20

This table presents a preliminary list of contaminants of interest for the 100-KR-1 Operable Unit. It does not list all of the chemicals that are identified as waste constituents in Table 3-18, page WP3T-18. There are no details given to describe the elimination process used to arrive at the preliminary list of contaminants of interest.

Recommendation:

The document should provide detailed information on the process by which several of the substances shown in Table 3-18 were eliminated from the preliminary list of contaminants of interest.

21. Deficiency/Recommendation: Section 4.1, page WP4-1

This section refers to threshold concentrations without discussing their selection, calculation, or threshold concentration values chosen. The method for determining threshold concentrations as well as their values should be provided.

22. Deficiency/Recommendation: Section 4.1.2.1, page WP4-6

The text refers to information on the nature and extent of contamination of biota adjacent to and in the vicinity of the 100-B/C Area. Instead, the text should refer to the 100-K Area.

22124171563

23. Deficiency: Section 4.1.2.1, WP 4-6

The data needed for "An understanding of the relationship between water-table fluctuations and release and transport of contaminants from the lower vadose zone and capillary fringe to ground water" is described as being derived from 100 Area aggregate investigations. The collection of this data is not explicitly described in milestone M-30, and we know of no other 100 Area aggregate investigation that would address this issue.

Recommendation:

Providing data to evaluate the release of contaminants to ground water as a result of fluctuating water levels should fall within the scope of the 100-KR-4 operable unit RI/FS and should be noted as such here and in the 100-KR-4 work plan.

24. Deficiency: Section 4.1.2.2, WP 4-6

It is noted that determining the nature and vertical extent of contamination in the vadose zone should be sufficient for conducting a qualitative risk assessment at individual waste sites. This information may indicate what contaminants are present, but provides little guidance on potential future exposures. At a minimum, at least semiquantitative information on infiltration rates, soil hydraulic characteristics, and contaminant transport characteristics, will be required for a qualitative risk assessment. For this reason, a 100-Area-wide physical properties strategy was developed.

Recommendation:

In Section 4.1.2.2, note that information on contaminant transport characteristics will also be required for a qualitative risk assessment.

25. Deficiency/Recommendation: Section 4.1.2.2, WP 4-6

It is stated here that "IRM's are initially anticipated at the high priority waste sources and for environmental media found to exceed threshold concentrations." Because this is a source-operable unit and ARAR's for soils are very limited, we do not understand what is meant by "threshold concentrations." What exactly constitutes a threshold concentration and how will it be determined?

26. Deficiency: Section 4.1.2.3, page WP4-7, first bullet

The nature and vertical extent of contamination are identified as the data needed for developing and evaluating IRMs and developing the IRM

2124171664

record of decision. Until an IRM is selected and agreed to by all parties involved, the lateral or areal extent of contamination should also be included as a data need.

Recommendation:

The word "vertical" should be removed from the first bullet.

27. Deficiency/Recommendation: Section 4.2.1.2.1, page WP4-11

The first paragraph indicates that the 116-K-1 crib is not a high-priority site. However, the letter report (DOE 1991) states that the crib is a high-priority site. The text should be corrected.

28. Deficiency/Recommendation: Section 4.2.1.2.1, page WP4-11

The text states that data from 100 Area analogous facilities will be applied toward remediation of 116-K-3 outfall structures and effluent discharge pipelines and valves. These analogous facilities should be individually identified.

29. Deficiency/Recommendation: Section 4.2.2, page WP4-12

This section lacks the source remediation sampling and analysis information specified in the letter report (DOE 1991, page 10, third paragraph). The text should include this information.

30. Deficiency/Recommendation: Section 4.2.2.1, page WP4-12

The second paragraph does not accurately reflect the sampling and analysis procedures that are outlined in the letter report (DOE 1991, page 10, fourth paragraph). The text should be corrected.

31. Deficiency/Recommendation: Table 4-1, WP 4T-1a

In addition to the vadose-zone data presented here, the moisture retention relationship (soil characteristic curves of moisture content versus matric potential) will also be a data need. This information should be supplied from the 100 Aggregate Area Study of soil physical properties described in Attachment 1 of this work plan.

32. Deficiency/Recommendation: Table 4-1, page WP4T-1a

"Feasibility study" should replace "corrective measures study" in the last two columns.

22124171665

33. Deficiency/Recommendation: Table 4-2, page WP4T-2a

This table contains several errors. For the 116-K-1 crib, the pathway should reflect IRMs only. Also, zero boreholes should be indicated instead of one. The approach should follow the procedures described in the letter report (DOE 1991, Table 2-1). In the comments column, number designations for the reactors should be included.

34. Deficiency: Section 5.1.2.3.2, page WP5-6

The text states that no source sampling is currently planned and that analogous information will be reviewed. The letter report (DOE 1991) specifies that only investigations for the 116-K-1 crib and the effluent discharge pipelines and valves would use analogous information.

Recommendation:

Text describing which analogous facilities will be used and how the information will be made available to the regulators.

35. Deficiency/Recommendation: Section 5.1.2.4, page WP5-6

See comment 34.

36. Deficiency: Section 5.1.5, page WP5-7, first paragraph

The vadose zone investigation is described in this section. Until an IRM is selected and agreed to by all parties involved, the investigation should not be limited to vertical contamination.

Recommendation:

The word "vertical" should be removed from the first sentence.

37. Deficiency: Section 5.1.5.2, WP 5-8 (and Table 4-2)

The vadose-zone borings are proposed to be installed to a depth of 5 ft below detectable contamination as determined by field screening. The work plan does not describe how "detectable contamination" will be defined.

Recommendation:

Describe the criteria by which "detectable contamination" will be defined.

72124171656

38. Comment: Section 5.1.5.4, WP 5-10

Because samples for analyses of radionuclides are collected only at 5-ft intervals, we recommend that all vadose-zone bore holes be logged with a gross-gamma tool. These logs will allow us to determine with a high degree of resolution the distribution of gamma-emitting radionuclides with depth below the waste source units.

We also recommend logging existing wells in the vicinity of the liquid waste sites using the spectral gamma tool with the purpose of determining whether contamination of gamma emitting radionuclides exist in the capillary fringe or within the area of the vadose-zone that had been saturated by the ground-water mound that existed when the liquid waste sites were in operation. This will be necessary because very few new wells are to be installed in the vicinity of the KR-1 liquid disposal sites and because vadose-zone bore-hole drilling and sampling may stop well above the water table if contaminants are not detected as the bore hole is advanced. We therefore will have very poor spatial resolution with respect to potential residual contamination from the historic ground-water mound. Spectral gamma logging of existing bore holes will provide a cost effective reconnaissance technique to investigate this issue.

39. Deficiency/Recommendation: Section 5.1.8, page WP5-13

The title of Appendix D-2 in the 100-KR-4 work plan should be included in the text.

40. Deficiency/Recommendation: Section 5.1.9.1, page WP5-14

The title of Appendix D-3 in the 100-KR-4 work plan should be included in the text.

41. Deficiency/Recommendation: Section 5.1.11, page WP5-14

The second paragraph states, "Both the qualitative and baseline risk assessments will be developed in accordance with EPA (1989a) . . ." This reference is for human risk assessment guidance from EPA headquarters. Ecological risk assessment guidance from EPA headquarters, which is already listed in Section 8, References, as EPA 1989b, should also be referenced. In addition, EPA Region 10 risk assessment guidance should be referenced (EPA 1989b, 1991) and included in Section 8.

42. Deficiency/Recommendation: Section 5.1.11.1, page WP5-15

The text states that contaminants selected for the risk assessments are those that are, among other criteria, most mobile and apt to bioaccumulate. However, according to Section 3.3.2.4, page WP3-16 and Section 3.3.2.5, page WP3-17, both mobility and tendency to bioaccumulate have been eliminated as criteria for establishing a preliminary list of contaminants of interest. This inconsistency should be addressed and the text changed where appropriate.

43. Deficiency: Section 5.1.11.3, page WP5-16

Toxicity assessment criteria listed under this subtask do not include ecological parameters.

Recommendation:

The toxicity assessment criteria should include ecological parameters as discussed in EPA (1989b,c).

44. Deficiency/Recommendation: Section 5.1.11.4, page WP5-16

The text states that "ecological receptors are evaluated based on assessment of appropriate endpoints." The text should include a reference for endpoint identification.

The initial criteria for selecting ecological assessment endpoints and measurement indicators for the risk assessment as addressed by EPA (1989c) are not provided. The text does not adequately establish criteria and fails to select ecological endpoints as well as indicators that could be used to characterize these endpoints.

45. Deficiency: Section 5.1.13, page WP5-17

Until an IRM is selected and agreed to by all parties involved, the investigation should not be limited to vertical contamination.

Recommendation:

The word "vertical" should be removed from the fourth sentence.

46. Deficiency/Recommendation: Section 5.2, pages WP5-17 and WP5-18

This section should include a brief discussion on the purpose of development of an IRM plan to select a remedy without performing a focused feasibility study as shown earlier in Figure 4-2.

22124171668

47. Deficiency: Section 5.2.2, page WP5-18

Although, the text indicates that solid wastes, soil, river sediments, and groundwater will be evaluated in the 100 Area aggregate feasibility study, the scope of work includes tasks only for soils and groundwater.

Recommendation:

The primary tasks for solid wastes and river sediments should also be included in the scope of work for the 100 Area aggregate feasibility study.

48. Deficiency/Recommendation: Section 8.0, page WP8-3

The reference section should include EPA Region 10 risk assessment guidance (EPA 1991).

(The comments that follow on the QAPjP, numbers 49 through 57, are included for completeness. It is expected that they will have already been addressed in accordance with agreements reached on other 100-Area work plans)

49. Deficiency/Recommendation: Appendix A, Section 2.0, page A-2

A brief description of the procedures used to screen environmental samples for total radioactivity and alpha activity should be given, including calibration techniques, calibration frequency, and calibration standards and their sources.

50. Deficiency/Recommendation: Appendix A, Section 3.0, pages A-4 to A-7

Table QAPjP-1 refers to Test Methods for Evaluating Solid Waste (EPA 1986) when presenting target quantitation limits. Distinctions between target quantitation limits and the estimated quantitation limits specified by EPA (1986) should be addressed.

51. Deficiency/Recommendation: Appendix A, Section 3.0, pages A-4 to A-7

Table QAPjP-1 should provide a column for experimental conditions.

52. Deficiency/Recommendation: Appendix A, Section 6.0, page A-13

Calibration procedures for each measurement system, calibration frequency, and calibration standards and their sources should be identified.

- 7 2 1 2 4 1 7 1 6 7 0
53. Deficiency/Recommendation: Appendix A, Section 7.0, page A-13  
For each analytical procedure to be used, a brief description of the procedure and measurement objectives should be included.
54. Deficiency/Recommendation: Appendix A, Section 8.2, page A-16  
Provisions should be made for the review of matrix spike duplicate data during validation of radionuclide analyses.
55. Deficiency/Recommendation: Appendix A, Section 8.2, page A-16  
Provisions should be made for receipt of analytical results in hard copy format.
56. Deficiency/Recommendation: Appendix A, Section 12.0, page A-20  
The frequency of routine evaluation of precision and accuracy should be provided.
57. Deficiency/Recommendation: Appendix A, Section 13.0, page A-20  
This section should identify predetermined limits for data acceptability beyond which corrective action is required, procedures for corrective action, and individuals responsible for initiating and approving corrective action.
58. Deficiency/Recommendation: Appendix B, Section 5.0, page B-11  
General occupational health standards for Washington (DLI 1990) should also be listed.

#### REFERENCES

- DLI 1990. General Occupational Health Standards, Chapter 296-62, Part H, Air Contaminants. Division of Industrial Safety and Health, Washington Department of Labor and Industries. December 1990.
- DOE 1991. Letter Report for Rescoped Work Plans for the 100-KR-1 and 100-KR-4 Operable Units. U.S. Department of Energy.
- EPA 1986. Test Methods for Evaluating Solid Waste. SW-846, Third Edition. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency. Washington, D.C.

EPA 1989a. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual Interim Final. EPA/540/1-89/002. U.S. Environmental Protection Agency. December 1989.

EPA 1989b. Statement of Work for the RI/FS Environmental Evaluation for Superfund Sites. U.S. Environmental Protection Agency, Region 10. November 1989.

EPA 1989c. Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, Interim Final. EPA/540/1-89/001. U.S. Environmental Protection Agency. March 1989.

EPA 1991. EPA Region 10 Supplemental Risk Assessment Guidance for Superfund. U.S. Environmental Protection Agency. August 16, 1991.

22124171671

# CORRESPONDENCE DISTRIBUTION COVERSHEET

**Author** D. R. Einan, EPA                      **Addressee** J. D. Goodenough, RL                      **Correspondence No.** Incoming 9200557

**Subject:** RI/FS WORK PLAN FOR THE 100-KR-1 OPERABLE UNIT, HANFORD SITE, RICHLAND, WA, DRAFT D, DATED SEPTEMBER 1991

## INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	X
		M. R. Adams	H4-55	
		L. D. Arnold	B2-35	X
		L. C. Brown	H4-51	
		G. D. Carpenter	B2-16	
		R. E. Day	H4-55	
		C. K. DiSibio	B3-03	
		W. E. Green	H4-55	X
		M. J. Lauterbach	H4-55	X
		R. E. Lerch, Assignee	B2-35	X
		P. J. Mackey	B3-15	
		H. E. McGuire, Level 1	B3-63	
		J. W. Roberts	H4-55	
		T. B. Veneziano	B2-35	
		T. M. Wintczak	L4-92	X
		R. D. Wojtasek	L4-92	
		EDMC	H4-22	X

17087  
 The Work Plan was submitted to RL via 9158062D, 10/29/91. RL submitted the Work Plan to EPA and Ecology via 9105649, 10/30/91. ldp, 6-7049

17218  
18549

7 2 1 2 4 1 7 1 6 7 2