



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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April 25, 1997

Mr. Rich Holten
U.S. Department of Energy
P.O. Box 550
Richland, WA 99352

Dear Mr. Holten:

Re: 100-NR-1 Treatment, Storage, and Disposal Units
Corrective Measures Study/Closure Plan, (DOE/RL-96-39, Draft A)

47178

The Washington State Department of Ecology has reviewed the above referenced document and is providing the enclosed comments. Included, as part of the comment section, are those comments on the document received from the Environmental Protection Agency. The document is well written and will require only minor modifications prior to finalization.

Should you or your staff have questions, please do not hesitate to contact me at (509) 736-3029.

Sincerely,

Handwritten signature of Phillip R. Staats in cursive.

Phillip R. Staats
N Area Project Manager
Nuclear Waste Program

PRS:skr

cc: Doug Sherwood, EPA
Larry Gadbois, EPA
David Olson, USDOE
Mike Thompson, USDOE
Mary Lou Blazek, ODOE
Administrative Record: 100-NR-1, D-1-2, and T-1-2



1) Page ES-2, Waste Unit Descriptions

This section does not currently include narrative describing the hazardous waste constituents discharged to the 116-N-1 and 116-N-3 cribs. Please include text which discusses these discharges.

2) Page ES-5, second paragraph

Please add clarifying text to this paragraph which states that no Contaminants of Concern (COCs) were identified based on the sampling effort which was conducted.

3) Page ES-10, first paragraph

Please revise the first sentence of the paragraph to state that 120-N-1, 120-N-2, and 100-N-58 are on a modified closure pathway. There is a groundwater plume associated with these units which will require monitoring and a remedial alternative decision in the future.

4) Page 1-7, Figure 1-2

Please revise this figure or present a separate figure which includes the sitewide permit modification step which will be taken on these units.

5) Page 2-15, second paragraph

The statement is made that the records do not indicate a discharge of radionuclides to these units. Include text which references the Limited Field Investigation data on these units regarding radionuclides.

6) Page 2-17, second paragraph

The text states that the COPC list does not include all dangerous waste constituents to be evaluated for closure; why not? Which dangerous waste constituents have been omitted? Please include all dangerous waste constituents on the COPC list which will be required during the evaluation for closure of these units.

7) Page 2-19, paragraph 3.a.

Please provide a definition in the text of the term "internally consistent".

8) Page 2-39, Figure 2-28

This figure is not accurate. There is no header box connecting the distribution laterals to the main distribution trough. Please revise the figure.

9) Page 4-2, first sentence

Ecology has not arbitrarily or otherwise agreed to a date of 2010. Please delete this sentence from the document.

10) Page 4-4, fourth paragraph

The text states that since there is no surface soil present at 116-N-1 and 116-N-3, there are no COCs. The remainder of Section 4.3.1.1, titled, Radionuclides in Surface Soils, discusses the samples collected from the surface soils at these units and the COCs found there. Please delete the inconsistent sentence.

11) Page 4-11, last paragraph

The text states that although it is anticipated that pipelines will be encountered during remediation of the 116-N-3 trench, they are not expected to require remediation. On what basis has the assumption been made that the pipelines will not require remediation?

12) Page 6-11, Short Term Effectiveness

A total person-rem exposure number is given based on two hypothetical remediation start dates. Please provide a separate exposure estimate for each disposal unit using the same remediation start dates. Please include text which discusses the assumptions used to derive the exposures including those predicted to be experienced by the MEI.

13) Page 6-7, Short Term Effectiveness

See comment number 12.

14) Page 6-30

Please include a discussion in this chapter of those actions which occur at the 1324-N and 1324-NA facilities.

15) Page 7-2, Short Term Effectiveness

See comment number 12.

16) Page 7-5, Short Term Effectiveness

See comment number 12.

17) Page 7-7, Figure 7-1

Please provide a separate figure for 116-N-1 and 116-N-3.

18) Page A1-2, Section A1.2

Please include a discussion of the modified closure option within this section.

19) Page A1-3, last paragraph

Please revise the text discussing the closure of 1301-N and 1325-N as being clean closures. As the groundwater contamination which resulted from the discharges to these two units will not be remediated in the same timeframe as the proposed remediation of the surface soils (0-15'), clean closure will not be accomplished. What will be accomplished is a modified clean closure with the groundwater remaining an issue of resolution.

20) Page A2-1, Section A2.2.1.2

There is no 100 year floodplain map for this region of the Hanford Reach. Please revise the text accordingly.

21) Page A2-5, Section A2.2.1.5

Please revise the text to reflect the most recent Part A submittal which does not include the waste code U133.

22) Page A3-1, Section A3.2, second paragraph

The text states that an assessment program found no evidence that hazardous waste or hazardous waste constituents from 1301-N had entered the groundwater. This statement does not reflect the hazardous waste contamination which has been detected in the groundwater above MCL or other applicable regulation. This contamination is attributable to the 1301-N unit. Please revise the text to reflect that hazardous waste constituents, most notable of which is chromium VI have been detected in the groundwater under the 1301-N unit.

23) Page A3-5, first paragraph

Please add the following text to this paragraph. It is anticipated that groundwater cleanup will not be achieved to coincide with the remediation of the disposal units. Therefore, modified clean closure will result in a continued groundwater monitoring program until such time as remediation can be accomplished.

24) Page A4-4, second paragraph, last sentence

It is anticipated that verification sampling to determine MTCA direct soil exposure standard compliance will be required. Please revise the text to reflect the need for verification sampling.

25) Page A4-6, last paragraph

A start date for remediation of each disposal unit must be included in the document.

26) Page A4-8, Table A4-1

Please provide a separate duration schedule for 1301-N and 1325-N.

27) Page A5-5, Closure Contact

Please include the title of the official to be contacted on behalf of USDOE in the address.

28) Page A-1-i, Attachments A-1, A-2 and A-3

Please include the fully executed copies of the attachments with the final submittal of this document.

29) Page B1-1, Section B-1

Since there will be groundwater contamination which resulted from the active use of these facilities which will not be remediated to coincide with the action on the surface soil units, clean closure will not be achieved. Please modify the text to reflect a modified closure of these units.

30) Page B1-2 first paragraph last sentence

The text does not reference the section where the reader can find the alternative evaluation, cleanup standard, disposal option or characterization data for this activity. Please revise the text to indicate where this information can be found.

31) Page B1-3, first paragraph, last sentence

Shouldn't the sentence read as follows: If the system structures and piping meet modified clean closure standards after removal...? To state that materials which exceed standards will be buried is not acceptable.

32) Page B4-1, Section B4.1

Please expand the text describing the physical actions to be taken at these units or provide a section within the CMS which accomplishes this, with a reference to it in Section B4-1.

33) Page B4-1, Section B4.2

This section is inadequate for the purpose of a disposal decision to an on-site facility such as ERDF. Please see comment number 30.

34) Page B5-1, Section B5.0

Clean closure of this unit will not be accomplished. This section should be revised to discuss closure under a modified closure scenario. Sulfate is a COC under MTCA.

35) Page B6-1, first paragraph

Thank you for including a start date for these units however the date of October 1, 2010 warrants further discussion and is not acceptable at this time.

36) Page B-1-i, Attachments B-1, B-2, and B-3

See comment number 28.

37) Page D1-1, third paragraph

A volume estimate and associated costs should be provided to account for the potential disposal of pipelines within the 1324N and 1324NA facilities.

38) Page D2-1, first paragraph

Volumes for the 1324N and 1324NA facilities need to be included.

EPA Comments

General Comments

1. The recreational scenario used in this document is not a recreational scenario. It is a potential worker (Park Ranger) scenario. It is deceptive to call it a recreational scenario because people familiar with Hanford cleanup documents (and exposure/risk assessments) equate the recreational scenario with the recreational scenario in HSRAM. This deception is perpetuated by erroneous statements such as:

Page ES-7, 2nd bullet "recreational exposure scenario...using exposure parameters and assumptions in the *Hanford Site Risk Assessment Methodology*".

Page 3-14 to 3-15, Section 3.4.2.2 "protective of human receptors under a recreational exposure scenario...using exposure parameters and assumptions in the HSRAM".

It is also a misnomer based on the general public current concept of recreational use of the Hanford Site. Most people equate recreational use of the Hanford site with recreational boating and fishing/waterfowl hunting along the river corridor. Yet the "recreational scenario" in the subject document excludes consumption of these animals because of the high dose that results from this pathway.

Recommendation: Call the Ranger Scenario a Ranger Scenario, not a recreational scenario and identify it as a type of industrial scenario, or better yet use the standard industrial scenario from HSRAM.

2. The document states that (page 3-7) "Under the rural-residential exposure scenario, groundwater underlying the 100-N Area would not be used as a potable water supply for irrigation purposes for a period of time not expected to exceed 300 years". That is an unprecedented time scale to be considering institutional controls at Hanford, especially away from the 200 Area. That is inconsistent with years of stakeholder advice regarding restoration of beneficial uses of groundwater in the 100 Area. Also, there is no identified viable method for maintaining institutional control for 300 years? EPA's understanding is that Ecology does not support the concept of 300 years of institutional control.

Recommendation: This document should reflect Ecology's position regarding institutional controls, and provide or make clear through reference that an analysis of risk without this extended institutional control has been conducted. The best alternative would be to remove the provision for 300 years of institutional controls.

3. On page 3-6, the document states that "the MTCA C cleanup levels will be the basis for determining remediation requirements under the recreational exposure scenario". The concept of when MTCA C could be used is at WAC 173-340-706, or in a more abbreviated version (sufficient for this discussion) at WAC 173-303-700(3)(c):

Method C: Conditional method. Compliance with cleanup levels developed under the method A or B may be impossible to achieve or may cause greater environmental harm. In those situations, method C cleanup levels for individual hazardous substances may be established on the basis of applicable state and federal laws and a site-specific risk assessment. Method C cleanup levels may also be established at industrial sites... Where a hazardous waste site involves multiple hazardous substances and/or multiple pathways of exposure, method C cleanup levels for individual substances must be modified".

It appears that to entertain use of Method C cleanup levels, there needs to be a reasonable likelihood that:

- (1) Method A or B cleanup levels may be impossible to achieve, which is hard to imagine under the norm for liquid waste sites in the 100 Area -- dig-and-haul.
- (2) That there would be greater environmental harm removing the waste from the highly disturbed footprint of these waste sites vs leaving the waste to continue to

- dose the adjacent environment via the external dose emanating from these sites and release to the Columbia River via continued release to the groundwater.
- (3) That the site-specific risk assessment would justify less remedial action.
 - (4) That despite years of stakeholder input, this area would be designated industrial with associated institutional controls for a very long time.

And lastly, this site does involve multiple hazardous substances with multiple pathways of exposure, so method C cleanup levels for individual substances must be modified (which was not appear to have been done in the subject document).

Recommendation: Do not use Method C cleanup levels.

4. Biased language.

Although better than a lot of Draft A documents we review, there are a number of inappropriate biases in the writing. Several examples are identified in the specific comments below.

Specific Comments

5. Page ES-7, 2nd bullet

The document states that "recreational exposure scenario...using exposure parameters and assumptions in the *Hanford Site Risk Assessment Methodology*". In fact, the document incorrectly (see comment # 18) uses a Park Ranger scenario.

6. Page ES-8, last bullet

The document states "Prevent destruction of...". More accurately, this should be stated as "Minimize destruction of...".

7. Page 2-5, section 2.3

In section 2.3.1, seven categories of information contained in the 100-NR-1/NR-2 CMS are identified, and then sections 2.3.2 through 2.3.2.2 recap some of the information from two of those seven categories but no recap of the information from the other categories is presented. There is no indication why the two categories (geology and hydrogeology) are important to recap, yet the other categories are not. A transition statement into section 2.3.2 is needed.

8. Page 2-8, 1st paragraph, first few sentences.

The document states that "The crib area is approximately...(12 ft) deep"... "The elevation of the bottom of the crib is...(450 ft) above Mean Sea Level (aMSL) and the surrounding grade is approximately...(455 ft) aMSL". This is confusing.

9. Page 2-10, 3rd and 4th paragraphs of Current Site Conditions

Switching of units in the following two statements is confusing: "radiation measurements...were about 300 mrem/hr"... "the background...ranged from 1 to 3 mRoentgen/hour". When appropriate consistent units should be used. (Note: there is a

similar mix of units in the first paragraph of page 2-14. This suggests a global search through the document would be appropriate.)

10. Page 2-10, last full paragraph

The document states that "cobalt and cesium are external exposure concerns". Are they not also contamination concerns? Both this and the next sentence should be reviewed for accuracy.

11. Page 2-11, section 2.4.3, 1st paragraph

Suggest the following change "as a replacement for 116-N-1, which had ~~reached~~ exceeded its disposal capacity".

12. Page 2-17, section 2.5, 1st paragraph

The document states that the "identification of COPCs was accomplished using an approach similar to the COPC screening process developed in the *Hanford Site Risk Assessment Methodology*". Later in section 2.5.1, 2nd paragraph it states that the "COPCs in the 100-NR-1 QRA are those contaminants that exceed an incremental cancer risk (ICR) of 1E-05 or exceed an environmental hazard quotient of one. It is not apparent in the subject document that the approach used in the QRA is 10 to 100 times less conservative than the process identified in the HSRAM. It misleads the reader to state that two processes that are 10 to 100 times different are "similar".

13. Page 2-17, section 2.5, 2nd paragraph

The document states that the "COPC list does not include all the dangerous waste constituents that will be required to be evaluated". OK. This introduces the reader to the idea that there are some *unspecified* number of contaminants that are required to be carried through the full closure process even though they were dropped in a screening process. This prompts the reader to wonder how many and what these contaminants are. The paragraph, without answering the questions it prompted, launches into a discussion of methanol. Is methanol the only contaminant in the category? If so, perhaps rewrite the first sentence as "The COPC list ~~does not include~~ all but one (methanol) of the dangerous...".

The next paragraph begins "the sulfate plume that is present in groundwater...". Is this a continuation of the previous paragraph that discussed methanol, and now the second contaminant is sulfate? This prompts the reader to wonder if sulfate is a dangerous waste under the WAC? Was it a risk driver?

Recommendation: This whole section 2.5 needs a little rework to be more up-front and clear to the reader.

14. Page 2-44, figure 2-23.

The figure title is "General Topography at 116-N-3", yet there is no topo information in this figure. It is a figure of well locations and names.

15. Page 3-5, 4th paragraph

The document states "Thus, for comparative purposes (e.g., to present contaminated soil volume/cost differences between potential land uses and remedial alternatives), a recreational scenario that does not include the food-ingestion exposure pathway is defined in this CMS. This scenario is the most conservative recreational, conceptual exposure model evaluated that does not include the food-ingestion pathway".

See general comment # 1, regarding this so-called "recreational scenario". In fact this is a Park Ranger scenario (had it been calculated correctly) which is more akin to an industrial use exposure scenario. Both of the recreational scenarios within the Columbia River Comprehensive Impact Assessment (where the Park Ranger scenario originated) involve ingestion of food and water from the site. In fact, the two potential land uses evaluated in this CMS are rural-residential and something somewhat akin to industrial. Note too that the CRCIA document calculated risks for the Park Ranger and the standard Industrial worker, and the risks were similar.

"This scenario is the most conservative recreational, conceptual exposure model evaluated". In fact it was the *only* so-called "recreational" scenario evaluated in the CMS. Statements such as "the most conservative" should be removed.

16. Page 3-5, last paragraph

The document states that "for the purpose of the TSD CMS, it is assumed that the groundwater will not be used as a potable water supply or for irrigation purposes, in order to be consistent with the same decision in the 100-NR-1/NR-2 CMS". It is important to note that what 100-NR-1 and 100-NR-2 did is not consistent with the rest of the 100 Area, where the exposure scenarios from HSRAM was used, including the ingestion pathway.

17. Page 3-7, section 3.3.1.3, 1st paragraph

The document states that "The Ranger scenario was selected to represent an individual who spends time in all habitat areas on a regular basis and thus would reflect a median recreationally exposed individual". Note the previous comments about the Ranger scenario as not representative of a recreationally exposed individual. If parameters for a median recreationally exposed individual is desired, the Columbia River Comprehensive Impact Assessment project has defined parameters for an avid and casual recreational user, including ranges on many of the exposure parameters. These would provide a solid foundation on which to interpolate a "median recreationally exposed individual".

18. Page 3-7, last few lines

The document states that the Ranger scenario that should be 150 days per year has been converted to 37.5 days per year. This is immediately a reduction in risk of a factor of 4. This CMS Range scenario is not the Ranger scenario from the CRCIA project, and should not make statements to that effect.

19. Page 3-13 through 3-15

A number of examples of biased language in the risk discussion is evident here. On page 3-13, in discussing the use of 0.1 rad/day for terrestrial animals and 1 rad/day for plants, the document states that "Use of these values for individual receptors within a population is believed to be highly conservative". Does Ecology believe these thresholds are *highly conservative*? In general the individual representatives for the Natural Resource Trustee organizations for the Hanford site do not consider these highly conservative values.

On page 3-15, section 3.4.2.3, 2nd paragraph several additional biased statements are presented. Landeen et al 1993 is cited as a reference for the statement "Field studies at the Hanford Site have found no evidence suggesting impacts to the natural wildlife populations and communities as a result of toxic inorganic contaminants". See the attached letter (EPA letter from L. Gadbois to E. Goller, DOE and J. Donnelly, Ecology dated December 2, 1993) regarding the legitimacy of the 1993 document with regards to conclusions of impact. An example of the bias in the 1993 document was the comparison of contaminants among different media derived from different areas, such as the comparison of raptor scat from the horn area to soil from the 200 area's 2101-M pond -- to determine that lead concentrations were not much different.

The statement "ecological exposure to most inorganic contaminants is expected to be limited because...most metals do not tend to bio-accumulate" applies a sweeping generalization for which there are many exceptions. Such a generalization is inappropriate where there are COPCs which are among the exceptions.